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Navigating the Path to Electric Vehicle Adoption: Assessing the Influence of Consumer Subsidy Awareness and Product Preference on Purchase Readiness

Arlyana Abubakar[1,2], Reska Prasetya[1], Dewa Ayu Komang Bintari Dewi DP[1], Sandra Firda Qonita[1], Usep Suhud[3], Doni Sugianto Sihotang[3]

[1]Bank Indonesia Representative Office, Special Region Province Jakarta, Indonesia
[2]Media Nusantara University, Tangerang, Indonesia
[3]Faculty of Economics, Universitas Negeri Jakarta, Indonesia

Abstracts

Consumer purchase readiness for electric vehicles (EVs) remains an area that needs to be explored in scholarly research. This study investigates the factors influencing consumer readiness to purchase electric motorcycles (EM) and electric cars (EC), including subsidy awareness and vehicle preferences. The study conducted in four cities across Indonesia engaged 1713 participants selected through convenient sampling. Data collection utilised an online questionnaire. The findings hold significance for the automotive industry, particularly electric vehicle manufacturers and governments involved in subsidy allocation. The results reveal that subsidy awareness positively influences preferences for both EM and conventional motorcycles (CM) and readiness to purchase EM and EC. However, contrary to expectations, consumers' preference for EM does not significantly impact their readiness to purchase, highlighting the nuanced dynamics of consumer behaviour. Additionally, while EC preference positively affects readiness to purchase conventional cars (CC), CM preference does not significantly influence EM purchase readiness, suggesting further exploration. These findings contribute to a deeper understanding of consumer behaviour in the context of EV adoption and underscore the importance of subsidy awareness in shaping consumer preferences and purchase readiness. The study's implications extend to policymakers and industry stakeholders, emphasising the potential of targeted interventions to promote EV adoption and sustainable transportation practices.

1. Introduction

The global automotive industry is undergoing a significant transformation driven by the increasing urgency to address environmental concerns and reduce greenhouse gas emissions. One of the pivotal strategies in this transition is the promotion of electric vehicles (EVs) by governments worldwide. Numerous scholarly studies have explored the various policies and initiatives governments implement to support the development and adoption of EVs. Authors such as Lutsey et al. [1], Lane et al. [2], Kester et al. [3], and Hall et al. [4] have extensively examined government policies encompassing regulatory frameworks, consumer incentives,

infrastructure development, and awareness campaigns aimed at fostering the growth of the EV industry. These policies, ranging from tax incentives to infrastructure investments, are crucial in shaping consumer perceptions and market dynamics. For instance, subsidies provided by governments influence consumers' financial considerations and incentivise the adoption of EVs. Additionally, regulatory measures, such as emission standards and vehicle purchase incentives, align industry practices with sustainability goals and accelerate the transition towards electric mobility.

Moreover, the readiness of consumers to embrace EVs is influenced by factors such as subsidy awareness and electric vehicle preference. Scholars like Maghfiroh et al. [5] and Arli et al. [6] have examined consumer readiness within environmental consciousness and preferences for sustainable transportation options. Understanding the interplay between government policies, consumer attitudes, and market dynamics is essential for formulating effective strategies to promote EV adoption and achieve broader sustainability objectives.

While previous research has provided valuable insights into the individual components of government policies and consumer behaviours, there remains a need for comprehensive analyses that integrate these factors. This study addresses this gap by examining the impact of subsidy awareness and electric vehicle preference on consumers' purchase readiness. By elucidating the complex relationships between government interventions, consumer attitudes, and purchase intentions, this research seeks to inform policymakers, industry stakeholders, and academics about practical approaches to accelerate the transition towards electric mobility. Considering the diverse perspectives offered by scholars such as Cao et al. [7], Åhman [8], and Veza et al. [9] across various geographical contexts, this study adopts a comparative approach to explore the nuances of government policies and consumer behaviours in different regions. This research aims to systematically analyse existing literature and empirical data to contribute to the scholarly discourse on sustainable transportation and provide practical insights for policymakers and industry practitioners.

2. Literature review

Consumer awareness

Consumer awareness is a fundamental concept that encompasses the level of knowledge, understanding, and consciousness among consumers regarding various topics, including EVs, environmental issues, and government policies. This term has been extensively explored in several studies, shedding light on its significant influence on consumer behaviour, decision-making processes, and market dynamics. In the study by Taylor and Xiao [10], consumer awareness refers to the degree of knowledge or consciousness consumers possess about product benefits. It plays a crucial role in purchase decision-making and can influence marketing strategies and pricing decisions throughout the product distribution chain.

McElgunn [11] examines consumer awareness specifically in the context of electric vehicles (EVs), focusing on consumers' understanding and knowledge of EVs and their impact on global consumer purchasing patterns. The study highlights how consumer awareness about EVs,

including understanding EV technology, environmental benefits, operational cost savings, and government incentives, significantly influences consumer behaviour and purchasing decisions in the global market. In addition, Rotaris et al. [12] delve into consumer awareness regarding environmental issues and their knowledge of Battery Electric Vehicles (BEVs). Consumer awareness in this context encompasses understanding environmental impacts, the benefits of BEVs in reducing greenhouse gas emissions and air pollution, and knowledge of BEV attributes such as purchase price, range, charging costs, and charging time. This awareness influences consumer perceptions of BEVs and ultimately affects their purchasing decisions.

Bautista et al. [13] focus on developing smart charging management systems for electric vehicles but do not directly address consumer awareness. However, other studies underscore the importance of consumer awareness in influencing purchasing decisions, responses to incentives and policies, and consumer engagement in seeking information about electric vehicles. Additionally, Hardman et al. [14] examine consumer awareness regarding plug-in electric vehicles (PEVs), emphasising the importance of increasing consumer knowledge and awareness to achieve ambitious clean vehicle goals in California. Consumer awareness of PEVs can impact purchasing decisions, responses to incentives and policies, and consumer engagement in seeking information about plug-in electric vehicles. Besides, Kitt [15] explores consumer awareness in the context of understanding policies related to electric vehicles in Canada. The study highlights that consumer awareness of EV policies varies, with many respondents unable to accurately identify existing policies in their region. Thus, consumer awareness encompasses knowledge of existing EV policies and the ability to identify them correctly.

