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Differential Effects of Single- and Multi-Business Model Car Companies on Consumer Purchase Intentions for Electric Vehicles

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Abstract

In the global automotive industry, electric vehicles (EVs) are receiving a lot of attention due to the rapid advancement of battery technology and the growing demand for sustainable development. This research investigates the differential effects of single and multi-business model car companies on consumers' Purchase Intentions for Electric Vehicles (PIEVs). Single-business model companies specialize exclusively in EV production, while multi-business model firms operate across both traditional and EV segments. A quantitative research design is employed, integrating marketing theory and consumer behavior analysis to explore the company type, marketing strategy, and consumer perception interact to shape PIEVs. Data are collected in China through a structured questionnaire survey grounded in the 4C marketing framework, operationalized through key consumer perception constructs including perceived innovation, consumer trust, brand familiarity, and perceived risk. Data analysis is conducted using SPSS and PLS-SEM software, incorporating reliability testing, CFA, and SEM to analyze model fit and validate hypotheses. Results reveal that SBMT firms significantly influence PIEV ($p < 0.001$). For MBMT firms, BF is ($\beta = 0.25$, $p < 0.001$) positively affected intention, while PR is negatively impacted intention ($\beta = -0.27$, $p = 0.001$). The comparative analysis demonstrates that SBMT firms generate stronger PIEV through focused strategies and clear environmental positioning. By providing a comparative viewpoint on how various business models affect consumer purchasing decisions in the EV market, this study advances both scholarly knowledge and methods of management.

Keywords

Electric Vehicles (EVs), Business Model Strategy, Consumer Purchase

Intention, Structural Equation Modeling (SEM), Marketing Strategy, Sustainable Mobility, Car Companies

1. Introduction

The world automobile industry is experiencing a fast and radical transition to sustainable mobility through technological advancement, government regulations, and growing consumer awareness of climate change (Shi et al., 2020). EVs have become a key to achieving ecological sustainability through the development of sustained environmental resilience and a decrease in greenhouse gases as a result of ongoing advancements in battery, charging, and green energy efficiencies (Ramesh & Balachander, 2024). The evolution of the marketing strategy and the consumer behavior analytics has helped car manufacturers in this regard as well, helping to understand how the buyers feel about EV products, brands, and corporate visions, thus influencing the preferences in purchasing in new and very competitive markets (Yeğin & Ikram, 2022). The EV world draws attention to the great importance of business model strategy as a determinant of consumer acceptance and purchase (Lashari et al., 2021). The companies identified as single-business model companies focus on the production of EVs, and they are known to have a high level of environmental identity, innovation focus, and technological leadership (Miranda & Delgado, 2020). Multi-business model car companies, in their turn, have both fuel-powered and electric lines of products, with the advantage of both brand recognition and an established network of dealerships, and product diversification (Topolšek et al., 2020). Even though both business models are effective in the market expansion of EVs, their differences in the PIEV of consumers are under-researched (Trivedi & Kishore, 2020). This gap formed a pressing need to explain the effect of the two categories of business models on consumer thinking, emotions, and decision making. When deciding on a company committed to EVs as the symbol of high innovation and a multi-segment company that provides a feeling of brand security and leaves doubts regarding the reliability in the long-term commitment to sustainability, consumers are often unsure (Riptiono, 2022). Such psychological processes prove that strategic positioning and marketing perception cannot be the same in all types of companies and is to be empirically investigated further. This set of dynamics is vital in enhancing the adoption of EVs in the market, policymaking, helping manufacturers to create targeted marketing strategies, and facilitating the introduction of low-carbon mobility globally (Sobiech-Grabka et al., 2022).

Research Objective: This research aims at comparing the various effects of single and multi-business model cars companies on consumer PIEVs. The research has quantitative research design and relies on the statistical modeling with theoretical basis of the 4C marketing framework. A structured questionnaire is applied on potential EV buyers and the data obtained are examined by the way of statisti-

cal testing applied in assessing the causality of the relationships and the pattern of marketing influence.

The research was organized as follows: The Introduction is presented in Section 1, related works overviewed in Section 2, methodology details in Section 3, experimental results overviewed in Section 4, Section 5 discusses the results and prior research, while Section 6 concludes the future study.

