

The Preference of Indonesian Car Consumer: The Comparison Between Chinese to the Other Manufacturers

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Abstract - The continuous economics improvement of various developing countries has led to a significant increase in the world's overall demand for cars. The massive development of China's economy allows car manufacturers to expand their business specifically in Indonesia. Nevertheless, the quality fade strategy that was commonly used by past Chinese car manufacturers has caused Indonesian consumers to still have trauma with the Chinese products, shown by poor annual sales performance. Hence, the researchers want to acknowledge any attribute that significantly affect Indonesian car consumer preference by using stated choice experiment. The experiment utilize the NGENE Choice Metrics to develop the scenario based on 9 alternatives and 7 attributes. In terms of data collection, there are a total of 590 respondents were involved in filling out the questionnaires. Hereafter, we use multinomial logistic regression in conjunction with Pandas Biogeme as the tools of analysis. Moreover, Indonesian car consumers consider the purchase price, engine capacity, resale value, safety rating, availability of services, and exterior-interior design as the important attributes. Thus, Chinese car manufacturers should focus on improving those factors.

Keywords – Annual Sales Performance, Car Attributes, Car Ownership, Chinese Car Manufacturers, Choice Modelling.

I. INTRODUCTION

A large amount of medium-economic class has emerged due to significant increase in Gross Domestic Product (GDP) for a substantial number of developing countries [1]. Thus, many industries increase in scale including the automotive since the increment of car ownership is directly proportional to the GDP growth [2]. For the example, number of Indonesian car user has increased rapidly in between the year of 2000 to 2006, with the specific amount of 3,038,913 to 6,035,291 cars [3]. Afterwards, the Indonesia's GDP continues to increase and stated up-trend growth, starting from USD 831 to USD 1,589 for the similar period of time [4].

In accordance with these trend, Chinese car manufacturers decided to compete in the Indonesian market, started by PT Chery Mobil Indonesia which cooperate with Indomobil Group as the official agent of the brand holder in 2006. Hereafter, the company had succeeded to sell as much as 3,216 units during the 6 years of business period [5]. In addition, another Chinese car manufacturers, namely as PT Geely Mobil Indonesia came up in 2011, had managed to sell for 3,080 units during the 4 years of business period [6]. Both Chinese car companies

has a low amount of sales and short business period because of bad product quality control, poor car quality, scant marketing campaign, and bad internal management for the many cases of fraud and corruption [7]. Hence, it brings out Indonesian customer distrust towards Chinese Car brands, marked by the creation of "Made in China" stigma for Chinese automotive industry.

In 2015, Chinese car manufacturer namely as PT SGMW Indonesia (Wuling) compete in the Indonesian market by starting with allocate several investments that worth more than USD 700 million (Rp 9.3 trillion) to support the company's business activities [8]. Moreover, Chinese car automaker known as DFSK, did the similar strategy with the USD 150 million (Rp 2.15 trillion) investment for the development of company's infrastructure [9]. In 2018, Wuling aimed for 30,000 sales units through announcement of its new car model [10]. Unfortunately, the company just managed to sell for 17,020 units (56,73%) at the end of period [11]. In the following year, the company was not dare to announce the sales target yet Wuling has managed to sell as much as 22,343 units during the year [12]. Hence, the company even failed to achieve its previous annual sales target. Moreover, DFSK was even worse in terms of accumulated annual sales with the specific amount for 512 units in 2018 [13]. In 2019, DFSK announced its sales target for 12,000 units yet the company only could sell its products as much as 2,638 units (21.98%) [14].

Both companies has failed to achieve its own target. In addition, those sales number just a fraction compared to the Japanese competitors. Toyota and Honda accumulated sales in 2018 respectively for 356,063 units [15] and 162,170 units [16]. In the following year, the trends remain similar, consist of Toyota for 331,797 units [17] and Honda for 149,439 units [18]. Afterwards, in 2019, Japanese car automakers dominate the Indonesian market with the market share proportion of 96.97% while the Chinese only acquired as much as 2.25% [19]. Thereafter, Korean manufacturers is starting to maximize its business operation through large investment for a new local plant development [20]. Thus, the author incorporates Chinese, Japanese, and Korean manufacturers as the research objects. In addition, the researcher want to confirm whether the Indonesian car consumer prefer other car brand's origin rather than Chinese brand by examining the factors which significantly influence them on buying a car. Hence, the researcher want to develop the significant car physical attributes in order to enhance company brand image and

boost selling number. Thereafter, this paper is construct based on five components, consist of introduction, literature review, methodology, discussion, and conclusion.