Subsidy awareness and consumer preference

Research on the impact of subsidy awareness on consumer preferences remains scarce. However, several relevant studies have been discussed here, suggesting how awareness can influence preferences across different contexts. The study conducted by Junaidi [16] found that consumer awareness positively affects consumer preferences, specifically in the context of Muslim consumers' preferences towards Islamic banks. This indicates that increased awareness can lead to a more favourable disposition towards specific financial services that align with consumers' values and beliefs. Lisiak-Zielińska et al. [17] explored the public awareness of biogas plants and their impact on their investment preferences. The study highlighted that higher education levels play a crucial role in shaping public perceptions of the advantages and disadvantages of biogas plants. This suggests that enhanced awareness and understanding of renewable energy technologies, facilitated by higher education, can influence societal preferences and acceptance towards renewable energy investments.

Moreover, Sivanandan et al. [18] examined how awareness about primary healthcare services affects individual preferences in choosing primary healthcare centres as their first point of care. Factors such as knowledge and attitudes towards healthcare centres, waiting times, and quality of care were also found to impact this decision-making process. This implies that raising awareness about the availability and benefits of primary healthcare services can increase the likelihood of individuals opting for primary healthcare centres for their initial care. Jang and Woo [19] investigated the relationship between awareness and preferences regarding local food in the Gyeongju area. Their findings suggest that higher awareness levels among respondents

about local food significantly influence their preferences for such food, indicating that awareness can indeed shape consumer food choices.

Additionally, Moon et al. [20] found that awareness plays a crucial role in influencing consumer preferences for new movies, suggesting that high levels of awareness can shape the initial consumer preferences for entertainment products. This supports the notion that awareness is a critical step in the consumer preference formation process for entertainment products. Blanc et al. [21] studied the impact of awareness on consumer preferences for fresh beef, focusing on animal welfare responsibility. The research indicates that consumer awareness of animal welfare standards is significant in meat selection processes, especially among women. This awareness can influence consumer choices towards more animal-friendly meat products, highlighting the role of awareness in ethical consumerism. Patil [22] explored the relationship between brand awareness and preference across sixteen FMCG brands. The findings from the Chi-square test revealed a positive relationship between high brand awareness and higher brand preference, confirming that awareness influences preference within this research context.

Subsidy awareness and purchase readiness

Braimah's [23] study found that awareness of green brands does not directly influence consumers' daily purchasing decisions. Despite respondents being aware of environmental issues related to green brands, this awareness does not directly affect their daily purchasing decisions. Other factors such as price, brand name, and convenience influence respondents' purchasing decisions more than environmental concerns. In the study of Hoyer and Brown [24], it was concluded that brand awareness significantly influences consumer purchasing. Research results indicate that brand awareness can be a dominant heuristic in consumer selection. Subjects with brand awareness tend to try fewer brands and significantly choose high-quality brands in the final selection compared to those without brand awareness. Therefore, brand awareness can influence consumer choices, especially when quality differs among competing brands.

Furthermore, Okada et al. [25] state that environmental awareness directly influences the purchase intention of non-electric vehicle (EV) users in Japan. Environmental awareness also indirectly affects the post-purchase satisfaction of EV users. Therefore, environmental awareness influences purchasing behaviour and consumer satisfaction related to electric vehicles. In Khuong and Tram's [26] article, brand awareness significantly influences purchase decisions. The study shows a significant correlation between brand awareness and other independent variables. Therefore, to achieve significant brand awareness, company marketing managers should pay attention to and focus on emotional marketing.

In addition, Lee and Shin [27] mentioned a positive relationship between consumer awareness of CSR activities and purchase intentions. The analysis results show a positive relationship between consumer awareness of CSR activities and purchase intentions. This indicates that the higher the consumer awareness of a company's CSR activities, the greater the likelihood they intend to purchase products from that company. Hutter et al. [28] stated that brand awareness positively and significantly influences purchase intention. Brand awareness is one factor that influences consumer decision-making processes and can increase the likelihood of the brand being considered when consumers make purchasing decisions. Sivaram et al.'s [29] article

mentions that brand awareness significantly influences purchase decisions. Research results show that brand awareness significantly influences purchase decisions, as seen from the higher value of the t statistic compared to the critical t-value and the smaller probability value than the determined critical value.

Grounded in the findings from previous research, the following hypotheses are proposed for investigation:

H1 – Subsidy awareness will have a significant impact on EV preference.

H2 – Subsidy awareness will have a significant impact on CV preference.

H3 – Subsidy awareness will have a significant impact on purchase readiness.

Consumer preference

As highlighted in several studies, consumer preferences play a crucial role in shaping the landscape of electric vehicle (EV) adoption. Ščasný et al. [30] emphasise how purchase price, operating costs, range, charging time, charging infrastructure availability, and policy incentives influence consumer preferences for EVs in Poland. Despite efforts to promote EV adoption, consumer preferences tend to favour conventional vehicles. Similarly, Al-Obaidi et al. [31] stress the significance of consumer preferences in managing EV charging and battery discharging processes, integrating user preferences, such as maximising benefits or minimising costs, into scheduling to provide personal control to EV users. Bansal et al. [32] elaborate on consumer preferences within EVs, encompassing product attributes, services, policies, and psychological factors like environmental concerns and symbolic attributes. They underline the multifaceted nature of consumer preferences and their impact on EV adoption.

Furthermore, Huang et al. [33] focus on consumer preferences for EVs in China, influenced by functional aspects of the vehicle, perceptions of psychosocial benefits, aspirations for future EV-based mobility, and generational and locational factors. Understanding these preferences is crucial for developing the EV market and crafting effective marketing strategies in China. Saeed et al. [34] highlight consumer preferences regarding autonomous vehicles, influenced by factors like safety, comfort, cost, driving freedom, and other considerations shaping the choice between autonomous and conventional vehicles.

