

Influences of Income on Luxury Products Consumption

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Abstract: This report is aimed to investigate the influences of incomes on consumers' consumption and demands of luxury vehicles in China. This study uses the summary of the sales performance of these four brands in China in each year to represent the sales performances of luxury vehicles in China. This report uses the units sold to represent the sales performances. This study uses the national data from the Chinese National Bureau of Statistics to collect the average disposable income data to represent the income conditions of Chinese consumers. Based on secondary data collected about the sales performances of luxury vehicles and disposable income conditions of Chinese consumers, this study found that incomes have huge influences on consumers' demands of luxury vehicles. Just as expected by theory, the income elasticity of demand for luxury vehicles is larger than 1. In China, as the increasing incomes of consumers, the demands of luxury vehicles are also increased and the percentages of increase in demands are larger than the percentages of increase in incomes. Moreover, this study found that the negative expectation of consumers to future incomes also seriously influence the demand of luxury vehicles.

Keywords: income, luxury vehicles, Chinese consumers

1. Introduction

With the rapid economic growth of China, the urban population continues to increase and the middle-class consumers groups in China continue to mature. The number of luxury goods consumers in China had increased significantly. Consumption as one of the driving forces for economic growth grew rapidly due to the opening of the market. At present, Chinese Mainland has become the second largest consumer of luxury goods in the world, only after America. Among the major cities in the mainland, Shanghai ranks first and Beijing ranked second. According to the estimation of China Brand Strategy Association, luxury consumers in Chinese Mainland now account for 20% of the total population, which reached about 260 million people. Some scholars estimate that, there are 3 million people with private property of more than 10 million yuan in China. At present, China's personal savings deposits in banks are about 14 trillion yuan. And 80% of the 14 trillion yuan is owned by 20% families. These families could enjoy luxury goods. As the rapid development of luxury markets in China, the luxury vehicle industry is also in quick growth. The luxury vehicle market is expected to reach the CAGR of more than 3 percentages in the forecast period 2022 to 2027 (Research and markets. com, 2022). The market was valued at the amount of 160 billion USD in 2021 and it was predicted to reach USD 175 billion before 2027. as the economy becomes recovered from COVID-19, consumers demand for luxury vehicles are also increased.

In terms of the definition of luxury goods, many previous studies have tried to define luxury goods. Fan and Zheng defined that luxury goods refer to such products and services, which are better than other products and services in the same category and make consumers fascinated [1]. These goods are expensive while it is not so expensive as to be unreachable. Lewbel et al. defined Luxury goods as a kind of consumer goods that beyond the scope of people's survival and development needs [2]. They are unique and rare and are commonly known as "non necessities of life". From the perspective of Economics, luxury goods refer to the products with the highest ratio of value and quality or intangible value to tangible value. A comprehensive view of luxury consumption behavior and consumption psychology can show that luxury consumption has the following three characteristics: firstly, it has strong demand income elasticity. In addition, it is different from necessities. The demand income elasticity of luxury goods is greater than 1. That is, the growth rate of its demand is greater than the growth rate of its income, namely

$$E = \left(\frac{dx}{di} * (I/x) \right) > 1 \quad (1)$$

Where dx is the demand change, di is the income change and E is the demand income elasticity) represents the demand income elasticity of luxury goods. This shows that the consumption of luxury goods is flexible.

In addition, Pierre-Yves, and Katsumata argued that for consumers who buy luxury goods, its utility is not only related to the purchase quantity but also affected by the price of luxury goods [3]. Shin Eastman, and Li used utility function represents the utility function of luxury goods [4].

Moreover, Xiao-Lan et al. pointed out that the luxury consumers are usually in small groups. The consumer group is small. At present, luxury consumption is driven by the middle class and more affluent consumers. Such consumers account for about 10% - 15% of the total population [5]. In addition, Kowalczyk and Mitchell argued that Consumers tend to buy goods to meet their higher-level dual psychological needs of combining practicality and ostentation [6]. This shows that luxury products belong to the normal goods and consumers tend to purchase luxury goods to satisfy their own needs.

