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# DETERMINANTS OF CONSUMER'S AUTOMOBILE PURCHASE DECISIONS IN CHINA: FOCUS ON AUTOMOBILE SIZE

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China is one of the largest automotive markets in the world. Prominent automotive companies from elsewhere in the world have been entering the local Chinese market in response to the rapid growth of China's automobile purchasing power. Customer need and customer satisfaction is recognized as an important part of corporate strategy. The purpose of this study is to analyze the importance perceptions serving as determinants of Chinese consumers' car purchase decisions. The results of this study will help carmaker better understand Chinese consumers' decision-making behavior, and formulate a new product development strategy and marketing strategy.

**Keywords:** China automobile market, China consumers purchase automobile decision determinants, AHP

## INTRODUCTION

Those Chinese carmakers and foreign carmakers that have entered the Chinese market are investing in R&D for core automotive technology and new automotive energy sources to secure their automotive market share. In particular, most leading foreign carmakers have transferred their core technology to China and are building production lines for alternative-energy automobiles in China. This indicates that China has already entered an automobile popularization period.

The Chinese government has identified the automotive industry as a representative industry that will promote the growth of the Chinese economy in the future. In response, the

government has been actively strengthening various supportive and protective policies relevant to this industry. This promotion of the automotive industry by the government has helped grow the automotive industry; indeed, China became the top automotive market in the world after the 2008 financial crisis. Together with the rapid growth of the Chinese automotive market, major carmakers are actively entering China and devoting themselves to securing the Chinese market through advanced technology and management strategies.

The purpose of this study is to analyze the importance perceptions serving as determinants of Chinese consumers' car purchase decisions. AHP is widely used across industries to address

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multiple-criterion decision-making problems involving subjective judgments (Huang Chu and Chiang, 2008). To this end, this study first summarizes key factors that can be considered major variables during the car purchase decision-making process using a brainstorming-type survey. Next, based on the survey results, the AHP hierarchy is identified by reviewing and analyzing the interrelationship between the factors, and the next survey is analyzed.

The results of this study will help domestic and foreign auto companies better understand Chinese consumers' decision-making behavior, New Product Development and marketing strategy. The survey used herein collects consumers' viewpoints in greater detail than did previous studies, and the AHP method is used to convert participants' inconsistent evaluations into rational ones.

## **ANALYTICAL MODEL DESIGN**

### **Research Background**

When purchasing vehicles, consumers usually consider price, performance, comfort, security, and brand, among other factors. Traditionally, economists and market researchers have been interested in identifying the factors that affect consumers' car-buying behaviors to estimate market share. To this end, they have developed various models of vehicle type choice. However, most published studies of vehicle type choice concentrate on vehicle attributes, household and primary driver characteristics, and brand loyalty. There is little open literature on vehicle type choice focusing on customers' vehicle type preference and the factors affecting this preference.

For example, Farley Katz and Lehmann (1978) stated that the determinants of car purchase

decision include resale value, mileage, quality and reliability, price, and acceleration capability. Mittal, Ross Jr. and Baldasare (1998) stated that the determinants of car purchase decision include comfort and ease of getting in and out of vehicle, among other factors. Choo Sangho and Patricia Lyon Mokhtarian (2004) stated that the determinants of car purchase decision include travel attitude, personality, and lifestyle factors (there are undoubtedly numerous proprietary studies of the role of these factors in vehicle type choice). Peters Gutscher and Scholz (2011) stated that fuel consumption is a determinant of car purchase decision.

### **Assessment Items**

The AHP method, developed by Saaty (1977, 1991, 1999), is a multi-criterion decision-making method (of the third family mentioned in the last section) permitting the prioritization of alternatives. As underlined by Saaty (1980), the AHP permits the integration of both quantitative and qualitative aspects of decision-making, which makes it an efficient and effective method for complex contexts. The AHP is based on the use of pairwise comparisons, which leads to the elaboration of a ratio scale. Saaty recommends against decomposing the problem into more than seven criteria when decomposing an objective. This recommendation is mainly based on the brain's inability to manage the high structural complexity resulting from the inclusion of too many objects because of decomposition (an empirical rule indicates that it is not possible to manage over seven children per object up to three levels of decomposition).

In the AHP, the decision problem is organized in a hierarchical structure of objectives, criteria, and sub-criteria (see the review of applications

in Vaidya and Kumar, 2006). Tackling the whole hierarchy is a further challenge at the individual and especially group level (e.g., Srdjevic and Srdjevic, 2013). According to previous studies, the priority of assessment factors can vary according to the automobile type. AHP has been applied to multiple situations. This study was based on a previous study, and a hierarchy was constructed using a brainstorming method. As a result, the key factors include price, performance, stability, brand-image, and serviceability. Sub-criteria of price include purchase price, maintenance cost, scrap value, and political support. Sub-criteria of performance include speed, durability, fuel efficiency, emission, and comfort. Sub-criteria of stability include firmness of car body, quality and quantity of air bags, and safe, quick braking. Those of brand-image include the car manufacturer’s reputation and design. Meanwhile, those of serviceability include ease of driving, convenient facilities, and utilization ratio of space.

