

# The Value of Second-hand Basic Passenger Vehicles Based on Factor Analysis

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**Abstract.** Contemporarily, applications of big data analysis have been implemented to many fields, and the discussion on its theoretical concept and application value is unprecedented. The financial sector is also actively promoting digital construction. To be specific, the construction of financial digitalization is conducive to breaking the drawbacks of traditional accounting, realizing the deep integration of business and finance, and improving the work and efficiency of accounting. Moreover, with China's economic development, the private car ownership will maintain a strong growth momentum. In this paper, we investigate the value of secondhand basic passenger vehicles based on factor analysis. Specifically, data of used cars is used to analyze the influencing factors of second-hand car price. According to the analysis, it is concluded that the used car price factors are Performance factor, time factor and manipulation factor. Moreover, sellers should establish a service system to ensure the quality of second-hand cars and make a reasonable price. These results shed light on guiding further exploration of setting reasonable prices for used cars.

**Keywords:** Used cars; Factor analysis; Reasonable prices.

## 1. Introduction

Contemporarily, in the development process of big data, its application value has spread to more and more fields, and the discussion on its theoretical concept and application value has been unprecedentedly heated [1]. At present, big data has been written into relevant policies, and the research and application of each major subdivided field have been constantly improved. In 2018, policies related to big data have penetrated various subsectors, strengthening the application of large data technologies. Meanwhile, the financial sector is also actively promoting digital construction. The construction of financial digitization is conducive to breaking the disadvantages of traditional accounting work, realizing the deep integration of business and finance, and improving the work and efficiency of accounting work [2].

With the economic development of China, private vehicle ownership will maintain a strong growth momentum, driven by this factor, China's second-hand car trading also began to be active. So far, the second-hand car market in China is in the key period in the transition from the initial starting period to the growth period. At the same time, the second-hand car market construction problems also began to stand out. The application of big data can help us build a more perfect market system [3]. Sun cited the research problems of smart retail in physical retail industry under the environment of big data, and combined with analysis, found that many physical retail enterprises began to try smart retail [4]. However, due to the lack of new concepts and new digital technologies as well as offline and online channels, traditional product strategies and marketing strategies are no longer applicable. The brick-and-mortar retail industry needs to break away from outdated concepts, introduce new digital technologies, improve the consumer shopping experience, and implement product strategies and advertising strategies based on big data. Cheng cited the problem of big data fusion analysis of cosmetics sales, and used the method of factor analysis calculation and regression analysis. He found that although big data features (e.g., weather and air) will bring changes to the sales of cosmetics enterprises, the impact degree of store sales is not obvious [5].

In order to build a smart second-hand car market, and to give second-hand car consumers some suggestions, this paper will put forward several factors affecting trading volume through factor analysis method. Suggestions will be given based on this paper. The rest part of the paper is organized as follows. The Sec. 2 will introduce the data and method. The Sec. 3 will introduce empirical analysis. The Sec.4 will introduce countermeasures and suggestions. The Sec.5 will demonstrate Limitation and prospects. Eventually, a brief summary is given in Sec. 6.

## 2. Data & Method

The place established by the used motor vehicle trading center in accordance with the law to provide the buyers and sellers with centralized trading services and related services for second-hand cars may be either an intermediary service provider or a commodity operator. Second-hand car transaction refers to the second-hand car Commodity Exchange and property rights transaction between buyers and sellers, as the government implements for motor vehicles. Strict management, second-hand car property rights can only be converted in the second-hand car market. Therefore, the second-hand car property rights trading market is established to meet the needs of second-hand car property rights flow, and its main business is to accept the entrustment of both parties, broker the transaction between buyers and sellers, and examine the legality of second-hand car transactions and property rights conversion. Common second-hand car trading market, second-hand car operating companies, second-hand car replacement companies, second-hand car brokerage companies and brokers. Among them, second-hand car brokerage companies and brokers can only carry out second-hand car dealmaking in the second-hand car market.