II. LITERATURE REVIEW

Car ownership levels largely influenced by the increasing country GDP [21]. Hereafter, number of possibilities to purchase more and larger cars enhance directly proportional to increment of income levels [22]. To acknowledge the behavior of Indonesian car consumer, the researcher utilize the choice modelling. Choice modelling is a model which generates substantial affluent set of preferential data because it implicates the process of enquiring respondents to select between more than two alternatives that involve various attributes each [23]. The model has a constant improvement on data collection and analytical methods while disaggregate data construct the structure of choice modelling so it eases the planners and policy makers to utilize [24].

To determine attributes to be tested as hypotheses, researcher use the previous studies and exploratory research as a basis for decision making. Moreover, each attribute that is considered a hypothesis will be explained in the next section.

a. Purchase Price

Price is identified as the sum of money charged from consumers for exchange its value and benefit of having or using the product or services [25]. As a result, price is a major element in purchase intention, particularly for regularly purchased items [26]. In terms of car purchasing, price is a highly prominent attribute even though it may not be the single most important [27].

H1. Purchase price has negative association on a buyer choice decision for purchasing the car.

b. Performance (Engine Capacity)

Performance is in correlation with the functioning of the car that emphasize peak torque, maximum potential speed, braking capability, and handling [28]. Afterwards customers allocate massive proportion of consideration to both the car speed and sportiness [29]. Hereafter, vehicle performance is very substantial in consumer consideration for buying a specific car, thus horsepower is often included in car advertisements [30].

H2. Performance has positive association on a buyer choice decision for purchasing the car.

c. Fuel Efficiency

Other than as technical accomplishment, highly fuel-efficient car enhances the consumer's adoption [31]. Analysts altogether with media concerned to the large decreasing number of sales in terms of large SUVs in US market due to the huge increasing of gasoline prices [32].

This trend also supporting by U.S EPA (Environmental Protection Agency) in 2013 by including annual and five-year fuel expenses for the new car [33]. The new EPA labels grow on consumer purchase decisions to buy more small cars and less SUVs. Thereafter, consumer appreciate the car that has a better fuel efficiency at a higher price as long as they obtain more benefit in between low operational (fuel) cost and the additional [34].

H3. Fuel efficiency has positive association on a buyer choice decision for purchasing the car.

d. Resale Value Year 5

Fluctuation of car resale value is determined by several internal factors, consists of condition, model, and brand which accompanied by range of mileage [35]. Furthermore, external factors including quality enhancement for newer generation, parts support for those models, and third-party reviews also influence the car value for tomorrow [36]. In addition, higher future fuel savings potray the increment of resale prices [37]. Since many customers sell their vehicle at the range of three to five years, the vehicle resale value is important consideration to the consumer purchasing decision [38].

H4. Resale Value has positive association on a buyer choice decision for purchasing the car.

e. Safety Rating

Car safety systems have a substantial leverage in terms of narrowing the number of possibility death toll so as it raise the concern of motorists related to [39]. In general, safety systems can be categorized into active and passive systems while active contribute to prevent collision from happening and passive contribute to lower the potential injury generating from a crash. To calculate the protection effectiveness of safety systems, each new car received ratings based on its respective performance through government crash simulations program while the top overall rating is five stars [40]. Since car could be classified as high involvement products which involve both high price and commitment, consumer will try to acknowledge as much information as possible on the safety sections of vehicle before they proceed to purchase [41].

H5. Safety Systems has positive association on a buyer choice decision for purchasing the car.

f. Availability of Services

The existence of car dealership still substantial for car buyers for several reasons such as physically experience, seek for expert advice, and personal aspects [42]. Most customers want to feel directly by looking, touching, and testing the car through the driving experience before proceed to buy their one of the largest typical investments. They also searching for deeper information and advice related to the extra car equipment and supplementary

services such as financing and insurance. Moreover, buyers value the sales process as personal aspects since it reflected brand representation, customer retention, and service offerings. In addition, automakers and auto dealers gives the experience for every car consumer who literally want to spurn the tires and become enthusiastic for sit behind the wheel of the brand-new car in the showroom [43].