2. Previous Research

EVs were crucial in enhancing energy conservation and reducing emissions which are beneficial to a sustainable business. Xie et al. (2022) analyzed the factors that have an impact on the intentions of people to purchase EVs as China shifts towards a market paradigm, not relying on financial incentives. The results indicated that PR plays the role of mediating variables between the attributes of innovation and PIEVs. This study determined a gap by investigating the relationship between psychological and policy features in shaping consumer intentions. A qualitative comparison evaluation of Chinese data based on fuzzy-sets indicated that a presence of any one psychological feature correlated with the presence of high EV buying intentions, and the absence of all three psychological variables even with purchase subsidies is correlated with poor PIEVs (Ye et al., 2021). Huang and Qian, (2021) recognize the psychological factors that affect the acceptance of EVs among consumers into the innovative business models such as consumer sharing and financing. It concluded that the necessity of distinctiveness improves the psychological impressions of EVs in consumers by increasing their intent to adopt them. Dutta and Hwang, (2021) applied the modified TPB paradigm in studying the influencing factors of the consumer intention of using sustainability EVs. The initial model (TPP) had the highest predictive accuracy. The findings indicated that customers from Taiwan region are highly preoccupied with environmental issues and this is an indicator of their readiness to spend on sustainable purchasing.

Reinhardt et al. (2020) analyzed the growth of SBMs in the growing B2U segment of the EV industry. It highlighted the absence of comprehensive frameworks that connect SBMs to EV B2U and highlights the importance of ecological and social stakeholder good along with financial performance. Acciarini et al. (2022) focused on the automotive sector and analyzed the impact of the digitizing trend on the development of sustainable organizations strategies. Odriozola-Fernández and Berbegal-Mirabent (2020) used empirical evidence of multiple studies to investigate the impact of open innovation approaches on SME business strategies within the automotive sector. It pinpoints a number of tactics that altered business paradigms and boost output. BEVs and hydrogen-based FCEVs were important innovations under discussion. There are three possible futures: BEVs' and FCEVs' coexisting, FCEVs' being introduced conditionally, or BEVs' exclusively. Four potential outcomes were suggested, such as greatest adaptability, service-oriented BEV manufacturing, technological expansion, and BEVs solely (Ziegler & Ab-

delkafi, 2023). Zhang et al. (2022) examined the relationships between customer perceptions, particularly perceived quality and trust, as well as adoption intentions and data on EVs, such as performance-associated and environmentally conscious materials. Liusito et al. (2024) examined how CT and feedback on products. Affect Manado residents' intentions to buy EVs. The findings showed that the desire to purchase electric automobiles was significantly positively impacted by consumer trust and product reviews. The automotive market was exploring EVs' as a green option with the exhaustion of fossil fuels and increasing prices. Tupe et al. (2020) reviewed the possible ways of utilizing EVs and have measured the consumer attitude towards cars.

3. Research Methodology

The quantitative design is incorporated in the methodology to study the moderating role of consumer perceptions on PIEV and the moderating role of the type of business model. The data are collected through the validated questionnaire and 280 potential EV buyers, regarding constructs. The analytical procedures comprise the use of SPSS, which was to be utilized in analyzing the reliability, PLS-SEM, which was to be utilized in carrying out CFA and SEM, and Multi-group comparisons, which was to be used in determining the differences between SBMT and MBMT firms. The process of the research technique is depicted in Figure 1.

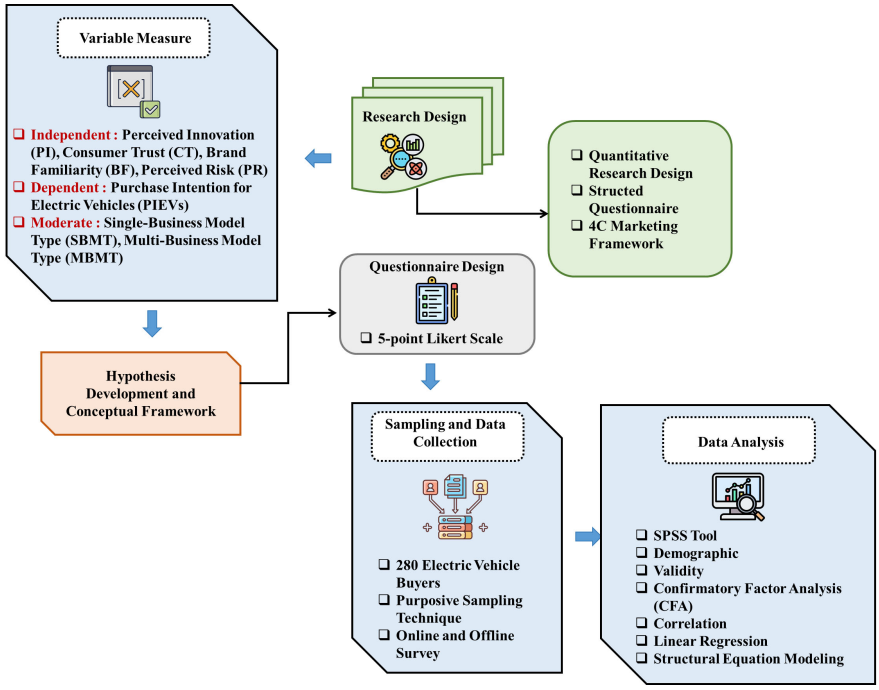

Figure 1. Flow of research methods.