Rommel and Sagebiel [35] emphasise the role of factors like range, charging infrastructure, and price in influencing consumer preferences towards alternative mobility solutions. They underscore the need for a deeper understanding of consumer preferences to tailor mobility products and services accordingly. In addition, Guerra [36] examines consumer preferences for electric motorcycles, showing that price parity with petrol motorcycles, adequate speed and range, and short charging times influence consumer choices. Environmental concerns also drive a preference for electric motorcycles.

Moreover, Morton et al. [37] discuss how consumer innovation levels, attitudes towards EV functional performance, and demographic factors like education levels influence consumer preferences for EVs. Higher innovativeness and positive attitudes towards EV features tend to drive EV interest. Li et al. [38] focus on consumer preferences regarding EV incentive policies

in China, encompassing an understanding of existing policies and preferences for specific incentive types. This understanding informs policymakers on designing incentives to encourage EV adoption effectively. Besides, Liao et al. [39] emphasise consumer preferences concerning EVs, considering price, vehicle performance, range, charging infrastructure, and government policies influencing consumer decisions regarding EV usage or purchase. Oliveira et al. [40] discuss consumer preferences concerning vehicle choices, particularly EVs, based on price, range, fuel consumption, CO2 emissions, and potential owner benefits. These preferences affect vehicle purchasing decisions and can be influenced by various factors, including government policies, pricing, and product characteristics.

Furthermore, Ghasri et al. [41] highlight how consumer preferences for EVs are influenced by perceptions of their relative advantages over conventional fuel vehicles in terms of vehicle design, environmental impact, and safety. Factors like price, range, and body design also interact with these perceptions to shape consumer preferences for EVs. Li et al. [38] elaborate on consumer preferences regarding EV incentive policies in China, using conjoint analysis to identify preferences for various incentive policies to promote EV adoption. In addition, Guerra and Daziano [42] discuss how consumer preferences for motor vehicle purchases are influenced by key factors such as selling price, range, parking costs, parking search time, and operational costs. Additionally, findings suggest that consumers choose vehicles based on the purchase price, significantly affecting their decisions. Factors such as hybrid car ownership, marital status, education level, type of residence, age group, and other demographic factors also influence consumer preferences for Evs.

Consumer preference and purchase readiness

Studies examining the impact of subsidies on purchase readiness still need to be explored, highlighting a gap in the existing body of research. Purchase readiness itself is a spectrum of consumer readiness, ranging from an initial lack of desire to buy to repurchase activities potentially occurring multiple times [43].

This study seeks to bridge this gap by examining the influence of subsidies on consumer purchase readiness. In doing so, it draws upon several relevant studies that provide a foundation for understanding the dynamics at play. For example, Boubker and Douayri [44] found that brand preference significantly influences purchase intentions within the dairy product context in Morocco's Laayoune-Sakia El Hamra region, illustrating a positive correlation between brand preference and the intention to purchase. Helveston et al. [45] demonstrated that consumer preferences for electric vehicle attributes significantly affect purchase decisions. Factors such as range, price, charging time, and government subsidy policies were found to influence consumer preferences towards electric vehicles, including hybrid electric vehicles (HEVs), plug-in hybrid electric vehicles (PHEVs), and battery electric vehicles (BEVs). This study underscores the importance of understanding consumer preferences in designing effective marketing strategies and policies to support the adoption of electric vehicles. Additionally, Tandon et al. [46] highlighted the positive influence of preference value on purchase intention within food delivery applications, suggesting that enhancing consumer perceptions of benefits, such as free delivery and access to preferred restaurants, can increase purchase intentions.

Moreover, Dam [47] also found a positive relationship between brand preference and purchase intention, suggesting that marketing programs to enhance brand preference can subsequently increase purchase intentions. In addition, Kabir et al. [48] emphasized the role of consumer preferences in the decision-making process for purchasing vegetables, with factors such as freshness, quality, price, and safety influencing consumer choices. Additionally, socio-demographic characteristics such as education, income, and food expenditure were found to impact price awareness among consumers in Bangladesh. Puriwat and Tripopsakul [49] confirmed that brand preference directly affects consumer purchase intentions, supporting the hypothesis that brand preference directly impacts buying behaviour.

Building upon previous research findings, the following hypotheses are proposed for examination.

H4 – EV preference will have a significant impact on purchase readiness.

H5 – CM preference will have a significant impact on purchase readiness.

In the conceptual framework depicted in Figure 1, subsidy awareness is a pivotal factor influencing various aspects of electric vehicle (EV) adoption readiness. Specifically, it is linked to both EV preference and conventional vehicle (CV) preference and EV purchase readiness. This framework underscores the significance of subsidy awareness in shaping consumer attitudes and intentions towards electric vehicles.

The electric vehicle category is further segmented into electric motorcycles and conventional vehicles during hypothesis testing. This categorisation allows for a more nuanced examination of the factors influencing different electric vehicle adoption readiness types. By dissecting the electric vehicle market into distinct segments, researchers can gain deeper insights into the dynamics and better inform strategies to promote EV adoption.

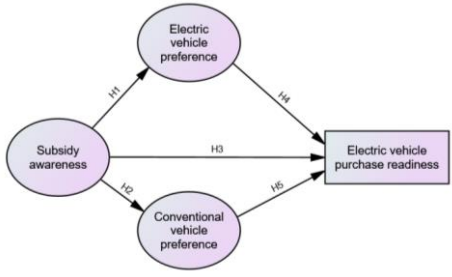

Figure 1. Theoretical framework of the electric vehicle purchase readiness

3. Methods

Measures

We conducted a preliminary study to qualitatively explore information to construct quantitative indicators. Our open-ended questions were tailored to address subsidy awareness, electric

motorcycle preference, electric car preference, conventional motorcycle preference, and conventional car preference. These questions were compiled into an online questionnaire and distributed to potential participants. The collected responses were categorised based on similarities and subsequently adapted into quantitative indicators. In this manuscript, we do not present the results of the qualitative study. However, the data validity testing results show that the outcomes are evident, as almost all indicators were deemed valid. Some subsidy awareness indicators were like findings from Li (2020) and Lu (2021) studies, while some preference indicators were akin to those in Cun (2023) and Cin (2022) studies. In addition, we adapted indicators measuring electric motorcycle purchase readiness and electric car purchase readiness from Suhud (2013). There is one indicator with six stages of readiness.