From the relationship between income increase and demand increase, Li Liang and Cheng divided people's consumer goods can generally into three categories: One is the necessity that has a corresponding development relationship between the increase of demand and the increase of income [7]. One type is inferior products whose demand increases with the increase of income. The other category is luxury goods where the increase in demand exceeds the increase in income. With the economic growth and the improvement of income level. The nature of these three kinds of goods changes. That is, today's Luxuries will become tomorrow's necessities and today's inferior goods were yesterday's necessities. To some extent, the transformation of luxury goods into necessities is a manifestation of the improvement of economic level and Living welfare. For example, in the low-income development stage, food and clothing are necessities of people's life, accounting for most of the daily expenditure. Housing, transportation, education, medical treatment, and environment are luxuries of daily life [8]. However, as income increases, the proportion of the latter part of people's consumption structure will increase significantly and the proportion of the former part will be significantly reduced. As a result, the relationship between luxury goods consumption and income increase are not absolute. It is important to investigate the relationship between the average incomes increase and luxury vehicle consumption in current China. Moreover, COVID-19 also has negative influences on the economy and incomes of consumers in China. This study also wants to investigate how COVID-19 influences the luxury vehicle consumption in China.

2. Methodology

This report chooses Mercedes-Benz, BMW, Porsche, Audi sales performances in China as representation of luxury vehicles sales performance since the top five most popular luxury vehicle brands in China are Mercedes-Benz, Tesla, BMW, Porsche, Audi. Tesla is not chosen since it is an electronic new energy vehicle and its sales performances are more likely to be influenced by people's thoughts and government policies about the new energy vehicles [9]. The reason why the data was collected from these four most popular luxury brands is that the economic instability caused by the epidemic in recent years is more evident in these four brands. The other smaller brands' sales performances are more likely to be influenced by their own marketing strategies. Since these four brands are the most popular brands, their sales performances can better represent the general market conditions in China. This report obtained official open data from the brands, including sales by geography and by model for each year worldwide [10]. These four brands are chosen also because they are the most well-known of the luxury cars and therefore have more reliable data to support the data analysis of this study. Official data for the five years from 2016 to 2021 were chosen to better analyze the relationship between the income levels and the luxury vehicles sales performances and the regional distribution in recent years, as well as the impact of incomes on the car sales of these brands before and after the epidemic.

This study uses the summary of the sales performance of these four brands in China in each year to represent the sales performances of luxury vehicles in China. This report uses the units sold to represent the sales performances.

This study uses the national data from the Chinese National Bureau of Statistics to collect the average disposable income data to represent the income conditions of Chinese consumers [11]. The reason to use the disposable incomes are that they are the additional incomes of consumers after deducting the basic life expenditure. This data can better represent the income increase.

Then, this study uses the following formula to calculate the income elasticity of demand. This study calculates the demand change by dividing the sales units in the next year to the previous year and then dividing the income changes in the next year to the previous year. This study will compare this figure with 1 to show whether the income elasticity is elastic or not.

3. Results and Discussion

3.1. Demands of Luxury Brands Vehicles in China

Table 1: Sales performances of four brands from 2017 to 2021. (data source: Mercedes-Benz, 2022; BMW, 2022; Porsche, 2022, Audi, 2022)

	2017	2018	2019	2000	2021
Mercedes-Benz	612,298	672,194	764,312	772,210	815,691
BMW	690,215	721,309	753,029	742,109	758,863
Porsche	301,972	349,217	382,640	291,296	402,182
Audi	648,310	682,921	704,309	719,209	751,289
Summary	2252795	2425641	2604290	2524824	2728025

From table 1 and figure 1, it can be found that all these four brands showed the trend of continuous increasing sales performance from 2017 to 2020. However, due to the negative influences from COVID-19, the sales performances were affected in 2020. the sales performances of BMW were decreased under the negative influences of economic depression due to the COVID-19 as well as the negative expectation of consumers to the future income conditions. The other three brands

showed slow growth. From 2020 to 2021, as the economy recovered, the sales performances were also increasing.

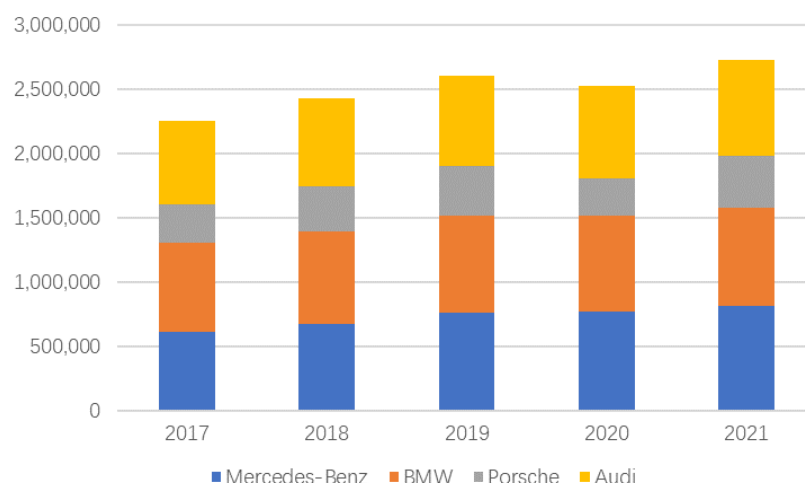


Figure 1: Sales performances of four brands from 2017 to 2021.