H6. Availability of services has positive association on a buyer choice decision for purchasing the car.

g. Exterior-interior Design

Attention of exterior styling draw the attention of potential customer and bring them to the phase of seriously consider to buy it through intimation with the car [44]. Those

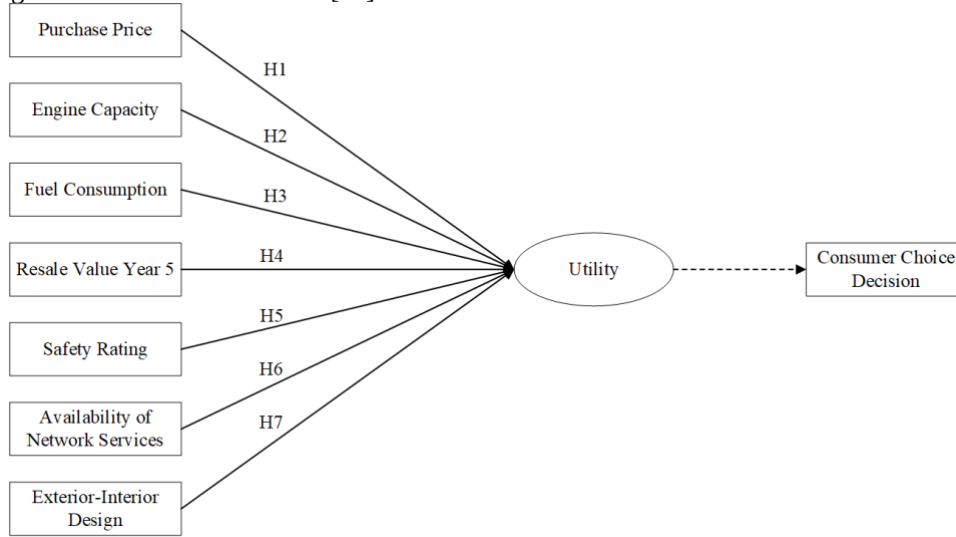


Fig.1. Conceptual framework contains several explanatory variables which represent through hypotheses 1 to 7. Solid arrow represents the objective of the study that contains the correlation amongst the explanatory variable toward consumer choice decision. Moreover, solid arrows also represent the relationship of observed variables that construct the utility. Meanwhile, the dashed arrow shows the choice model constructs by the utility.

III. METHODOLOGY

a. Discrete Choice Model

Multinomial logistic regression is used to forecast and evaluate the probability of categorical membership towards dependent variable and multiple independent variables [48]. Hereafter, the method is an extension of binary logistic regression that enable for more than two categories of the outcome variable. Multinomial logistic regression is also frequently considered as an appealing analysis because the outcomes can lead to specific factors instead of describe the normality or linearity. The author use multinomial logistic regression to measure the implication of independent variables specifically for obeserved variables so this research can make the outcomes which determine any significant factors related to the Indonesian car consumer. Utility is a substantial aspect for the method since the alternative will be selected if the utility value of an alternative is higher compared to the others in the choice set [49]. To ease and make the efficient process, the author will use Pandas Biogeme to test the hypotheses as the circumscription model of the research [50].

emotions that represents through products external appearance can enhance the pleasure of consumer to buy, own, and use them [45]. Therefore, it is not suprising that car exterior design has significant influence on customer preferences [46]. In terms of interior design, this part mostly has been changing rapidly from function and usability, to aesthetics since it mostly exposed to the consumers throughout a long time [47]. Hence, interior appearance represent the aggregate visual feelings and user experience so it influence its comfort driving and first impressions to buy the car.

H7. Exterior-Interior design has positive association on a buyer choice decision for purchasing the car.

Moreover, according to random utility model (RUM) theory, the probability of a person, designated by n chooses an alternative i over a set of alternatives j which maximizes his/her utility U_{in} , is depicted in Eq.1.

$$P_{in} = \Pr (U_{in} > U_{jn}, \forall j \in C_n, j \neq i) \quad (\text{Eq.1})$$

where C_n is a feasible choice set. In this study, the feasible alternatives are nine car alternatives. The utility U_{in} is then decomposed into the deterministic part represented by V_{in} , and the random part represented by ε_{in} , as shown in Eq.2

$$U_{in} = V_{in} + \varepsilon_{in}$$

The utility function for nine alternatives can be seen in Eq.3.

$$U_{in} = \alpha_i + \sum_k \beta_{ki} X_{ki} + \beta_{FAi} F_{Ain} + \varepsilon_{in}$$

where α_i represents alternative specific constant for the person n choosing car i . For this study, the ASC for the Japanese low MPV is set as the reference. β_{ki} is the parameter that defines the direction and importance of attribute k on the utility of an alternative i . Attributes X_{ki} is a vector of alternative specific attributes. F_{Ain} represents an attitude towards sheet mask from the country i for an individual n . β_{FAi} is estimable parameter for latent attitudinal factor for attitude towards country-of-origin cars for alternative i . We assumed that the error term of the utility underlying the dependent variable mode choice is independently and identically distributed with: $\varepsilon \sim \text{Logistic} \left(0, \frac{\pi^2}{3} \right)$.