3.1. Research Design

The research is theoretically based on the 4C marketing model (Cost, Convenience, Communication, and Consumer Demand) that focuses on value creation

oriented towards the consumer. Perceptual constructs that are popular within the literature of electric vehicle adoption operationalise the framework in this research. In particular, the perceived innovation is the consumer demand, and it can be discussed as the level or degree of satisfaction of EVs with changing technological and sustainability requirements. Communication is embodied by consumer trust; this implies confidence stemming out of brand communication and credibility. The familiarity with the brand (BF) is a manifestation of convenience lowering the degree of information-processing and increasing the perceived ease of access. The operationalization of cost considerations is perceived risk (PR) as a set of financial, performance, and maintenance risks that are linked with EV purchases.

Although the single-business model type (SBMT) and the multi-business model type (MBMT) are often defined as objective types of firm-level, in this study, it is conceptualized as latent types of consumer perceptions instead of firm objective characteristics. In particular, SBMT reflects the degree to which customers believe that a given firm is strategic in its orientation to electric vehicles, which is perceived in exclusivity in the manufacture of electric vehicles and a high level of innovation orientation, and a long-term investment in sustainable mobility. MBMT indicates how consumers perceive a diversified business model orientation, where a company is considered to be running both traditional internal combustion engine and electric vehicle companies that are backed by brand heritage and range of portfolio. Since these constructs are the scale of consumer perception not binary firm typologies, they are not categorized by grouping variables, but instead by continuous latent variables.

3.2. Variable Measurement

Multi-item reflective scales (SBMT1 - SBMT3 and MBMT1 - MBMT3) based on the previously existing business model and EV marketing literature are used to measure SBMT and MBMT. The SBMT items were used to measure the perceptions of the respondents with regard to the strategic focus of a firm such as specialization in EV technology, consistency in sustainability message, and coherence of innovation orientation. MBMT items capture the perceived diversity of business model, brand heritage in a variety of vehicle segments, and the presence of both traditional and electric vehicle models. Everything is measured using five-point Likert scale, which reflects the intensity of the perceptions of the consumers, but not the classification of the firm objectively. Four independent variables, including PI, CT, BF, and PR, are analyzed in terms of their impact on the PIEV of consumers. PIEV is the dependent variable, that is, the probability of the consumer PIEV. The effect of the business model type is moderating, which is summarized by the SBMT and MBMT, and shows how the firm's strategy can influence such relationships. Control variables such as age, income, education, and prior EV exposure are included to take into consideration the differences among individuals. Validated variations of the scales used in the previous literature, and a structured

Likert-scale questionnaire are used in measuring all constructs.

✓ **The use of Perceptual Constructs in 4C Framework.**

The theoretical basis of this study is the 4C marketing paradigm of Cost, Convenience, Communication, and Consumer Demand that focuses on value creation process aimed at the consumer. In this context, the model is operationalized in terms of four perceptual constructs applied to the electric vehicle (EV) adoption.

- Perceived Innovation (PI) is Consumer Demand characterized by the consumer ratings of the suitability of EVs to changing technological, environmental, and sustainability demands. The greater the perceived innovation, the greater the consumer demand due to the technological development and future preparedness.
- The Consumer Trust (CT) operationalizes Communication since it is a measure of consumer confidence in EV brands which are developed by consistent, credible, and transparent brand communication. Trust helps in minimizing uncertainty and enhancing the credibility of marketing communication messages and corporate statements.
- Brand Familiarity (BF) goes hand in hand with Convenience by diminishing the amount of cognitive effort needed to make a decision. The established brands can be more readily identified and assessed, reducing the costs of information-processing and raising the perceived access and ease of adoption.
- Perceived Risk (PR) incorporates Cost consideration by performing the perceptions of financial, performance, and maintenance risks that consumers have in buying EVs. The psychological and economic costs of adoption are heightened in case of higher perceived risk hence, driving down on purchase intentions.

All these perceptual constructs make the abstract dimensions of the 4C marketing model measurable variables that describe consumer judgments and adoption behavior in the electric vehicle situation.

3.3. Hypotheses Development and Conceptual Framework

PI, CT, BF, and PR are consumer perceptions that have a central role in determining PIEV. The hypotheses are analyzed in the presence of the direct impacts of these factors and the moderating impact of business model type. Particularly, SBMT and MBMT are likely to either build the strength or decrease it in these relationships of various dimensions of consumer perception. Figure 2 depicts the Conceptual Framework.

H1: PI expects to be positively and significantly enhanced consumer PIEV, as higher innovation recognition increases interest in adopting new technology-based mobility solutions.

H2: CT is hypothesized to have a positive and significant impact on PIEV, since greater confidence in the brand and product reliability encourages consumers to consider EVs as a credible and safe purchase option.