Data analysis methods

Quantitative data in this study underwent four stages of analysis. Firstly, validity testing was conducted using SPSS version 29 software. An indicator was deemed valid if it exhibited a factor loading of 0.4 or higher, indicating a strong association with its underlying construct. This initial step ensured that the measurement instruments accurately captured the intended concepts within the study. Subsequently, data reliability was assessed through Cronbach's alpha values, which were also analysed using SPSS version 29. Constructs were considered reliable if they achieved a Cronbach's alpha score of 0.7 or above. This step aimed to ensure the internal consistency of the measurement instruments and the reliability of the data collected. The third stage involved a secondary validity assessment using confirmatory factor analysis (CFA), which was conducted using AMOS version 29 software. CFA further validated the measurement model by examining the relationships between observed variables and their respective latent constructs. This rigorous analysis helped confirm the robustness of the measurement model and the validity of the constructs under investigation. Finally, hypothesis testing was performed using structural equation modelling (SEM) and AMOS version 29 software. Hypotheses were supported if they attained a critical ratio (CR) value of 1.96 or higher, indicating statistical significance. SEM allowed for the simultaneous examination of multiple relationships within the proposed theoretical framework, providing insights into the complex interplay between variables.

Both exploratory factor analysis (EFA) and SEM analyses were conducted following predefined criteria outlined in Table 1. The criteria encompassed various fit measures, including probability values, chi-square to degrees of freedom ratio (X2/DF), comparative fit index (CFI), and root mean square error of approximation (RMSEA). Adhering to these criteria ensured that the fitted models adequately represented the observed data and provided a robust basis for drawing valid conclusions from the study findings.

Table 1. Criteria of a fitted model

Criteria	Rule of thumb	Resources
Probability	$0.05 < p < 1.00$	Schermelleh-Engel et al. [50]
CMIN/DF	$0 \leq \text{CMIN/DF} \leq 2$	Tabachnick et al. [51]
CFI	$0.95 \leq \text{CFI} \leq 1.00$	Hu and Bentler [52]
RMSEA	$0 \leq \text{RMSEA} \leq 0.06$	Hu and Bentler [53]

4. Results

Participants

The participants in this study were aged at least 22 years old and had a minimum monthly income of USD 450 (or combined with the partner). They were selected using convenient sampling methods. The profile of the participants is presented in Table 2. Out of the total 1713 participants, 46.4% were male, and 53.6% were female. Regarding occupational status, the majority (76.7%) were employed, while 20.3% owned their own businesses, 0.2% were retired, and 2.9% were unemployed. In terms of age distribution, the largest proportion (50.4%) fell within the 22-27 age range, followed by 27.1% in the 28-33 age range, 16.9% in the 34-39 age range, and smaller percentages in older age brackets. The level of education completed varied, with 58.6% having completed a Bachelor's degree, 18.2% having completed a Diploma 1-3, 14.7% having completed high school, and smaller percentages with other educational backgrounds. Regarding marital status, 45.2% were unmarried, 53.6% were married, and the remaining participants were either separated/divorced or widowed.

Table 2. Profile of participants

Profile		Frequency	Percent
Valid	Male	794	46.4
	Female	919	53.6
	Total	1713	100.0
Occupational Status	Employed	1314	76.7
	Self-employed	347	20.3
	Retired	3	0.2
	Unemployed	49	2.9
Valid	>59	4	0.2
	22-27	864	50.4
	28-33	464	27.1
	34-39	289	16.9
	40-45	70	4.1
	46-51	18	1.1
	52-59	4	0.2
Level of Education Has Been Completed	Diploma 1-3	311	18.2
	Less than high school	32	1.9
	Postgraduate	115	6.7
	Undergraduate	1003	58.6
	High school	252	14.7

Marital status	Unmarried	774	45.2
	Separated/divorced	14	0.8
	Married	918	53.6
	Widowed	7	0.4

Data validity and reliability tests

Subsidy awareness

Table 3 presents the results of data validity and reliability tests for subsidy awareness. Indicator Ins5 ("Reduction in tax payments for purchasing electric vehicles") exhibits the highest factor loading of 0.909, indicating a robust correlation with subsidy awareness. This is closely followed by indicators Ins7 ("Exemption from paying tax on purchasing electric vehicles") and Ins4 ("Duty-Free Transfer of Motor Vehicle Title"), with factor loadings of 0.908 and 0.903, respectively. Additionally, Cronbach's Alpha coefficient for subsidy awareness is reported as 0.965, indicating excellent internal consistency among the indicators.

Table 3. Results of data validity and reliability tests for subsidy awareness

	Indicators	Factor Loadings	Cronbach's Alpha
Ins5	Reduction in tax payments for purchasing electric vehicles.	0.909	0.965
Ins7	Exemption from paying tax on purchasing electric vehicles.	0.908	
Ins4	Duty Free Transfer of Motor Vehicle Title (BBNKB).	0.903	
Ins9	Exemption from paying annual vehicle tax.	0.901	
Ins2	Reduction of annual vehicle tax payments for a certain period.	0.898	
Ins3	Monthly electricity payment subsidy.	0.885	
Ins6	Reduction in tax payments for purchasing vehicle batteries.	0.878	
Ins8	Free battery delivery.	0.875	
Ins1	Purchase subsidies so prices are cheaper.	0.862	

Preference for conventional motorcycle

Table 4 presents the results of data validity and reliability tests for conventional motorcycle preference. Notably, indicator Psk7 ("Conventional motorbikes are more flexible") exhibits the highest factor loading of 0.864, indicating a robust correlation with conventional motorcycle preference. This is closely followed by indicators Psk11 ("Conventional motorbikes are more practical to use") and Psk8 ("Conventional motorbikes are easier/simpler to use"), with factor loadings of 0.860 and 0.847, respectively. Additionally, the Cronbach's Alpha coefficient for conventional motorcycle preference is reported as 0.957, indicating excellent internal consistency among the indicators.