Factor analysis is the generalization of principal component analysis [6-8]. Nowadays, people have applied factor analysis to psychology, medicine, meteorology, geology, economics and other fields, making the theory and methods of it. For a specific problem studied, the original variable can be decomposed into the form of the sum of two parts, one is a linear function of a few unmeasurable common factors, and the other is a special factor independent of the common factor. Supposing there are P original variables, which are represented by  $x_1$  to  $x_p$ , respectively, where  $x_i$  ( $i=1, 2, \dots, p$ ) is a standardized variable with a mean of zero and a standard deviation of 1, and  $F_1$  to  $F_m$  represent m factor variables respectively, and m should be less than p:

$$x_i = \sum_{j=1}^m a_{ij}F_j + \epsilon_i \quad (1)$$

In this mathematical model, F is the factor variable or common factor, A is the factor load matrix,  $a_{ij}$  is the factor load, and it is the load of the  $i^{\text{th}}$  original variable on the  $j^{\text{th}}$  factor variable,  $\epsilon$  is a special factor. The following will apply factor analysis to study the factors that affect the value of second-hand cars.

## 3. Empirical Analysis

Primarily, we have three hypotheses, i.e., the odometer displays the actual mileage of the vehicle; all procedures for second-hand cars studied are complete and effective and the research object is mainly for cars. Through the analysis and screening of the collected data, 11 indicators are mainly used to influence the value of second-hand cars, which are: (1) X1 Used car price (unit: yuan); (2) X2 New car guide price (unit: yuan); (3) X3 driving kilometers (unit: 10000 kilometers); (4) X4 emissions; (5) X5 displacement (unit: L); (6) X6 Service time (unit: months); (7) X7 speed change (manual=0 automatic=1 manual automatic integration=2); (8) X8 maximum torque (unit: N · m); (9) X9 maximum power (unit: kW); (10) X10 maximum horsepower (unit: Ps); (11) X11 Fuel grade.

Table. 1 lists the correlation coefficient matrix. The table gives the correlation coefficients between the 11 variables. The price of second-hand cars has a strong correlation with the new car guidance price, displacement, engine capacity, maximum torque, maximum power and maximum horsepower. KMO test statistics are used to compare the correlation between variables by KMO and Bartlett

spherical test samples as given in Table. 2. The KMO test result shows that it is 0.815, which is greater than the threshold value of 0.5, satisfying the requirements of factor analysis. In addition, the Bartlett spherical test result shows that the significance is 0, i.e., at the level of 5% significance, the above indicators are suitable for factor analysis. Table. 3 presents the common factor variance. In this paper, the principal component extraction method is adopted by default to extract the factors of variables. The operation of factor extraction can effectively achieve the goal of dimension reduction, so as to achieve the effect of simplifying complex problems. Before extracting the common factor, the operating software uses the principal component extraction method to obtain the common factor variance results. According to the results, there is a linear correlation between each part of the variable. Table. 3 shows the information extracted from each original variable in the analysis, and the common factor contains at least 70% of the information of each variable.

**Table 1.** Correlation Matrix

|     | X1    | X2    | X3    | X4    | X5    | X6    | X7    | X8    | X9    | X10   | X11   |
|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| X1  | 1.000 | .980  | -.303 | .293  | .841  | -.273 | -.132 | .659  | .796  | .839  | .516  |
| X2  | .980  | 1.000 | -.284 | .307  | .902  | -.222 | -.150 | .754  | .865  | .904  | .554  |
| X3  | -.303 | -.284 | 1.000 | -.593 | -.250 | .659  | .024  | -.412 | -.347 | -.355 | -.220 |
| X4  | .293  | .307  | -.593 | 1.000 | .245  | -.699 | -.038 | .475  | .371  | .369  | .435  |
| X5  | .841  | .902  | -.250 | .245  | 1.000 | -.031 | -.262 | .770  | .838  | .870  | .391  |
| X6  | -.273 | -.222 | .659  | -.699 | -.031 | 1.000 | -.085 | -.346 | -.279 | -.290 | -.408 |
| X7  | -.132 | -.150 | .024  | -.038 | -.262 | -.085 | 1.000 | -.058 | -.104 | -.158 | .237  |
| X8  | .659  | .754  | -.412 | .475  | .770  | -.346 | -.058 | 1.000 | .927  | .926  | .637  |
| X9  | .796  | .865  | -.347 | .371  | .838  | -.279 | -.104 | .927  | 1.000 | .964  | .569  |
| X10 | .839  | .904  | -.355 | .369  | .870  | -.290 | -.158 | .926  | .964  | 1.000 | .574  |
| X11 | .516  | .554  | -.220 | .435  | .391  | -.408 | .237  | .637  | .569  | .574  | 1.000 |