H3: BF is anticipated to positively and significantly influence PIEV, with stronger

awareness and recognition of the company enhancing consumers' likelihood of selecting its electric vehicle offerings.

H4: PR is proposed to positively and significantly affect PIEV, as higher concerns related to performance, maintenance, or financial uncertainty reduce the likelihood of consumers proceeding with EV purchase decisions.

SBMT and MBMT are modeled as perceptual moderators rather than mutually exclusive firm types, reflecting alternative strategic orientations that differentially amplify or attenuate the influence of innovation, trust, brand familiarity, and perceived risk on electric vehicle purchase intention, since consumers' perceptions of a firm's business model orientation condition how these factors are interpreted.

H5: SBMT moderates the relationship between PI and PIEV, expects to be stronger for single-business model firms.

H6: SBMT moderates the relationship between CT and PIEV, expects to be stronger for single-business model firms.

H7: MBMT moderates the relationship between BF and PIEV, expects to be stronger for multi-business model firms.

H8: MBMT moderates the relationship between PR and PIEV, expects to be stronger for multi-business model firms.

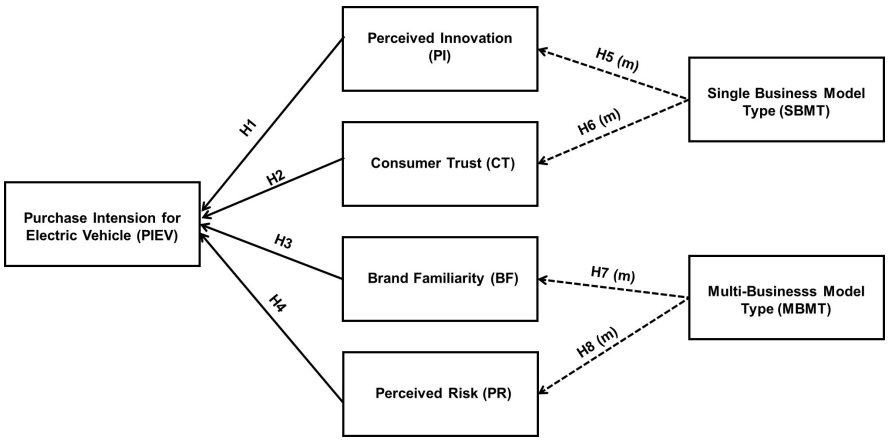

Figure 2. Conceptual framework.

3.4. Questionnaire Design

A 5-point Likert scale is used in the questionnaire's development to measure respondents' degree of agreement with each item. Adaptation of items is done based on already tested scales in the previous literature, to make them reliable and relevant to the purchase behavior of EVs. Questions were formulated to address all the major constructs, such as PI, CT, BF, PR, and PIEV. The layout ensured clarity, consistency, and understanding for respondents, facilitating accurate data collection.

3.5. Sampling and Data Collection

A target sample of 280 potential EV buyers is used to obtain data in China that would comprehensively represent the consumer population. The purposive sam-

pling technique is utilized, and the selection is centered on people who had either an interest or exposure to EVs in the past. The questionnaire is administered online and offline since it targeted a wide range of respondents.

3.6. Data Analysis Tools

The analysis is done in SPSS and PLS-SEM software to provide a high level of statistical analysis. This tool is used to produce descriptive statistics, evaluate demographic variables, and test the reliability of the constructs by the α. CFA is done on PLS-SEM to test the measurement model and SEM to test the hypothesized relationships. The model fit indices are studied to make sure that the SEM is sufficient, and a multi-group SEM is carried out to compare the effects between SBMT and MBMT firms. This is accompanied by other analyses, such as measurement invariance and other possible mediation or moderation effects, to give a complete picture of how consumer perceptions, business model type, and purchase intention are related.

4. Result

The analysis investigates the consumer intention to purchase an EV based on the structural analysis. Demographic information demonstrates a heterogeneous sample, whereas the dependability and CFA test the validity of the constructs. The results of correlation and regression analyses indicate the existence of strong direct and moderated effects of PI, CT, BF, and PR on PIEV, and the findings of SEM analysis, with high model fit indices, demonstrate the structure of relationships and the moderating effect of SBMT and MBMT.

This demographic profile (Table 1 and Figure 3) gives a detailed description of the 280 respondents' characteristics in terms of gender, age, income, occupation, education, location, and previous exposure to EVs. The median age of respondents was 35.7 years, with most people having a median age ranging between 26 and 35 years (35.7). The majority of the respondents are male (57.1%), and most of the respondents have undergone an undergraduate education (42.9%). The majority of the participants earned ¥2,551 - ¥5,100 (42.9) monthly and are working (50%), and more are living in cities (64.3%). As far as previous experience with EVs is concerned, 42.9% of the respondents has some experience with EVs, and 57.1% did not. This population sample shows that it is a diverse sample that is utilized to analyze the buying intentions of various consumer groups within the EV market. The data guarantee that the study has experienced views of the potential first-time EV consumers and those who have been exposed to EVs in the past, making the results more generalize.