The hierarchical composition of factors in deciding to purchase a car can be defined as in Table 1. The main criteria are comprised of five factors, while the sub-criteria are comprised of 17 elements.

**ANALYSIS RESULTS**

Utilizing AHP, we can obtain a satisfying solution, even from an extremely small sample size. This can be achieved because the AHP model itself deletes irrational response(s), i.e., ‘CR < 0.10’, and one of characteristics of the AHP approach is that it can be based on the judgments of experts. It is important to select experts who are suitable for the objective of the questionnaire. Here, the consistency ratio (CR) was calculated as follows:

| Table 1: Evaluation Criteria |                                |
|------------------------------|--------------------------------|
| Criteria                     | Sub-criteria                   |
| Price                        | Purchase price                 |
|                              | Maintenance cost               |
|                              | Scrap value                    |
|                              | Government funding policy      |
| Performance                  | Speed                          |
|                              | Durability                     |
|                              | Fuel efficiency                |
|                              | Emission                       |
|                              | Comfort                        |
| Stability                    | car body firmness              |
|                              | quality and number of air bags |
|                              | quick braking                  |
| Brand-image                  | Brand reputation               |
|                              | Brand Design                   |
| Serviceability               | ease of driving                |
|                              | convenient facilities          |
|                              | Space utilization              |

$$CR = CI/RI \dots(1)$$

$$CI = (\lambda_{max} - n)/(n-1)$$

RI is a random index depending on the order of the matrix (Satty, 1980). When CR was less than 0.10, the matrix had reasonable consistency; in all other cases, it had unreasonable consistency.

This study conducted surveys from April 1, to December 25, 2014 with people who own cars, automobile dealers with sufficient knowledge and understanding of cars, and professional drivers involved with corporations in China. This study used Expert Choice 11.5 software. In total, 267 of the 337 surveys collected satisfy the logical

| Table 2: Analysis Results |        |                                |      |      |      |      |                           |      |      |      |      |      |
|---------------------------|--------|--------------------------------|------|------|------|------|---------------------------|------|------|------|------|------|
| Criteria: W1              |        | Sub-criteria: W2               |      |      |      |      | Overall importance: W1*W2 |      |      |      |      |      |
|                           |        |                                | A    | B    | C    | D    | E                         | A    | B    | C    | D    | E    |
| price                     | A:0.14 | Purchase price                 | 0.33 | 0.25 | 0.29 | 0.45 | 0.21                      | 0.05 | 0.05 | 0.03 | 0.16 | 0.02 |
|                           | B:0.20 | Maintenance cost               | 0.37 | 0.25 | 0.32 | 0.16 | 0.52                      | 0.05 | 0.05 | 0.04 | 0.06 | 0.04 |
|                           | C:0.12 | Scrap value                    | 0.14 | 0.25 | 0.24 | 0.29 | 0.15                      | 0.02 | 0.05 | 0.03 | 0.1  | 0.01 |
|                           | D:0.35 | Government funding policy      | 0.16 | 0.25 | 0.15 | 0.1  | 0.12                      | 0.02 | 0.05 | 0.02 | 0.03 | 0.01 |
|                           | E:0.08 | SUM                            | 1    |      |      |      |                           | 0.14 | 0.2  | 0.12 | 0.35 | 0.08 |
| Performance               | A:0.21 | speed                          | 0.34 | 0.2  | 0.15 | 0.09 | 0.12                      | 0.07 | 0.04 | 0.03 | 0.03 | 0.03 |
|                           | B:0.20 | durability                     | 0.18 | 0.2  | 0.14 | 0.06 | 0.08                      | 0.04 | 0.04 | 0.03 | 0.02 | 0.02 |
|                           | C:0.21 | fuel efficiency                | 0.21 | 0.2  | 0.32 | 0.26 | 0.49                      | 0.05 | 0.04 | 0.07 | 0.08 | 0.11 |
|                           | D:0.29 | Emission                       | 0.11 | 0.2  | 0.19 | 0.55 | 0.17                      | 0.02 | 0.04 | 0.04 | 0.15 | 0.04 |
|                           | E:0.22 | Comfort                        | 0.16 | 0.2  | 0.21 | 0.04 | 0.14                      | 0.03 | 0.04 | 0.04 | 0.01 | 0.02 |
|                           |        | SUM                            | 1    |      |      |      |                           | 0.21 | 0.2  | 0.21 | 0.29 | 0.22 |
| Stability                 | A:0.40 | car body firmness              | 0.3  | 0.33 | 0.25 | 0.73 | 0.37                      | 0.12 | 0.07 | 0.12 | 0.18 | 0.17 |
|                           | B:0.20 |                                |      |      |      |      |                           |      |      |      |      |      |
|                           | C:0.45 | quality and number of air bags | 0.29 | 0.33 | 0.39 | 0.07 | 0.33                      | 0.12 | 0.07 | 0.17 | 0.02 | 0.15 |
|                           | D:0.25 | quick braking                  | 0.41 | 0.34 | 0.36 | 0.2  | 0.3                       | 0.16 | 0.06 | 0.16 | 0.05 | 0.13 |
|                           | E:0.45 | SUM                            | 1    |      |      |      |                           | 0.4  | 0.2  | 0.45 | 0.25 | 0.45 |
| Brand-image               | A:0.10 | Brand reputation               | 0.64 | 0.5  | 0.69 | 0.8  | 0.8                       | 0.06 | 0.1  | 0.07 | 0.06 | 0.08 |
|                           | B:0.20 |                                |      |      |      |      |                           |      |      |      |      |      |
|                           | C:0.10 |                                |      |      |      |      |                           |      |      |      |      |      |
|                           | D:0.08 | Brand Design                   | 0.36 | 0.5  | 0.31 | 0.2  | 0.2                       | 0.04 | 0.1  | 0.03 | 0.02 | 0.02 |
|                           | E:0.10 | SUM                            | 1    |      |      |      |                           | 0.1  | 0.2  | 0.1  | 0.08 | 0.1  |
| serviceability            | A:0.15 | Ease of driving                | 0.33 | 0.33 | 0.44 | 0.38 | 0.56                      | 0.05 | 0.07 | 0.05 | 0.01 | 0.08 |
|                           | B:0.20 |                                |      |      |      |      |                           |      |      |      |      |      |
|                           | C:0.12 | Convenient facilities          | 0.45 | 0.33 | 0.32 | 0.22 | 0.29                      | 0.07 | 0.07 | 0.04 | 0.01 | 0.04 |
|                           | D:0.03 | Space utilization ratio        | 0.22 | 0.34 | 0.24 | 0.4  | 0.15                      | 0.03 | 0.06 | 0.03 | 0.01 | 0.03 |
|                           | E:0.15 | SUM                            | 1    |      |      |      |                           | 0.15 | 0.2  | 0.12 | 0.03 | 0.15 |