Table 4. Results of data validity and reliability tests for conventional motorcycle preference

	Indicators	Factor Loadings	Cronbach's Alpha
Psk7	Conventional motorbikes are more flexible.	0.864	0.957
Psk11	Conventional motorbikes are more practical to use.	0.860	
Psk8	Conventional motorbikes are easier/simpler to use.	0.847	
Psk4	Already used to conventional motorbikes.	0.847	
Psk3	Conventional motorbikes are more comfortable to use.	0.844	
Psk13	Already familiar with conventional motorbikes.	0.841	
Psk6	Infrastructure for conventional motorbikes is adequate.	0.837	
Psk10	Conventional motorbikes are more efficient.	0.829	
Psk5	Conventional motorbike for long trips.	0.821	
Psk9	Not yet used to using an electric motorbike.	0.803	
Psk1	Access to refuel conventional motorbikes is easier.	0.796	
Psk2	The purchase price of a conventional motorbike is cheaper/affordable.	0.731	
Psk12	Love the feel of the engine and the sound.	0.704	

Preference for electric motorcycle

Table 6 displays the results of data validity and reliability tests for preference of electric motorcycles. Notably, indicator Psl9 ("Electric motorbikes are more comfortable to use") exhibits the highest factor loading of .919, indicating a robust correlation with the preference for electric motorcycles. This is closely followed by indicators Psl6 ("Electric motorbikes are more practical to use") and Psl13 ("Electric motorbikes follow the electric vehicle trend"), with factor loadings of .911 and .904, respectively. Moreover, Cronbach's Alpha coefficient for the preference for electric motorcycles is reported as 0.980, indicating excellent internal consistency among the indicators.

Table 6. Results of data validity and reliability tests for preference of electric motorcycle

	Indicators	Factor Loadings	Cronbach's Alpha
Psl9	Electric motorbikes are more comfortable to use.	0.919	0.980
Psl6	Electric motorbikes are more practical to use.	0.911	
Psl13	Electric motorbikes follow the electric vehicle trend.	0.904	
Psl8	All-sophisticated/modern electric motorbike.	0.903	
Psl5	Electric motorbikes are easier/simpler to use.	0.902	
Psl14	Electric motorbikes are quiet/noisy.	0.897	
Psl7	Electric motorbikes are more efficient.	0.896	

Psl11	Electric motorbikes can reduce carbon emissions.	0.892
Psl12	Electric motorbikes are more comfortable to use.	0.890
Psl17	Electric motorbikes are better/cooler.	0.887
Psl2	Electric motorbikes save fuel on petrol.	0.876
Psl4	Want to try an electric motorbike?	0.875
Psl1	Electric motorbikes are more environmentally friendly.	0.860
Psl18	The operating costs of electric motorbikes are cheaper/affordable.	0.833
Psl19	Cheap/affordable maintenance costs for electric motorbikes. Electric motorbikes are more attractive.	0.809
Psl10	Access to refuel electric motorbikes is easier.	0.795
Psl15	Access to refuel conventional motorbikes is easier.	0.791
Psl16	The purchase price of an electric motorbike is cheaper/affordable.	0.774

Preference for conventional car

Table 5 presents the results of data validity and reliability tests for preference of conventional cars. Among the indicators, Pmk4 ("Already accustomed to conventional motorcycles") demonstrates the highest factor loading of .907, indicating a robust correlation with the preference for conventional cars. This is followed closely by indicators Pmk5 ("Conventional motorcycles for long-distance travel") and Pmk6 ("Infrastructure for conventional motorcycles is already adequate"), both with factor loadings of 0.891 and 0.887, respectively. Additionally, Cronbach's Alpha coefficient for the preference for conventional cars is reported as 0.969, signifying excellent internal consistency among the indicators.

Table 5. Results of data validity and reliability tests for preference of conventional car

	Indicators	Factor Loadings	Cronbach's Alpha
Pmk4	Already used to conventional motorcycles.	0.907	0.969
Pmk5	Conventional motorcycle for long trips.	0.891	
Pmk6	Infrastructure for conventional motorcycles is adequate.	0.887	
Pmk8	Conventional motorcycles are easier/simpler to use.	0.884	
Pmk7	Conventional motorcycles are more flexible.	0.883	
Pmk3	Conventional motorcycles are more comfortable to use.	0.873	
Pmk13	Already familiar with conventional motorcycles.	0.870	
Pmk1	Access to refuel conventional motorcycles is easier.	0.850	
Pmk9	Not yet used to using an electric motorcycle.	0.847	
Pmk11	Conventional motorcycles are more practical to use.	0.843	
Pmk10	Conventional motorcycles are more efficient.	0.831	

Pmk2	The purchase price of a conventional motorcycle is cheaper/affordable.	0.827
Pmk12	Love the feel of the engine and the sound.	0.740

Preference for electric car

Table 6 presents the results of data validity and reliability tests for preference of electric cars. The table includes indicators, factor loadings, and Cronbach's Alpha coefficients, providing insights into the validity and reliability of the data regarding respondents' preferences for electric cars. Higher factor loadings suggest stronger associations between the indicators and the construct. Among the indicators, Pml3 ("Electric cars can reduce pollution") demonstrates the highest factor loading of 0.890, indicating a strong correlation with the preference for electric cars. This is followed closely by indicators Pml8 ("Electric car is trendy/current") and Pml4 ("The electric car has a cool/new design"), both with factor loadings of 0.881. Furthermore, Cronbach's Alpha coefficient for the preference for electric cars is reported as 0.967, indicating excellent internal consistency among the indicators.