Table 1. Respondents demographic profile (n = 280).

Demographic Variable	Category	Frequency (n)	Percentage (%)
Age (years)	18 - 25	60	21.4

Continued

	26 - 35	100	35.7
	36 - 45	70	25.0
	46+	50	17.9
Gender Education	Male	160	57.1
	Female	120	42.9
	High School	40	14.3
	Undergraduate	120	42.9
	Postgraduate	90	32.1
	Other	30	10.7
Income (monthly)	<¥2,550	50	17.9
	¥2,551 - ¥5,100	120	42.9
	¥5,101 - ¥7,650	70	25.0
	>¥7,650	40	14.3
Occupation	Student	80	28.6
	Employed	140	50.0
	Self-employed/Business	40	14.3
	Unemployed/Other	20	7.1
Location	Urban	180	64.3
	Rural	100	35.7
Prior EV Exposure	Yes	120	42.9
	No	160	57.1

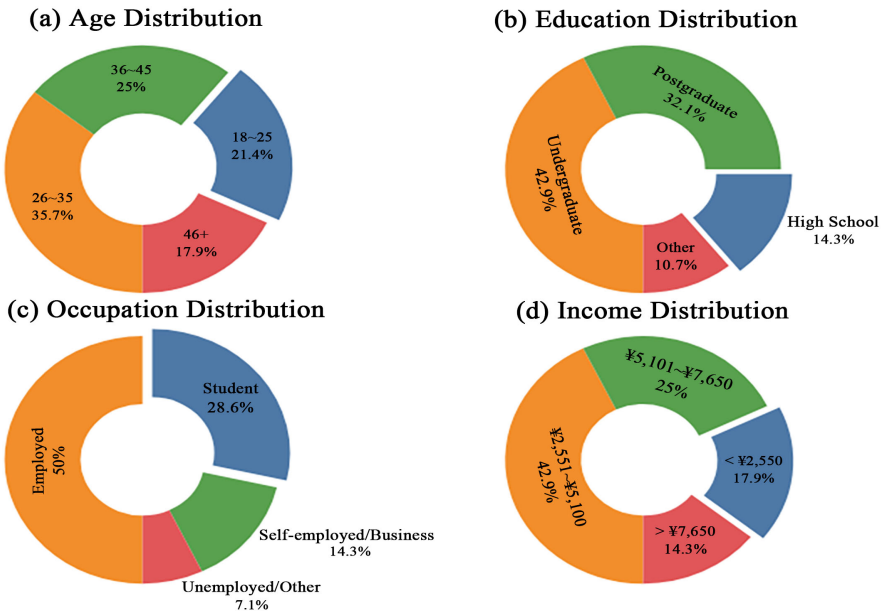

Figure 3. Pie charts showing proportions of respondents (a) Age, (b) Education, (c) Occupation, and (d) Incomes.

The reliability of the research's constructs is assessed using CR and α (Table 2) to make sure that the assessment items consistently reflected the relevant theoretical structures. All the values of α 0.80 - 0.87 with CR 0.84 - 0.90 are above the required value of 0.70, which is the lowest acceptable value, and this corresponds to a strong internal consistency. PI and PIEV are the constructs that displayed the highest levels of reliability, indicating that they provided consistent measurement of the main predictors and outcomes. The moderator variables, SBMT and MBMT, also showed reasonable reliability, which guarantees that there is confidence in the test of the effects of interaction. These findings affirm that the questionnaire questions are good and can be used in structural equation modeling. In total, the results form a strong measuring base to be further used in the analysis of CFA, SEM, and hypothesis testing.

Table 2. Analysis of each construct's validity and reliability.

Construct	Items	α	CR
PI	PI1, PI2, PI3, PI4	0.84	0.88
CT	CT1, CT2, CT3	0.86	0.89
BF	BF1, BF2, BF3, BF4, BF5	0.83	0.87
PR	PR1, PR2, PR3, PR4	0.80	0.84
PIEV	PIEV1, PIEV2, PIEV3, PIEV4	0.87	0.90
SBMT	SBMT1, SBMT2, SBMT3	0.82	0.86
MBMT	MBMT1, MBMT2, MBMT3	0.81	0.85

Note: Substantial internal coherence is indicated by all α values exceeding the minimum permissible criterion of 0.70.