The model parameters were estimated using maximum likelihood estimation within the software package PythonBiogeme [51]. The maximum likelihood can be obtained by maximising the logarithm of the likelihood function over the unknown parameters:

b. Data Collection

We select to conduct a quantitative approach by using the primary data within utilize a survey and questionnaire respectively as the method and the tool. Survey has the capability to obtain information from large samples of population specifically demographic data that portray the structure of the sample [52]. For the questionnaire design, it contains the multiple scenarios selection based on the car attribute. There are total of 32 scenarios with 9 alternatives each, divided into 4 different questionnaires to ease the answering process by respondents. In addition, the alternatives consists of 4 Japanese and Chinese products types (LMPV, LSUV, MMPV, MSUV) and 1 Korean product types (MSUV). The scenario are created based on the D-efficient or experiment design by utilizing NGENE Choice Metrics software in order to ease the decision maker to decide their alternatives [56]. The objective is to assess the preference of consumer regarding the type of car by evaluating the best combination of its attribute that attached to. The method used to complete data collection phase is well-known as the stated choice design [53].

Hereafter, population is defined as a comprehensive set of characteristics and sample means a subset of the population [54]. The number of populations reach 26.73 million car owners since the Indonesian car ownership ratio is 99 units of 1000 people [55]. Furthermore, the amount of sample for problem solving research is minimum of 200 respondents [56]. Thereafter, this research involves the respondents within the age range of 25-54 y.o which living in the major cities. The basis of the age range selection is those people already have the capability to buy his/her first car or even upgrade into larger and more cars [57]. Those major cities consist of Jakarta, Bandung, and Surabaya since those cities have the most selling number vehicle in Indonesia [58].

IV. RESULTS

According to Table 1, the researcher acknowledge that 7 alternatives being significant compared to the ASC2 (Chinese LMPV) within the robust t-test value more than 1.66 or less than -1.66. Moreover, the alternatives are consisted of ASC1, ASC3, ASC5, ASC6, ASC7, ASC8, and ASC10. In terms of ASC1, the alternatives (Japanese LMPV) has the significant value shown by the score of rob. t-test of 3.06 (>1.66) while the parameter estimate is 27. Therefore, Indonesian car consumer will prefer to choose Japanese LMPV instead of Chinese LMPV. Meanwhile, for ASC3 (Japanese LSUV), the alternative also has the significant rob. t-test value as much as 3.4. In addition, the parameter estimate of ASC3 is 31.2. Thus, Indonesian car consumer will tend to choose Japanese LSUV compared to the Chinese LMPV when each alternative is available.

TABLE I
Results of MNL Calculation

Name	Parameter Estimate	Rob. t-test
Alternative Specific Constant 1 (Japanese LMPV)	27	3.06
Alternative Specific Constant 10 (Opt Out)	22.7	2.7
Alternative Specific Constant 3 (Japanese LSUV)	31.2	3.4
Alternative Specific Constant 5 (Japanese MMPV)	22.5	2.56
Alternative Specific Constant 6 (Chinese MMPV)	42	2.86
Alternative Specific Constant 7 (Japanese MSUV)	30.6	3.1
Alternative Specific Constant 8 (Chinese MSUV)	39.4	3.04
Chinese MMPV Availability of Services	-0.0467	-2.39
Chinese MSUV Availability of Services	-0.0302	-2.09
Chinese LMPV Exterior-interior Design	1.72	2.64
Chinese LMPV Engine Capacity (L)	2.48	2.29
Chinese LMPV Purchase Price (IDR-M)	0.0241	2.04
Chinese MMPV Purchase Price (IDR-M)	-0.0255	-1.7
Chinese LMPV Resale Value (IDR-M)	0.0513	2.36
Chinese LSUV Resale Value (IDR-M)	0.0267	1.85
Chinese LMPV Safety Rating (NCAP)	0.21	2.5
Chinese LSUV Safety Rating (NCAP)	0.184	1.84