Table 6. Results of data validity and reliability tests for preference of electric car

	Indicators	Factor Loadings	Cronbach's Alpha
Pml3	Electric cars can reduce pollution.	0.890	0.967
Pml8	Trendy/current electric cars.	0.881	
Pml4	The electric car has a cool/new design.	0.881	
Pml7	Advanced/modern/innovative technology electric cars.	0.876	
Pml5	Electric cars are curious to try.	0.871	
Pml6	Electric cars are easier to use.	0.869	
Pml9	Electric cars reduce carbon gas emissions.	0.868	
Pml2	Environmentally friendly electric cars.	0.866	
Pml1	Fuel efficient/efficient electric cars.	0.850	
Pml3	Electric cars sound smooth/quiet.	0.837	
Pml10	Electric cars electric cars are more practical.	0.835	
Pml11	Electric cars can pass through odd-even areas.	0.807	
Pml12	Electric cars are cheaper to maintain.	0.713	

Purchase readiness of electric vehicle

Table 7 presents the results of the Electric Vehicle (EV) Purchase Readiness frequency. The table categorises respondents based on their readiness to purchase electric vehicles, including electric motorcycles and cars. Regarding Electric Motorcycle purchase readiness, the highest frequency is observed among respondents considering buying an electric motorcycle, constituting 44.5% of the total respondents. This is followed by respondents who plan to buy an electric motorcycle in the next three years, comprising 27.8% of the total. For Electric Car

purchase readiness, most respondents are also considering buying an electric car, representing 41.3% of the total respondents. This is followed by those who plan to buy an electric car in the next three years, accounting for 32.7% of the total.

Moreover, A smaller percentage of respondents indicated that they are ready to buy an electric vehicle, with 2.5% ready for an electric motorcycle and 2.2% ready for an electric car. Additionally, a notable portion of respondents expressed no intention of purchasing an electric vehicle, with 15.4% for electric motorcycles and 17.9% for electric cars.

Table 7. Results of electric vehicle purchase readiness frequency

No	Purchase Readiness of Electric Vehicle	Electric Motorcycle		Electric Car	
		Frequency	Percent	Frequency	Percent
1	I currently bought an electric vehicle.	56	3.3	26	1.5
2	I'm currently considering buying an electric vehicle.	762	44.5	708	41.3
3	Currently, I am ready to buy an electric vehicle.	42	2.5	38	2.2
4	Currently, I have bought an electric motorcycle and plan to buy another electric vehicle.	48	2.8	22	1.3
5	I plan to buy an electric vehicle in the next three years.	477	27.8	561	32.7
6	I've bought an electric vehicle before.	64	3.7	52	3.0
7	I never thought about buying an electric vehicle.	264	15.4	306	17.9
	Total	1713	100.0	1713	100.0

Hypotheses testing

The structural model for electric motorcycle purchase readiness, as shown in Figure 2, achieved an acceptable level of fit with the data following adjustments recommended by AMOS. This adaptation involved linking EM preference directly to CM preference or vice versa, which was a critical step in refining the model's accuracy. After implementing this experimental change, the model demonstrated a satisfactory alignment with the collected data, evidenced by statistical indicators: a p-value of 0.064, a CMIN/DF score of 1.499, a CFI of 0.999, and an RMSEA of 0.017. These metrics signify that the adjusted structural model accurately represents the factors influencing electric motorcycle purchase readiness.

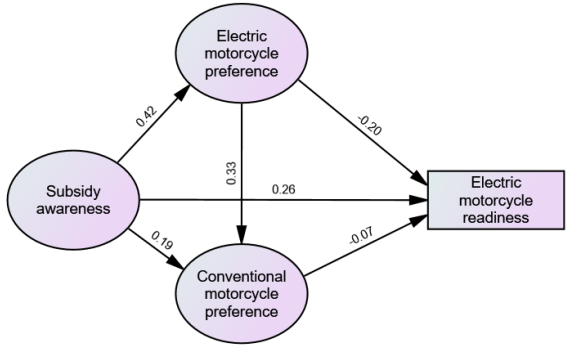

Figure 2. Structural model of electric motorcycle purchase readiness

Table 8 presents the results of hypotheses testing for Electric Motorcycle Purchase Readiness, comprising five hypotheses. Each hypothesis exhibits a CR exceeding 1.96, indicating significant findings. However, hypotheses four and five demonstrate a negative directional tendency.

Table 8. Results of the hypotheses testing for the electric motorcycle purchase readiness

Hypotheses	Paths	C.R.	P	Results
H1	Subsidy awareness > EM preference	15.683	***	Accepted
H2	Subsidy awareness > CM preference	6.808	***	Accepted
H3	Subsidy awareness > EM purchase readiness	9.281	***	Accepted
H4	EM preference > EM purchase readiness	-6.523	***	Rejected
H5	CM preference > EM purchase readiness	-2.574	0.010	Rejected
Additional path	EM preference > CM preference	11.003	***	Accepted

In the second model under consideration, a similar pattern emerged. The structural model's alignment was only achieved after the application of modifications suggested by AMOS, which recommended linking EC preference with CC preference or vice versa. This adjustment led to a model that exhibited an optimal fit. The structural model for electric car purchase readiness, as depicted in Figure 3, achieved a strong fit with the empirical data. This is supported by statistical indicators: a p-value of 0.057, a CMIN/DF ratio of 1.634, a CFI of 0.999, and a RMSEA of 0.019, demonstrating the model's robustness and accurate reflection of the observed phenomena.

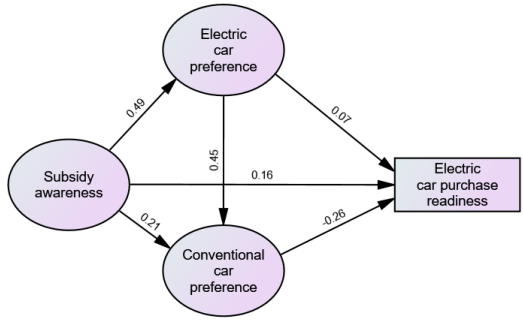

Figure 3. Structural model of the electric car purchase readiness

Similarly, Table 9 showcases the outcomes of hypotheses testing for EC Purchase Readiness, with five hypotheses examined, all yielding CR values above 1.96, suggesting statistical significance. Notably, hypothesis five presents a negative directional tendency.