CFA (Table 3) is conducted to validate the measurement model and confirm that each construct accurately measures its intended concept. Factor loadings are standardized (ranging between 0.78 and 0.88), which is higher than the required factor loading (0.70), which means that factors are highly reliable. The values of the AVE between 0.56 and 0.66 indicates convergent validity of all the constructs, PI, CT, BF, PR, PIEV, and the moderating variables, SBMT and MBMT. Extraordinary high factor loadings and tolerable AVE values indicate that every item adds significance to the corresponding latent construct. These findings confirm the measurement model and corroborate the strength of the SEM. The CFA testifies the constructs are different, consistent, and can be used in further SEM and hypothesis testing analyses.

Table 3. CFA results of constructs.

Construct	Item	Standardized Factor Loading	AVE	Convergent Validity
PI	PI1	0.84		
	PI2	0.82	0.62	✓

Continued

	PI3	0.83		
	PI4	0.81		
CT	CT1	0.86		
	CT2	0.85	0.64	✓
	CT3	0.84		
BF	BF1	0.83		
	BF2	0.82	0.59	✓
	BF3	0.80		
	BF4	0.81		
	BF5	0.79		
PR	PR1	0.81		
	PR2	0.78	0.56	✓
	PR3	0.80		
	PR4	0.79		
PIEV	PIEV1	0.88		
	PIEV2	0.87	0.66	✓
	PIEV3	0.85		
	PIEV4	0.84		
SBMT	SBMT1	0.81		
	SBMT2	0.82	0.61	✓
	SBMT3	0.80		
MBMT	MBMT1	0.79		
	MBMT2	0.81	0.60	✓
	MBMT3	0.80		

Table 4 provides information on the direction and the strength of relationships among the constructs of the study. PI, CT, and BF have a positive correlation with PIEV between 0.58 and 0.64, whereas PR correlates negatively (−0.47), thus, it includes an adverse influence on purpose. The moderator variables, SBMT and MBMT, have moderate levels of correlation with both the predictors and PIEV, which indicates that they can mediate the strength of these correlations. The significant correlations at $p < 0.01$ indicate significant associations between constructs. Such findings give preliminary evidence of the hypothesized direct and moderating effects. All in all, the correlation analysis reveals the applicability of the constructs to explain what the consumers want to buy in the EV context.

Table 4. Correlation matrix of study constructs.

Construct	PI	CT	BF	PR	PIEV	SBMT	MBMT
PI	1	0.52	0.46	−0.38	0.61	0.41	−0.39
CT	0.52	1	0.49	−0.41	0.64	0.39	−0.42
BF	0.46	0.49	1	−0.35	0.58	0.32	−0.37
PR	−0.38	−0.41	−0.35	1	−0.47	−0.31	0.33
PIEV	0.61	0.64	0.58	−0.47	1	0.40	−0.38
SBMT	0.41	0.39	0.32	−0.31	0.40	1	−0.45
MBMT	−0.39	−0.42	−0.37	0.33	−0.38	−0.45	1

Table 5 performs the effects of the predictors and the moderator effects on PIEV. PI, CT, and BF show all positive and significant effects on PIEV (β = 0.36, 0.32, 0.25, respectively; $p < 0.001$), whereas PR has a significant negative impact (β = −0.27; $p = 0.001$). The model overall accounts for 61% of the variance in PIEV, which implies a good predictive power. These findings prove the direct hypothesis and the interaction hypothesis because the business model type moderates the relationship of key predictors to consumer PIEV. The results are an empirical testimony to the fact that segmented strategies can be effectively used to affect the uptake of EVs by various groups of consumers. The interaction terms included in Table 5 represent moderation effects of perceived business model orientations, not categorical firm membership. SBMT-based interactions capture the effect of perceived specialization, while MBMT-based interactions capture the effect of perceived diversification. Table 5 presents the regression-based robustness analysis of the hypothesized relationships, while the structural relationships and hypothesis testing are primarily evaluated using PLS-SEM (Figure 4 and Table 6).

Table 5. Regression-based robustness analysis of predictors and interaction effects.

Variables	B	SE	β	t-value	*p*-value
PI	0.42	0.07	0.36	6.00	<0.001
CT	0.38	0.08	0.32	4.75	<0.001
BF	0.29	0.06	0.25	4.83	<0.001
PR	−0.33	0.09	−0.27	−3.67	0.001
SBMT × PI (Interaction)	0.12	0.05	0.10	2.40	0.02
SBMT × CT (Interaction)	0.10	0.04	0.08	2.25	0.03
MBMT × BF (Interaction)	0.14	0.06	0.11	2.33	0.02
MBMT × PR (Interaction)	−0.11	0.05	−0.09	−2.20	0.03

Note: Adjusted $R^2 = 0.60$, $R^2 = 0.61$, $F = 92.45$ and $p < 0.001$.

The moderation effects reflect variations in consumer purchase intention based on perceived business model orientation rather than objective firm categorization.