3.2. Average Disposable Incomes in China

From table 2 and figure 2, it can be found that the disposable incomes condition of Chinese residents showed continuous growth from 2017 to 2021 while there are decreased growth from 2019 to 2020, most likely to be influenced by COVID-19.

Table 2: Average disposable incomes in China from 2017 to 2021. (source: Stats.gov.cn, 2018-2021)

	2017	2018	2019	2020	2021
Average disposable incomes	21920	26651	30716	32189	35128
Sales(unit)	2252795	2425641	2604290	2524824	2728025

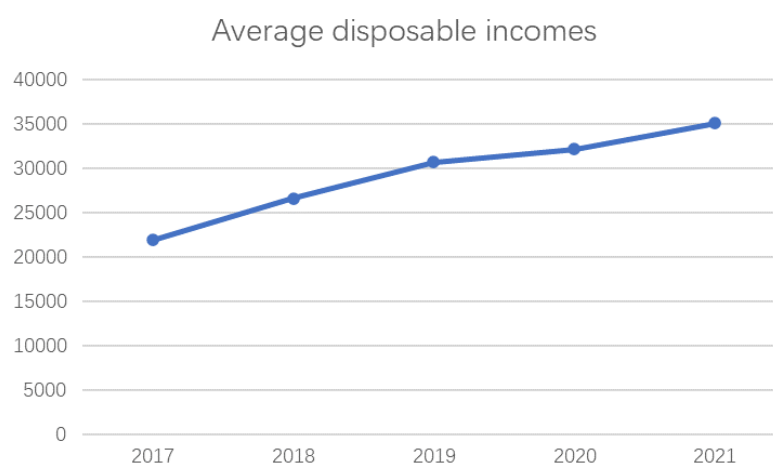


Figure 2: The average disposable incomes in China from 2017 to 2021.

3.3. Relationship Between the Income Conditions and Sales Units of Luxury Vehicles

The above figure 3 shows that there is a nearly linear relationship between the sales units and the sales performances. A regression analysis is conducted to regress sales units on income levels. R^2 is equal to 0.927, which shows that this model can explain 92.7 percentages of changes in the sales performances of the luxury vehicles. As a result, income can strongly explain the sales performances and demands conditions of consumers to luxury vehicles.

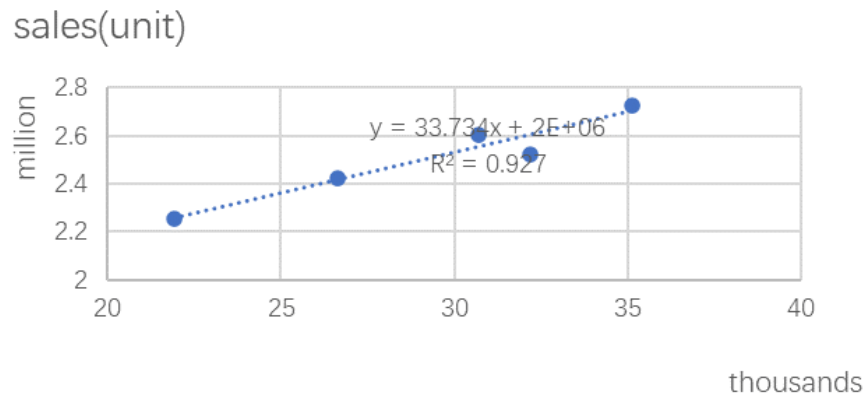


Figure 3: Relationship between the sales performance and average disposable incomes in China from 2017 to 2021.

3.4. Income Elasticity of Demand

The following table calculates the income elasticity of demand using the demand change and income changes from 2017 to 2018, from 2018 to 2019, from 2019 to 2020, from 2020 to 2021, and from 2021 to 2022.

Table 3: Income elasticity of demand for luxury vehicles.