**Table 2.** KMO and Bartlett's Test

|                                                  |                    |
|--------------------------------------------------|--------------------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | .815               |
| Bartlett's Test of Sphericity                    | Approx. Chi-Square |
|                                                  | df                 |
|                                                  | Sig.               |
|                                                  | 1016.667           |
|                                                  | 55                 |
|                                                  | .000               |

**Table 3.** Communalities

|     | Initial | Extraction |
|-----|---------|------------|
| X1  | 1.000   | .826       |
| X2  | 1.000   | .928       |
| X3  | 1.000   | .729       |
| X4  | 1.000   | .765       |
| X5  | 1.000   | .911       |
| X6  | 1.000   | .838       |
| X7  | 1.000   | .858       |
| X8  | 1.000   | .841       |
| X9  | 1.000   | .911       |
| X10 | 1.000   | .952       |
| X11 | 1.000   | .736       |

Table. 4 shows the characteristic root and variance contribution rate the interpretation of total variance is the result of factor extraction and factor rotation after factor analysis. The first four columns of data describe the interpretation of the initial solution of factor analysis to the original variable population. The general principle of extracting common factors is that the information loss cannot be too large. First, we can synthesize the judgment criteria that the eigenvalue is greater than

1, and the variance contribution is 84.501%. Therefore, the first three factors can be retained. Seen from the Fig. 1 that the inflection point appears at the third characteristic root, so the first three factors can be retained. Combined with the observation of the screen plot, the number of factors and characteristic values are more intuitively displayed. The horizontal axis is the number of common factors, and the vertical axis is the characteristic value. When the three common factors are extracted, the change of eigenvalue is obvious. The eigenvalue of the first three factors exceeds 1, and the graph is relatively steep, indicating that it has good interpretation. In general, according to the number of boundary zones from steep to gentle on the screen plot, it is appropriate. In order to make these indicators better explained and the significance of common factors obvious, this paper selects three common factors, with a variance contribution rate of 84.501%. Apparently, the variance contribution rate of the first common factor reaches 56.257%. It is the main factor affecting the value of second-hand basic passenger vehicles, and the other factors gradually weaken their influence on the value of second-hand basic passenger vehicles.

**Table 4.** Total Variance Explained

|    | Initial Eigenvalues |          |            | Extraction Sums of Squared Loadings |          |            | Rotation Sums of Squared Loadings |          |            |
|----|---------------------|----------|------------|-------------------------------------|----------|------------|-----------------------------------|----------|------------|
|    | Total               | Variance | Cumulative | Total                               | Variance | Cumulative | Total                             | Variance | Cumulative |
| 1  | 6.188               | 56.257   | 56.257     | 6.188                               | 56.257   | 56.257     | 5.519                             | 50.171   | 50.171     |
| 2  | 1.951               | 17.735   | 73.992     | 1.951                               | 17.735   | 73.992     | 2.541                             | 23.102   | 73.273     |
| 3  | 1.156               | 10.509   | 84.501     | 1.156                               | 10.509   | 84.501     | 1.235                             | 11.228   | 84.501     |
| 4  | .549                | 4.993    | 89.493     |                                     |          |            |                                   |          |            |
| 5  | .451                | 4.100    | 93.593     |                                     |          |            |                                   |          |            |
| 6  | .310                | 2.815    | 96.408     |                                     |          |            |                                   |          |            |
| 7  | .256                | 2.330    | 98.738     |                                     |          |            |                                   |          |            |
| 8  | .077                | .696     | 99.434     |                                     |          |            |                                   |          |            |
| 9  | .036                | .329     | 99.764     |                                     |          |            |                                   |          |            |
| 10 | .020                | .186     | 99.950     |                                     |          |            |                                   |          |            |
| 11 | .006                | .050     | 100.000    |                                     |          |            |                                   |          |            |