The SEM (Figure 4) is a graphic depiction of the postulated relations among the independent variables (PI, CT, BF, and PR), the dependent variable (PIEV), and the moderator variables (SBMT and MBMT). The arrows show the β, which denote the strengths and direction of each relationship, with significant relationships reflecting the moderating impacts of business model type. This figure gives a clear representation of the SEM as it shows how both direct and moderated paths are involved in Customers' PIEVs.

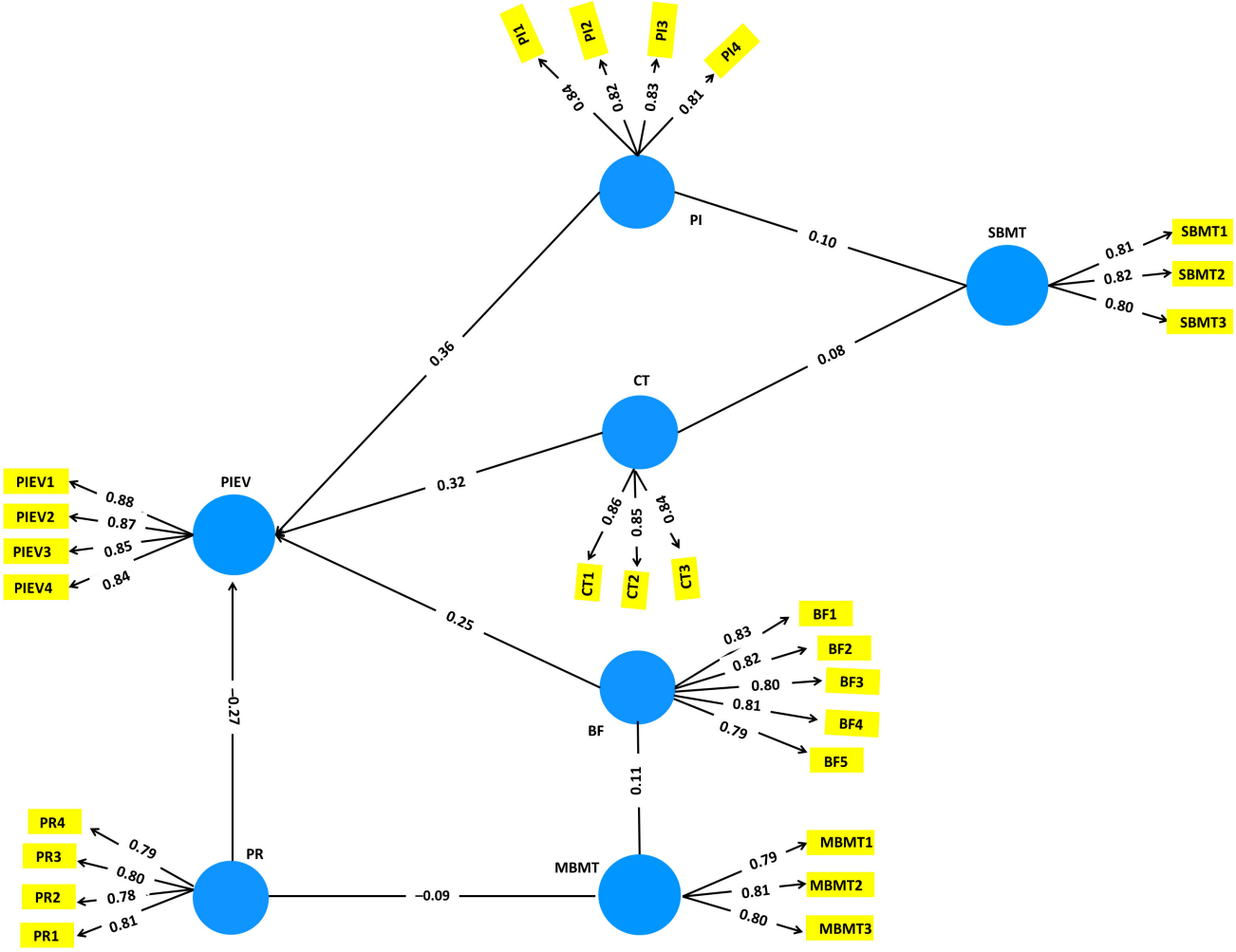

Figure 4. SEM diagram.

The SEM is tested to assess the hypothesis relationships (Table 6) between predictors, moderators, and PIEV. β indicate that PI, CT, and BF positively influence PIEV, while PR has a significant negative effect, all supporting H1 - H4 ($p \leq 0.001$). The outcomes of moderation indicate that SBMT leads to the strengthening of PI and CT relations with PIEV (H5 - H6), and MBMT leads to the augmentation of the BF influence and enhancement of the adverse influence of PR (H7 - H8), which proves the moderating roles of business model types. The results demonstrate the distinction and provide factual support for both direct and indi-

rect interactions of business model approaches of both SMBT and MBMT models in influencing consumer PIEVs. Generally, the results validate the strength of the SEM and the applicability of the business model type in affecting the EV adoption behavior.