	2017-2018	2018-2019	2019-2020	2020-2021
sales changes	172846	178649	-79466	203201
income changes	4731	4065	1473	2939
Income elasticity of demand	2.491	1.929	-1.454	1.123

This above table shows that except or yea 2019 to 2020, all income elasticity of demand is large than 1. The demand is elastic to incomes. Per one percentage of income change, the luxury vehicle sales performances change more than one percentage of income change. The result is in line with previous study, which shows that the luxury products have high income elasticity. According to the income elasticity of demand in western economics, normal goods in consumer goods can be divided into necessities and luxuries. As a normal product in the consumer goods, when the income rises, the demand for luxury goods and necessities will increase, but the increase range is different. Because of the lack of elasticity of necessities, the increased demand is limited, while because of the elasticity of luxuries, the increased demand is much more than that of necessities. Engels curve shows that with the increase of income, the consumption of necessities shows an upward trend, but the slope of the increase of consumption necessities is smaller than that of the increase of income; With the increase of income, the consumption of luxury goods also shows an upward trend, but the slope of consumption of luxury goods is greater than that of income. Therefore, Engel's law believes that with the increase of income, the consumption of necessities and luxury goods will in-

crease, but the proportion of necessities in the consumption expenditure is getting smaller and smaller, and the proportion of luxury goods consumption is getting larger and larger.

According to Maslow's demand hierarchy theory, people's demand gradually increases from low to high. After meeting the demand of the lower level, they will pursue the development of the demand of the higher level. According to the above theory, with the development of economy and the increase of income, the demand for necessities will gradually become saturated, and the space for growth is limited. Even if the income increases, the demand for necessities will not decrease, let alone increase with the increase of income; However, luxury goods are different. As a special commodity, its supply and demand change law are obviously different from that of general commodities. With the increase of income, people will develop toward the spiritual level, that is, the demand for self-realization, after meeting the basic level of demand. Therefore, the demand for luxury goods is growing continuously. It is the natural product of the development of contemporary society and the result of Chinese people's pursuit of a better quality of life as they enter a well-off life. The per capita GDP exceeded US \$1000, and the consumption structure has been upgraded from the type of food and clothing to the type of development and enjoyment. The economic growth has opened the door to luxury consumption. The per capita GDP has exceeded US \$3000, the process of urbanization and industrialization will be accelerated, and the industrial structure and consumption type will also be significantly changed.

According to international practice, with the development of economy, the growth rate of luxury consumption in a country is twice that of income. This is very beneficial to the development of our country in the transition period. In the transformation from export driven economic growth to expanding domestic demand driven economic growth, luxury consumption is a new engine of economic development. The growing demand for luxury goods consumption has a great impact on China's industrial structure adjustment and economic growth.

It is interesting that in year 2019 to 2020, although the income level increased by a small level, the luxury vehicle demand decreases. This may be due to that the COVID-19 has negative influences on consumer's expectation of the future incomes. As a result, when income growth decreased and the expectation of future incomes decreased, consumers' consumption of luxury goods tends to decrease significantly.

This finding is in line with previous results. Just as shown in the study of Siepmann et al., the expectation of future income has huge influences on the luxury products consumption as the negative expectation of the future incomes tend to make people save money and decrease their non necessary consumption.

4. Conclusion

In summary, this paper is aimed to investigate the influences of incomes on consumers' demands of luxury vehicles in China. This study found that incomes have huge influences on consumers' demands of luxury vehicles. Just as expected by theory, the income elasticity of demand for luxury vehicles is larger than 1. in China, as the increasing incomes of consumers, the demands of luxury vehicles are also increased. Moreover, this study found that the negative expectation of consumers to future incomes also seriously influence the demand of luxury vehicles.

However, this paper also has some limitations. This study only investigates incomes as the only factor with influence on the luxury vehicle demand conditions. Other factors like the government policies, ownership of vehicles will also influence the demand conditions. For example, when the luxury vehicle market tends to be mature, namely when all middle class and high-income consumers in the country all have luxury vehicles, they are not likely to purchase additional ones. In addition, this study does not consider Tesla, the brand of an electric vehicle brand. The electric vehicle is a substitute of the traditional fossil fuel vehicles and in recent years, due to the government poli-

cies to support the development of electric vehicles and new energy vehicles, more consumers tend to choose luxury vehicle brands of electric vehicles. They are less likely to choose fossil fuel vehicle brands. As a result, these factors will also influence the luxury brands consumption. This study does not consider these influences.

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