Table 9. Results of the hypotheses testing for the electric car purchase readiness

Hypotheses	Paths	C.R.	P	Results
H1	Subsidy awareness > EC preference	17.887	***	Accepted
H2	Subsidy awareness > CC preference	7.681	***	Accepted
H3	Subsidy awareness > EC purchase readiness	5.201	***	Accepted
H4	EC preference > EC purchase readiness	2.082	0.037	Accepted
H5	CC preference > EC purchase readiness	-7.924	***	Rejected
Additional path	EC preference > CC preference	16.207	***	Accepted

5. Discussion

The study's findings reveal significant insights into the factors influencing consumer readiness to purchase electric vehicles (EVs), including motorcycles and cars. The study specifically examines the impact of subsidy awareness on EV preferences, providing valuable contributions to understanding consumer behaviour in the context of sustainable transportation choices. The results indicate that subsidy awareness exerts a significant positive influence on EV preferences across different categories, namely EM, CM, EC, and CC preferences. This implies that consumers who are more aware of subsidies available for EVs are more inclined to prefer electric vehicles over conventional ones. The acceptance of these hypotheses can be attributed to several factors. Firstly, subsidy awareness is a crucial informational cue informing consumers about the financial incentives available for purchasing EVs, making electric vehicles more economically attractive than their conventional counterparts. This aligns with the findings of previous studies such as Jang and Woo (2015), Moon et al. (2016), Lisiak-Zielińska et al. (2023), and Sivanandan

et al. (2020), which have demonstrated the positive impact of awareness on consumer preferences in various contexts.

Furthermore, the positive influence of subsidy awareness on EV preferences may also be attributed to the perceived environmental benefits associated with electric vehicles. Consumers who are aware of subsidies for EVs may perceive them as more environmentally friendly options due to lower emissions and reduced dependence on fossil fuels. This aligns with the growing global emphasis on sustainability and the increasing demand for eco-friendly transportation solutions. The acceptance of the hypotheses regarding the significant positive influence of subsidy awareness on electric motorcycle (EM) and electric car (EC) purchase readiness can be attributed to several factors supported by previous research findings. Firstly, Sivaram et al. (2019), Hoyer and Brown (1990), Okada et al. (2019), and Khuong and Tram (2015) have provided evidence suggesting that awareness of subsidies or incentives positively influences consumer behaviour and purchase intentions. These studies have shown that consumers are more inclined to consider purchasing environmentally friendly products such as electric vehicles when they are aware of subsidies or financial incentives. Secondly, the findings align with the theory of reasoned action and planned behaviour, which posits that individuals' attitudes and perceptions towards a behaviour, such as purchasing an electric vehicle, are influenced by subjective norms and perceived behavioural control. Subsidies can act as a facilitator by reducing the perceived financial barriers associated with purchasing electric vehicles, thus positively impacting consumers' readiness to make such purchases.

The significant positive effects observed in the study may also be attributed to the increasing awareness and emphasis on environmental sustainability and the benefits of electric vehicles. As consumers become more informed about the environmental impacts of traditional combustion engine vehicles and the advantages of electric vehicles, they may be more receptive to purchasing them, especially when financial incentives are available.

This study delves into the determinants that influence consumer readiness to purchase EVs, encompassing both EMs and ECs. A pivotal aspect of this research was examining the impact of EV preference on the readiness to purchase these vehicles (EV purchase readiness). Contrary to expectations, the findings reveal a significant negative impact of EM preference on EM purchase readiness, with a CR score of -6.523, leading to the rejection of the hypothesis. Similarly, CM preference was found to have a significant negative effect on EM purchase readiness, with a CR score of -2.574. Additionally, CC preference significantly negatively influenced EC purchase readiness, evidenced by a CR score of -7.924. These outcomes starkly contrast with the positive associations anticipated and previously reported in the literature by Boubker and Douayri (2020), Helveston et al. (2015), and Tandon et al. (2021), necessitating rejection of these hypotheses as well.

On a different note, EC preference was observed to affect EC purchase readiness significantly positively, with a CR score of 2.082, validating this hypothesis. This finding aligns with the supportive evidence from earlier research by Boubker and Douayri (2020), Helveston et al. (2015), and Tandon et al. (2021), suggesting that preferences towards electric cars can indeed foster a greater readiness to purchase them.

These contrasting results underscore a complex relationship between vehicle preferences and purchase readiness, particularly within the context of electric vehicles. The negative influence of preferences for electric motorcycles and conventional vehicles on purchase readiness suggests potential barriers to consumer acceptance or perceived practicality of these vehicles. Conversely, the positive relationship between electric car preferences and purchase readiness highlights a more favourable consumer disposition towards electric cars, possibly reflecting greater confidence in their viability and compatibility with consumer needs.

The divergence from previous findings invites a broader discussion on the evolving dynamics of consumer attitudes towards electric vehicles. It suggests the need for a nuanced understanding of how various factors, including technological advancements, environmental concerns, and societal trends, collectively influence consumer preferences and, subsequently, their purchase decisions. This exploration is crucial for manufacturers, policymakers, and marketers aiming to enhance the adoption of electric vehicles. These necessitating strategies address the identified barriers and leverage the positive predispositions revealed through this study.

Regarding the additional paths, it was initially posited that preferences for EM were not designed to be linked to CM preferences. Similarly, EC preferences were not intended to be associated with CC preferences. However, the study's findings diverge from these initial assumptions, revealing significant relationships upon linking these preferences. Firstly, the study finds that EM preferences significantly influence CM preferences, evidenced by a CR score of 11.003, indicating a significant result. Secondly, EC preferences also significantly affect CC preferences, with a CR score of 16.207, further underlining the significance of these findings.

The significance of these results lies in their contribution to the novelty of the research. They suggest that consumer preferences for electric vehicles are not isolated from those for conventional vehicles. This interlinkage highlights a broader spectrum of consumer behaviour and decision-making processes than previously understood. This phenomenon is not unique to this study. A similar pattern was observed in Suhud's [43] research, which found that tourists' intentions to engage in volunteer tourism over one year significantly influenced their intentions to participate in similar activities over three and five years. This parallel underscore the relevance and significance of understanding the interconnectedness of preferences and intentions in various contexts, marking a significant contribution to the field's understanding of consumer behaviour towards sustainability and choices.