Table 6. SEM results with hypothesis testing.

Hypothesis	Path	Standardized Coefficient (β)	SE	t-value	*p*-value	Result
H1	PI → PIEV	0.36	0.06	6.00	<0.001	Supported
H2	CT → PIEV	0.32	0.07	4.75	<0.001	Supported
H3	BF → PIEV	0.25	0.05	4.83	<0.001	Supported
H4	PR → PIEV	−0.27	0.08	−3.67	0.001	Supported
H5	SBMT × PI → PIEV	0.10	0.04	2.40	0.02	Supported
H6	SBMT × CT → PIEV	0.08	0.03	2.25	0.03	Supported
H7	MBMT × BF → PIEV	0.11	0.05	2.33	0.02	Supported
H8	MBMT × PR → PIEV	−0.09	0.04	−2.20	0.03	Supported

Note: Model Fit Indices: CFI = 0.96, RMSEA = 0.045, SRMR = 0.048, $\chi^2/df = 1.85$and TLI = 0.95.

5. Discussion

Several studies are conducted to understand aspects that can influence the PIEVs. Xie et al. (2022) explored how the innovative nature affects the PIEVs in China and noted that PR acts as an intermediary between the innovative features and PIEVs. Although, such lifestyle considerations as ecological awareness has a positive impact on adoption, price consciousness has a weak impact, which created loopholes in covering the socio-demographic disparities. Huang and Qian (2021) emphasize the psychological aspects of new business models, such as shared and financing models, and reveals that the necessity of being distinct enhances the PIs and lowers the adoption due to risk aversion. Their analysis, however, fails to have a complete integration of classical constructs such as BF or PI, which is a limitation to overall generalization. Liusito et al. (2024) investigates the effect of CT and product reviews in Mando and they found that these two elements have a substantial influence on PIEV. However, their research is limited in terms of geography and fail to include moderating factors like the type of business model of firms. The present research addresses these weaknesses by incorporating PI, CT, BF, and PR at the same time, investigating the moderating roles of SBMT and MBMT firms. This research should be viewed as having a more generalizable and comprehensive insight into the factors affecting the overall PIEVs and the strategic role of the type of business models in its effect on consumer behavior by gathering data on multiple respondents belonging to various demographic groups.

Multi-group SEM analysis to overcome the possible fears of mutual exclusivity was performed by dividing the sample into those whose business model orienta-

tion was predominantly perceived as the most important. The findings indicate a consistent trend with the interaction analysis, where perceived specialization reinforces the action of innovation and trust and perceived diversification reinforces the action of brand familiarity and risk. The convergence provides support to the strength of the moderation logic.

6. Conclusion

Car companies can have an impact on consumer PIEVs, influencing the perception of PI, CT, BF, and PR based on business models and marketing strategies. Their strategy dictates the way consumers consider the benefits, affordability, and reliability of EVs, and this influence the chances of them making a purchase. The moderating effects of the type of business model are CT, BF, and PR. According to the findings, PI ($\beta = 0.36$, $p < 0.001$), CT ($\beta = 0.32$, $p < 0.001$), and BF ($\beta = 0.25$, $p < 0.001$) have a positive effect PIEVs. Moderation analysis shows that SBMT has enhanced the effects of PI and CT, but MBMT has increased the effect of BF and the negative effect of PR. The research's dependence on a cross-sectional survey limits its capacity to deduce causal correlations. Longitudinal designs are used in future studies to address the influence of other factors, with more mediators like environmental concern or social influence, to define the factors that determine PIEV more and to inform more on sustainable business strategies.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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List of Abbreviations

Abbreviations and Variables	Definition
EVs	Electric Vehicles
CFA	Confirmatory Factor Analysis
SEM	Structural Equation Modeling
PI	Perceived Innovation
CT	Consumer Trust
BF	Brand Familiarity
PR	and Perceived Risk
SBMT	Single-Business Model Type
MBMT	Multi-Business Model Type
SPSS	Statistical Package for the Social Sciences
PLS-SEM	Partial Least Squares-Structural Equation Modeling
α	Cronbach's
CR	Composite Reliability
B	Unstandardized Coefficient
β	Standardized Coefficient or Standardized Path Coefficients
χ^2/df	Chi-Square divided by Degrees of Freedom
CFI	Comparative Fit Index
TLI	Tucker–Lewis Index
RMSEA	Root Mean Square Error of Approximation
SRMR	Standardized Root Mean Square Residual
TPB	theory of planned behavior
SBMs	sustainable business models
B2U	battery second-use
SMEs	small and medium-sized businesses
BEVs	Battery electric vehicles
FCEVs	fuel cell electric vehicles