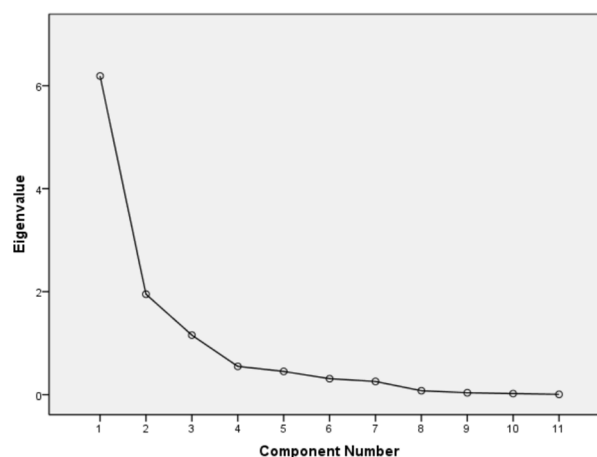
**Fig. 1** Screen Plot

Table. 5 is a non-rotating factor load matrix. There is no obvious difference in the load of the common factor on some original variables, so it is necessary to rotate. This table is the component matrix of factor analysis, also called factor load matrix. According to the component matrix, the following model of factor analysis can be written:

$$X_1 = 0.881F_1 + 0.224F_2 + 0.009F_3 \quad (2)$$

$$X_2 = 0.924F_1 + 0.270F_2 + 0.025F_3 \quad (3)$$

$$X_3 = -0.491F_1 + 0.623F_2 + 0.317F_3 \quad (4)$$

$$X_4 = 0.536F_1 - 0.665F_2 - 0.188F_3 \quad (5)$$

$$X_5 = 0.860F_1 + 0.401F_2 - 0.105F_3 \quad (6)$$

$$X_6 = -0.441F_1 + 0.796F_2 + 0.098F_3 \quad (7)$$

$$X_7 = -0.119F_1 - 0.314F_2 + 0.863F_3 \quad (8)$$

$$X_8 = 0.914F_1 + 0.007F_2 + 0.080F_3 \quad (9)$$

$$X_9 = 0.940F_1 + 0.160F_2 + 0.053F_3 \quad (10)$$

$$X_{10} = 0.959F_1 + 0.179F_2 + 0.009F_3 \quad (11)$$

$$X_{11} = 0.667F_1 - 0.216F_2 + 0.494F_3 \quad (12)$$

**Table 5.** Component Matrixa

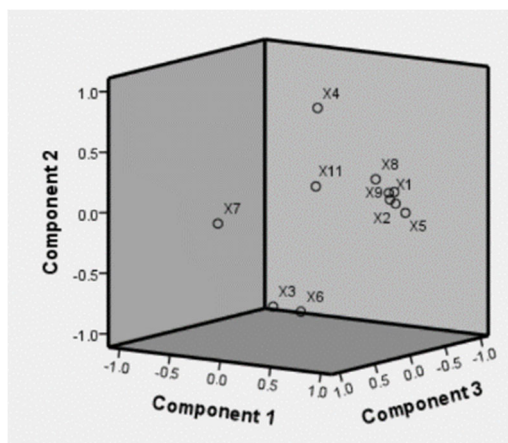
|     | 1     | 2     | 3     |
|-----|-------|-------|-------|
| X10 | .959  | .179  | .009  |
| X9  | .940  | .160  | .053  |
| X2  | .924  | .270  | .025  |
| X8  | .914  | .007  | .080  |
| X1  | .881  | .224  | .009  |
| X5  | .860  | .401  | -.105 |
| X11 | .667  | -.216 | .494  |
| X6  | -.441 | .796  | .098  |
| X4  | .536  | -.665 | -.188 |
| X3  | -.491 | .623  | .317  |
| X7  | -.119 | -.314 | .863  |