6. Conclusions

In conclusion, the findings of this study provide valuable insights into the factors influencing consumer readiness to purchase electric vehicles (EVs), encompassing both electric motorcycles (EM) and conventional motorcycles (CM), as well as electric cars (EC) and conventional cars (CC).

The acceptance of hypotheses regarding the positive influence of subsidy awareness on EM and CM preferences, as well as EM readiness, underscores the significant role of government subsidies and incentives in shaping consumer preferences and encouraging the adoption of

electric vehicles. However, the rejection of the hypothesis suggesting a direct impact of EM preference on EM readiness highlights the complexity of factors influencing consumers' readiness to purchase electric motorcycles.

Similarly, the acceptance of hypotheses indicating the positive impact of subsidy awareness on EC and CC preferences, as well as EC purchase readiness, reinforces the importance of subsidy awareness in shaping consumer preferences across electric and conventional vehicle options. Additionally, the positive influence of EC preference on EC purchase readiness further emphasises the interplay between preferences and readiness in driving EV adoption.

However, rejecting the hypothesis suggesting a negative impact of CC preference on EC purchase readiness suggests that conventional motorcycle preferences may not directly impede consumers' readiness to adopt electric motorcycles. The findings of this study contribute significantly to the theoretical understanding of consumer behaviour and decision-making processes regarding the adoption of EVs, encompassing both EM and EC, as well as their conventional counterparts, CM and CC. The acceptance of hypotheses regarding the positive influence of subsidy awareness on EM, CM, EC, and CC preferences underscores the importance of government incentives and subsidies in shaping consumer preferences across different vehicle types. This highlights the significant role that policy interventions can play in stimulating demand for EVs and influencing consumer choices in the transportation market.

Furthermore, the acceptance of hypotheses indicating the positive impact of subsidy awareness on EM and EC purchase readiness demonstrates the critical role of subsidy awareness in enhancing consumers' preparedness to purchase electric vehicles. Increasing awareness of subsidies and incentives can effectively encourage consumers to overcome barriers and embrace electric vehicle adoption. However, the rejection of the hypothesis suggesting a direct impact of CM preference on EM readiness indicates a more complex relationship between preferences and readiness in the context of electric motorcycle adoption. This highlights the need for further research to explore the underlying mechanisms and factors influencing consumers' readiness to adopt electric motorcycles beyond their preferences for conventional motorcycles.

The findings of this study hold significant managerial implications for stakeholders involved in promoting and facilitating the adoption of EVs, including EM and EC, as well as their conventional counterparts, CM and CC. The acceptance of hypotheses indicating the positive influence of subsidy awareness on EM, CM, EC, and CC preferences underscores the importance of raising awareness about government incentives and subsidies in shaping consumer preferences across different vehicle types. This suggests that initiatives to increase subsidy awareness can effectively influence consumer choices and preferences towards electric vehicles, thereby stimulating demand in the market.

Moreover, the acceptance of hypotheses demonstrating the positive impact of subsidy awareness on EC and EC purchase readiness highlights the crucial role of subsidy awareness in enhancing consumers' preparedness to purchase electric vehicles. This implies that efforts to educate consumers about subsidies and incentives can play a pivotal role in overcoming barriers to electric vehicle adoption and encouraging consumers to transition towards more sustainable transportation options.

However, the rejection of the hypothesis suggesting a negative impact of CC preference on EC purchase readiness signals the need for a more nuanced approach to understanding the relationship between preferences and readiness in the context of electric vehicle adoption. This indicates that consumer preferences for conventional vehicles may not necessarily hinder their readiness to adopt electric vehicles, suggesting potential opportunities for targeted interventions to promote electric vehicle adoption among consumers with a preference for conventional vehicles.

While this study provides valuable insights into the factors influencing consumer readiness to purchase EVs, including both EM and EC, as well as their conventional counterparts, CM and CC, several limitations should be acknowledged to guide future research in this area. Firstly, the study's focus on subsidy awareness and consumer preferences may overlook other potential influential factors such as infrastructure availability, charging accessibility, and environmental consciousness. Future studies could incorporate a broader range of variables to provide a more comprehensive understanding of EV adoption dynamics and address the complexity of consumer decision-making processes. Secondly, relying on self-reported data from survey respondents may introduce biases, including social desirability bias and recall errors. Employing alternative methodologies such as observational studies or experimental designs could offer more robust and objective insights into consumer behaviour towards EV adoption. The study also examined consumer perceptions and intentions rather than actual purchasing behaviour. Future research could incorporate longitudinal data or behavioural experiments to assess how attitudes translate into real-world purchasing decisions over time.

Furthermore, the study's sample was limited to Indonesian consumers residing in specific regions, which may limit the generalisability of the findings. Future studies could employ more extensive and more diverse samples to enhance the external validity of the results and provide insights that are applicable across different demographic groups and geographical locations. Lastly, while the study focused on EM and CM preferences, other types of electric vehicles, such as electric buses and scooters, were not considered. Exploring the factors influencing consumer readiness across a more comprehensive range of EV types could provide valuable insights into the broader EV market landscape and inform more targeted interventions to promote EV adoption.

Considering these limitations, future research in this field could benefit from adopting a more comprehensive and multi-dimensional approach, incorporating diverse methodologies, expanding the scope of investigation, and ensuring the representativeness of the study samples. By addressing these limitations, future studies can contribute to a deeper understanding of the factors driving consumer adoption of electric vehicles and inform more effective strategies for promoting sustainable transportation.

Declaration of competing interest

The authors declare that they have no known financial or non-financial competing interests in any material discussed in this paper.

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Author contribution

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Ethical approval statement

Ethical approval is not applicable for this research.

Informed consent

Informed consent for the publication of personal data in this article was obtained from the participant(s).

Declaration of use of AI in the writing process

The authors used Grammarly during preparation of this work to improve paragraphs. The authors reviewed and edited the work as necessary and take full responsibility for the final version.

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