Hereafter, ASC5 (Japanese MMPV) and ASC6 (Chinese MMPV) are considered as the significant alternatives with both rob. t-test score are more than 1.66 specifically for 2.56 (ASC5) and 2.86 (ASC6). Meanwhile, both alternatives has the parameter estimate with the specific amount of 22.5 (ASC5) and 42 (ASC6). Thus, Indonesian car consumer will prefer Japanese and Chinese MMPV over the Chinese LMPV. This behavior can be understood since the medium multi-purpose vehicle (MMPV) is the upgrade version of low multi-purpose of

vehicle (LMPV) so most of car physical attributes are greater.

Thereafter, ASC7 (Japanese MSUV) and ASC8 (Chinese MSUV) has been categorized into significant alternatives with the robust t-test score respectively of 3.1 and 3.04. Both alternatives also has the parameter estimate as much as 30.6 (ASC7) and 39.4 (ASC8). Thus, it can be concluded that Indonesian car consumer will prefer Japanese and Chinese MSUV more than Chinese LMPV. Moreover, ASC10 (opt out) has the significant value for both robust t-test and parameter estimate as much as 2.7 and 22.7. Thus, If the Indonesian car consumer is given the only two options in between the Chinese LMPV or none, then they will prefer to choose none over the Chinese LMPV.

Furthermore, there are several attributes that being significant towards a certain chinese alternatives, consist of purchase price, engine capacity, resale value, safety rating, availability of services, and exterior-interior design. In terms of purchase price, ASC2 (Chinese LMPV) and ASC6 (Chinese MMPV) are considered to has significant attribute with the specific amount of both rob t-test for 2.04 (>1.66) and -1.7 (<-1.66). Moreover, both alternatives also has parameter estimate with the specific number of 0.0241 (ASC2) and -0.0255 (ASC6). Thus, Indonesian car consumer will inclined to choose ASC2 at higher price while ASC6 at lower price.

For engine capacity, there is one chinese alternative that has significant attribute, namely as ASC2 (Chinese LMPV). Hence, the rob. t-test score is 2.29 while the parameter estimate is 2.48. Therefore, ASC2 will has greater probability if the car manufacturers can enhance its engine capacity. Hereafter, ASC4 (Chinese LSUV) is categorized to has significant particular attribute, specifically in resale value. The rob t-test and parameter estimate of this alternative's attribute sequentially are 1.85 and 0.0267. Afterwards, the alternative will has greater chance to be chosen by Indonesian car consumer if the manufacturers can increase its resale value.

In terms of safety rating, there are a total of two Chinese alternatives that being considered to has significant attribute, known as ASC2 (Chinese LMPV) and ASC4 (Chinese LSUV). The rob. t-test for both alternatives are 2.5 (ASC2) and 1.84 (ASC4). Meanwhile, the parameter estimate for ASC2 and ASC4 respectively are 0.21 and 0.184. Thus, Indonesian car consumer will prefer those alternatives to has better safety rating. In case of availability of services, there are a total of 2 Chinese alternatives that has significant attribute, namely as ASC6 and ASC8 (Chinese MSUV). Both rob. t-test value are less than -1.66 with the specific number of -2.39 (ASC6) and -2.09 (ASC8). Moreover, the parameter estimate for ASC6 and ASC8 respectively are -0.0467 and -0.0302. For exterior-interior design, ASC2 (Chinese LMPV) is categorized to has significant attribute with the rob. t-test score and parameter estimate as much as 2.64 and 1.72. Hence, the alternative is preffered to has better exterior-interior design.

V. DISCUSSION

In accordance to multinomial logistic regression calculation, Indonesian car consumer is less preferred Chinese car alternatives as their daily driver. It shown by ASC2 (Chinese LMPV) that being reference category is insignificant towards all Japanese alternatives although the alternative is significant compared to ASC9 (Korean MSUV) which the representative for korean manufacturers. Hence, researcher also identify the significant car attributes of Chinese alternatives that become the main concern for consumer.

Afterwards, the attributes consist of purchase price, engine capacity, resale value, safety rating, availability of services, and exterior-interior design. Purchase price become important since it reflect the amount of capital that the consumer should spend in order to acquire the car. Therefore, consumer in general has more interest with affordable car. In case of ASC2, consumer still can afford the car at higher price since the highest car trim level (most expensive variant) price is yet below the Japanese alternative cheapest variant at similar segment. Nevertheless, for ASC6 (Chinese MMPV), consumer demands the car to be more affordable so the altenative will be more appealing to them.