**Table 6.** Rotated Component Matrixa

|     | 1     | 2     | 3     |
|-----|-------|-------|-------|
| X2  | .955  | .121  | -.017 |
| X10 | .951  | .219  | -.004 |
| X5  | .936  | .019  | -.183 |
| X9  | .929  | .216  | .042  |
| X1  | .896  | .148  | -.021 |
| X8  | .848  | .331  | .113  |
| X11 | .569  | .308  | .564  |
| X6  | -.089 | -.897 | -.161 |
| X4  | .220  | .845  | .041  |
| X3  | -.184 | -.828 | .097  |
| X7  | -.162 | -.022 | .912  |

**Table 7.** Principal Factor and Variable

| Principal factor       | variable                                                                                             |
|------------------------|------------------------------------------------------------------------------------------------------|
| F1 Performance factor  | New car guide price, maximum horsepower, displacement, maximum power, used car price, maximum torque |
| F2 Time factor         | Service time, emissions, driving kilometers                                                          |
| F3 Manipulation factor | Variable speed, fuel grade                                                                           |



**Fig. 2** Component Plot in Rotated Space

To eliminate the impacts of loading value distribution of the common factor on the original variable is not obvious, this paper uses the maximum variance orthogonal to rotate the factor load matrix, so that the meaning of the common factor interpretation of each original variable is more clear, which is convenient for the interpretation and naming of factors. This table is the component matrix after rotation. Each value is the estimated load value of the rotation factor. Table. 6 shows the factor load matrix after rotation. It is obvious from the table that the first factor has a large load on the new car guide price, maximum horsepower, displacement, maximum power, used car price, and maximum torque, which are 0.955, 0.951, 0.936, 0.929, 0.896, and 0.848 respectively, indicating that these seven variables have a strong correlation, which are all internal parameter indicators of vehicles, and generally reflect the basic performance of used basic passenger vehicles, which are classified into one category and named as performance factors. The second common factor has a large load on the service time, emissions and driving kilometers, which is -0.897, 0.845 and -0.828 respectively, indicating that these three variables have a strong correlation. The common feature of these factors is that they have obvious characteristics in time, which to some extent is a simple and intuitive description of the new and old conditions of used basic passenger vehicles. The third factor has a large load on the variable speed and fuel grade, which are 0.912 and 0.564 respectively, indicating that these two variables have a strong correlation and fall into one category. According to its characteristics, it belongs to the attribute of the used basic passenger vehicle's manipulation mode, so this factor can be named as the manipulation factor.

From the load distribution of these 11 indicators on the three common factors, we can draw the following conclusions. The basic performance of used cars is the most important factor affecting their value, as is the case from the actual situation. Different technologies are used for each car, there will be a very large gap in the basic performance, which plays a decisive role in both the value of new cars and used cars. The second factor is time. Since the production time of each vehicle is different, the environmental protection standards they follow are also different. In addition, the longer the service time and driving mileage will be from the time when they are registered to use to the time when the second-hand basic passenger vehicles are sold, the more serious the consumption of the second-hand basic passenger vehicles will be to a large extent, which is also the most important factor for consumers in addition to the performance of the vehicle itself.

Fig. 2 is a scatter plot of factor loads after rotation. In this figure, the first factor and the third factor are taken as the horizontal and vertical axes respectively, and the second factor is taken as the height. Table. 7 is the factor score coefficient matrix. On the basis of the three common factors extracted, according to the score coefficient matrix, the relationship expression between the indicator variable and the extracted common factor can be obtained as follows:

$$F_1 = 0.176X_1 + 0.193X_2 + 0.073X_3 - 0.066X_4 + 0.200X_5 + 0.100X_6 - 0.020X_7 + 0.142X_8 + 0.175X_9 - 0.179X_{10} + 0.090X_{11} \quad (13)$$

$$F_2 = -0.047X_1 - 0.068X_2 - 0.389X_3 + 0.378X_4 - 0.098X_5 - 0.409X_6 - 0.083X_7 + 0.035X_8 - 0.025X_9 - 0.021X_{10} + 0.015X_{11} \quad (14)$$

$$F_3 = -0.020X_1 - 0.014X_2 + 0.164X_3 - 0.050X_4 - 0.142X_5 - 0.043X_6 + 0.759X_7 + 0.071X_8 + 0.025X_9 - 0.013X_{10} + 0.445X_{11} \quad (15)$$