Note: A: Small, B: semi-mid size, C: Mid-size, D: Large, E: SUV.

consistency (below CR 0.10). The results for the importance perception of automobile purchase

decision-making factors by preferred automobile type for Chinese consumers are presented in Table 2.

Consumers who prefer small automobile considered quick braking to be the most important factor and scrap value and government funding policy to be less important. Consumers who prefer semi-mid-size automobile prioritized firmness of car body, quality and number of air bags, ease of driving and convenient facilities and placed less importance on performance sub-criteria. Consumers who prefer semi-mid-size automobiles considered quality and number of air bags to be the most important factor and government funding policy to be less important. For those who prefer large automobiles, firmness of car body, purchase price and emissions are the most important factors, whereas comfort and serviceability sub-criteria are less important. Consumers preferring SUVs considered car body firmness; the quality and number of air bags; quick braking; and fuel efficiency to be the most important factors and scrap value and government funding policy to be less important.

## CONCLUSION

China is the largest automotive market of the world. To obtain results with value for both Chinese consumers and carmakers around the world, this study has conducted an actual analysis by preferred car type, and the results are as follows.

Consumers who prefer small automotives consider quick braking to be the most important factor and give less weight to scrap value and government funding policy. Consumers who prefer semi-mid-size automotives consider stability and serviceability to be the most important factors and consider performance factors to be less important. Consumers who prefer mid-size automobiles consider the quality and number of air bags; quick braking; and firmness of car body

to be the most important factors and consider government funding policy to be less important. Those who prefer large automotives consider firmness of car body, purchase price, emissions, and scrap value to be the most important factors and consider serviceability less important. Consumers who prefer SUVs consider firmness of car body; the quality and number of air bags; quick braking; and fuel efficiency to be the most important factors and scrap value and consider government funding policy to be less important.

In summary, the results of this study reveal the purchase tendencies of existing and potential Chinese consumers based on their expectations of automobile functions and options and prioritization of important factors considered when purchasing an automobile, i.e., expected value for money. Therefore, this study will be valuable for both Chinese consumers and carmakers around the world. Furthermore, this study result provides important and reliable information for identifying the purchase tendencies of Chinese consumers to carmakers trying to expand to the Chinese market.

The first limit of this study was not securing the ideal sample volume due to the nature of the survey targets. Despite conducting the survey over a 9-month period, it was very difficult to interview drivers while in motion; therefore, new participants were referred by participants who had already completed the interviews. Second, the study could not identify the existence of differences based on the location, age, preferred engine, income and social position of participants and their causes. Therefore, secondary studies are recommended to accurately reflect the perceptions of existing and potential Chinese consumers toward automobile purchase factors and identify their causes.

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