Meanwhile, engine capacity determines the number of car performance which affect the driving experience. The amount of engine capacity is directly proportional to the car performance number. For ASC2, consumer prefer the alternative to has a bigger engine capacity so it is more capable to pass various road contours. Hereafter, resale value indicates the amount of depreciation cost borne by consumer. Thus, the higher car resale value means the smaller depreciation cost. In terms of ASC4 (Chinese LSUV), the consumer prefer the alternative to has a greater resale value so the car can provide them more capital when it is sold.

Safety rating measure the performance of car safety equipment while the result is shown through the amount of stars that the car received during the crash test. Car with more safety equipment may get much star from authorized institutions yet it means the car become safer in real-world applications. In case of ASC2 and ASC4, consumer inclined to choose both alternatives with a better safety equipment. In addition, Chinese LMPV that currently available on the market, receive only 1 out 5 stars during the ASEAN NCAP test. Hence, the consumer's behavior which demand Chinese car to be safer, can be understood. Hereafter, availability of services represents the number of network dealer services which spread across the region of Indonesia. The more dealer networks a manufacturer has, the easier it is for consumers to carry out maintenance.

Nevertheless, according to the result calculation, consumer prefer Chinese alternatives (ASC6 and ASC8) to has less number regarding its availability of services. Thus, researcher consider that as an unique findings. Afterwards, the author predict the Chinese car consumer tend to choose third party workshop for cheaper fee and more flexible location. In addition, exterior-interior resemble the car

visual quality, outside and inside. Thus, exterior plays a role as a tool to embrace the owner's symbol status while interior is used to comfort consumer throughout driving situation. In terms of ASC2, Indonesian consumer preferred the alternative to has improvement on car exterior-interior design in order to enhance the pleasure in owning the car.

VI. CONCLUSION

Based on the data analysis that have been conducted in the previous chapter, the author could develop the several conclusions to acknowledge the answer regarding the research questions yet comply the research objectives at once. Below are the findings that the author discovers throughout the research:

1. The attributes that affect Indonesian car consumer on buying Chinese LMPV are purchase price, engine capacity, resale value, safety rating, and exterior-interior design. Afterwards, Chinese LMPV is the most affordable choice of all available alternatives so it needs a lot of improvement in various sectors to attract the prospective buyers.
2. In terms of Chinese LSUV, resale value year 5 and safety rating become the significant attributes for Indonesian car consumer on buying those type of car. Number of resale value year 5 show the amount of the depreciation cost in between purchasing and selling the car while safety rating provides a sense of security for the consumer who own it.
3. For Chinese MMPV, the attributes that significant influence the Indonesian car consumer behavior is availability of services. The amount of availability of services eases the car consumer to do the maintenance activities.
4. The attributes that affect Indonesian car consumer on buying Chinese MSUV are availability of services. The amount of availability of services eases the car consumer to do the maintenance activities.

For the managerial implications, Chinese manufacturers could develop the car that suitable with the preference of Indonesian car consumer based on the significant attributes. Hereafter, we provide several recommendations for Chinese alternatives development, consist of exterior-interior design, engine capacity, safety rating (NCAP), and resale value year 5. For exterior-interior design, the manufacturers could start by developing its own design language to make a consistent nifty design, enhance brand identity, and streamline the production costs. In terms of engine capacity, the manufacturers can build smaller engine with turbo to generate a greater amount of performance while retaining the current engine's fuel efficiency.

For safety rating, the companies should provide airbags and anti-lock braking system (ABS) feature as a standard for all car variants. In addition, sophisticated features such as stability control (SC), traction control (TC), and hill start assist (HSA) can be implemented for higher car trim levels. In terms of resale value year 5, the companies can proceed a subsidiary to improve its car's second market price by purchasing and reselling it within some warranties and privileges.

Afterwards, Chinese car companies has less brand positioning compared to other manufacturers because made in China stigma and lack of experience for building and selling car specifically in Indonesia. Therefore, the manufacturers can start to improve the product quality by implementing the research recommendation within the purpose of enhance the customers brand perception. The process was similar with the acceptance of Japanese cars by American society [59] and Chinese smartphones by Indonesian people [60].

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