**Table 7.** Component Score Coefficient Matrix

|     | 1     | 2     | 3     |
|-----|-------|-------|-------|
| X1  | .176  | -.047 | -.020 |
| X2  | .193  | -.068 | -.014 |
| X3  | .073  | -.389 | .164  |
| X4  | -.066 | .378  | -.050 |
| X5  | .200  | -.098 | -.142 |
| X6  | .100  | -.409 | -.043 |
| X7  | -.020 | -.083 | .759  |
| X8  | .142  | .035  | .071  |
| X9  | .175  | -.025 | .025  |
| X10 | .179  | -.021 | -.013 |
| X11 | .090  | .015  | .445  |

## 4. Countermeasures and Suggestions

### 4.1 Establish and Improve the System

Enterprises and industries need to establish a complete and standardized after-sales service system as soon as possible [9, 10]. In order to protect the rights and interests of consumers, warranty and after-sales service should be explicitly written in the sales contract, and the standardization of service should be constrained by the contract. The second-hand car operators in developed countries have provided good services for the extension of vehicle warranty and the replacement of important vehicle parts. Besides, they have taken meeting customer needs as the cornerstone of enterprise development. In addition, the operators of some brands of second-hand cars have their own insurance business, without consumer services. The domestic second-hand car market should learn how to improve after-sales service through insurance company guarantee. The circulation of second-hand cars needs management. If there is no management or the management method is inefficient, the circulation market will be confused. However, if the government departments are responsible for it, it will increase the workload of the government and may not be able to really understand the market situation. Therefore, the association of this industry should be the main management, and the government should regulate the market through policy formulation and auxiliary management.

Building a perfect second-hand car market service platform, an authoritative second-hand car evaluation report, is the key to obtaining the trust of consumers and solving the problem of asymmetric transaction information between consumer cars and dealers in the second-hand car market. Driven by the rapid development of the second-hand car market, we must build a second-hand car evaluation system in China. At this stage, the second-hand car transaction evaluation is mainly provided by dealers or brokerage companies themselves. Since it is linked to the profitability, the reliability of the evaluation is difficult to gain the trust of customers, and it is indeed easy to reduce the reliability of the evaluation. It affects the development of the whole market. Therefore, there must be an independent evaluation agency to provide the evaluation and detection report of the number of vehicles traded, so as to solve the problem caused by information asymmetry between consumers and operators. As an independent third-party institution, the evaluation institution also needs to have some authority, so to obtain the qualification of an evaluation institution, it must meet the relevant business license issued by the state. One can draw on some experience of similar land and real estate appraisal to classify the qualification level of second-hand car appraisal agencies, and specify their models according to the level. In addition, these evaluation institutions should be supervised and managed to

avoid interest cooperation between the evaluation institutions and second-hand car operators, which may affect the fairness of the evaluation.

#### **4.2 Ensuring Vehicle Quality**

The quality problem is the most concerned problem of consumers for each commodity. The quality of automobiles can directly affect the life safety of consumers [9]. In the early years, consumers could easily buy accident cars, water-soaked cars, etc. In recent years, electronic transaction models based on the Internet have sprung up. Buyers and sellers usually complete second-hand car transactions on the Internet. These legitimate second-hand car websites improve the quality of second-hand cars by strengthening the review of dealers' qualifications. In addition, the dealers' car sources that consumers have access to provide warranty and after-sales maintenance. This improvement enlivened the second-hand car market again. However, as a dealer, one still needs to set an example and be able to continuously ensure that the used cars one sell are strictly tested and checked, without potential safety problems and are sourced from formal channels

#### **4.3 Transparency of Transaction Information**

Although the quality problem of used cars is improving, the opacity of the market price of used cars still brings trouble to consumers. There is no manufacturer's guide price like new cars for used cars. All used cars are priced according to the condition of each car. There is no unified and perfect standard for the pricing right of each dealer and owner. Consequently, if the same used car is priced differently in different dealers, the gap between the two will be large, the primary reason for consumers to choose used cars is that the price is low. Therefore, dealers should set a reasonable price for used cars. If the price is too high, consumers will not directly feel the advantages of used cars over new cars, which will lead to transaction failure.

#### **4.4 Obtaining Government Support**

In addition to self-management, the second-hand car market also needs strong support from the government (e.g., relaxing the property right registration system), allowing second-hand car dealers to register, and facilitating second-hand car transactions; adjust VAT and encourage second-hand car trading. To transform and upgrade the second-hand car market, in addition to establishing a second-hand car online trading information platform, we will increase efforts to develop second-hand car brands, auctions, and replacement.

### **5. Limitation & Prospect**

This paper has got some conclusions, but there are still some shortcomings, and the following problems need to be further developed [7]. Further improve the value evaluation index system of second-hand household vehicles from the perspective of consumer behavior perception. In the second-hand car market, the intention of the car owners to sell their cars has a certain impact on the transaction price. The capital turnover is difficult, and the car owners who are in urgent need of funds will be anxious to sell their cars, which will increase the bargaining power of the car buyers. If the owner is not in a hurry to sell the car, the transaction price will be more objective. Due to the difficulties in data collection, this factor is not included in the selection of indicators in this paper. Later research can consider more factors in consumer behavior perception, including factors such as car owners' intention to sell cars into the indicator system, to improve the accuracy of the evaluation.

The sample size is expanded to improve the applicability of the model. The hedonic price model is based on the empirical analysis of a large number of data. This paper selects 78 data samples. Although the final fitting effect and evaluation accuracy are good, there are still problems such as incomplete automobile brands and models, and insufficient sample size. Therefore, the subsequent research can consider expanding the sample size to increase the applicability of the evaluation model. In addition, the factors affecting the price of automobile brands of different grades are also different.



The research in this paper does not distinguish the grades of second-hand household cars, where subsequent study can establish models by brands to improve the pertinence of the evaluation.

## 6. Conclusion

In summary, this paper discusses the value of used cars based on SPSS. The research purpose of this paper is to analyze and explore the influencing factors of the value of second-hand basic passenger cars. This paper selects the relevant data of second-hand cars from the authoritative automobile website "Huaxia Used Car Website", which lays a good data foundation for the research. This paper selects 11 main influencing factors and comprehensively analyzes their impact on the value of second-hand basic passenger vehicles. Based on the results, the main factor affecting consumer behavior in the second-hand car market is the performance factor. In order to ensure the smooth transaction of second-hand cars, second-hand car dealers should first ensure the quality of second-hand cars and eliminate consumers' concerns about the quality of second-hand cars. Secondly, the price of second-hand cars should be fair and reasonable. One of the main reasons why consumers choose second-hand cars is the low price of second-hand cars. If the price is too high and there is no obvious price advantage compared with new cars, consumers will be more inclined to choose new cars with higher cost performance when making purchase decisions, leading to the failure of second-hand car transactions. Thirdly, dealers should also rely on professional and authoritative evaluation institutions or scientific and reasonable evaluation systems to conduct scientific evaluation of second-hand cars. Besides, they ought to combine consumers' sensitivity to prices to jointly formulate prices that consumers can and are willing to accept. The time factor can have a positive impact on the satisfaction of consumers who buy second-hand cars. Consumers attach great importance to the dilapidation and practicality of second-hand cars. Finally, consumers pay much attention to the handling performance of second-hand cars. Thus, second-hand car dealers should strive to improve their product quality, service level and brand awareness according to the three public impact factors of consumer behavior to win the first opportunity to occupy the second-hand car market. Nevertheless, the experimental data in this paper are not large enough, and there may be some errors. Secondly, the number and types of collected variables are not enough. Thirdly, it is necessary to conduct subdivision research on consumer groups of different classes, such as the impact of consumer housing situation, consumption habits, life hobbies, family decision makers and other factors. Finally, it is necessary to consider the marketing strategies formulated for different groups. In the future, a good internal environment of used cars will be formed with the development of second-hand car. Overall, these results offer a guideline for setting reasonable used car prices.

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