Data Analysis of "Double Eleven" Shopping Section Based on Regression Model

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Abstract: The "Double Eleven" is dominated by commodity trading, and the large increase in the volume of transactions has an undeniable impact on the total retail sales of China's economic indicators. Combination of China statistical yearbook and Chinese commerce intelligence network site data, using E Views software, the "Double Eleven" volume and total retail sales of social consumer goods data modeling analysis, trading as explanatory variables, is social consumer goods as explained variable regression analysis. Through data analysis and testing, the model obtained a linear relationship between the two and presented specific data links, which further explained the contribution of "Double Eleven" to the total retail sales of consumer goods. Based on the data analysis, the corresponding suggestions are made to consumers.

Keywords:"Double Eleven"; Total Retail Sales of Consumer Goods; Linear Regression Model

I. INTRODUCTION

"Double Eleven" carnival, since 2009, November 11, became a crazy shopping day, consumers "Double Eleven" carnival shopping gradually became the largest in China's Internet sales promotion activity. The volume on the day of the "Double Eleven" has been breathtaking, with only a few years to go. What is the connection between the big data and the Chinese economy? In terms of economic indicators, what is the relationship between the "Double Eleven" transaction and the total retail sales of consumer goods? This paper makes a further study of this problem, the "Double Eleven" turnover as explanatory variables, is total retail sales of social consumer goods as the explained variable statistical modeling analysis[1], through EViews software to analyze data, data acquisition in Zhongshang intelligence network and China's statistics bureau. At the same time, this paper discusses its influence and makes some reasonable suggestions.

II. MODEL SETTING AND RESEARCH METHOD

2.1. Variable Selection

In order to study the "Double Eleven" the relationship between the volume and the total retail sales of social consumer goods, will be divided into variable to explain and be explained variables, the model, the explanation variable is the cause of the change, be explained variable is the result of the change. The "Double Eleven" trading volume (X) as the explanatory variable, The annual increase of transaction volume has a certain impact on the total retail sales of consumer goods.

And the influencing factors of total retail sales of social consumer goods is more, in this model, the total retail sales of social consumer goods is (Y) as the explained variable, can eliminate the unknown factors and the effect of all kinds of error and the main research volume change caused the change of the total retail sales of social consumer goods.

2.2. Data Selection

This article selects the total retail sales of social consumer goods(Y) in 2009-2016 data from the national bureau of statistics, the 2009-2016 "Double Eleven" transactions (X) is derived from Zhongshang intelligence agencies, through linear regression analysis, it is concluded that the linear relationship between them, according to explain and be explained variables between the number of regularity to establish regression model, and hypothesis testing.

Table 1.Total Retail Sales and Turnover Data of Consumer Goods

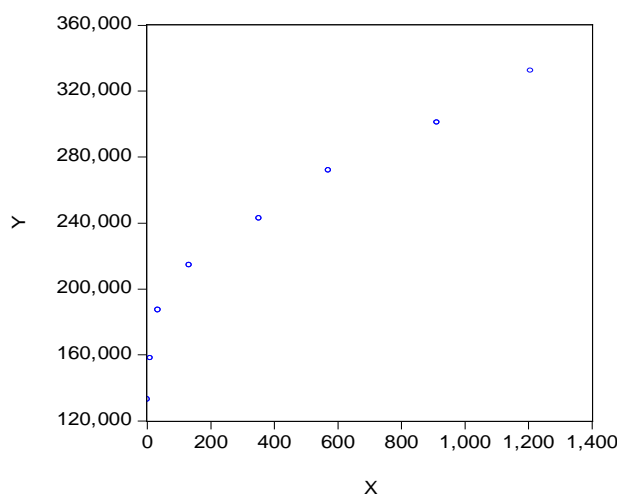| Year	Y/ Billion Yuan	X/ 100 Million Yuan
2009	133048.2	0.52
2010	158008	9.36
2011	187205.8	33.6
2012	214432.7	132
2013	242842.8	352
2014	271896.1	571
2015	300930.8	912
2016	332316.3	1207

2.3. Regression Analysis

Figure 2. Scatter Plot of Total Retail Sales and Turnover of Consumer Goods

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In order to facilitate the analysis of Y and X visually, the data in table 1 is the scatter plot of X and Y. It can be seen from the scattered chart that the total retail sales of consumer goods increases with the increase of transaction volume, which is approximately linear relationship, and there is a correlation between them.

2.4. Model Setting

By total retail sales of social consumer goods and scatter diagram of the total analysis of the total retail sales of social consumer goods along with the change of volume has a number of regularity, consider a linear regression model is as follows:

Dependent Variable: Y
Method: Least Squares
Date: 04/02/18   Time: 13:24
Sample: 2009 2016
Included observations: 8

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	171773.9	11415.24	15.04777	0
X	144.986	19.44453	7.456387	0.0003

R-squared	0.902594	Mean dependent var		230085.1
Adjusted R-squared	0.886359	S.D. dependent var		69771.21
S.E. of regression	23520.31	Akaike info criterion		23.18143
Sum squared resid	3.32E+09	Schwarz criterion		23.20129
Log likelihood	-90.72574	Hannan-Quinn criter.		23.04748
F-statistic	55.59771	Durbin-Watson stat		0.588603
Prob(F-statistic)	0.0003			

Figure 3. Regression Results

The parameter estimation and test results can be written in a canonical form:

$$\hat{Y}=171773.9+144.9860X_t$$
$$(11415.24)\ (19.44453)$$
$$t=(15.0478)\ (7.4564)$$
$$R^2=0.9026\ \ F=55.597\ \ n=8$$

2.6. Model Test

2.6.1. Economic Significance Test

Estimated $\hat{\beta}_1$=171773.9, $\hat{\beta}_2$=144.9860, shows a "Double Eleven" turnover every increase of 100 million yuan, the average total retail sales of social consumer goods increase of 14.4986 billion yuan, this accords with the actual economic significance, namely the increase of the turnover will lead to the growth of total retail sales of social consumer goods.

2.6.2. Goodness of Fit And Statistical Test

$$Y_t=\beta_1+\beta_2X_{t+}\varepsilon_t$$

Y to be explained variable total retail sales of social consumer goods, as explained variable X volumes, including 1 beta, beta 2 for regression coefficient, the other influence social total retail sales of consumer goods (Y) factors are included in the random error term I.

2.5. Estimation Parameters

Assuming that the proposed model and its random perturbation UI satisfy the classical assumptions, the parameters can be estimated by OLS method. The regression results of E Views are shown in figure 3.

The regression result shows that the run-off coefficient is 0.9026, shows that the model on the whole sample data fitting is very good, namely explain variables "transactions" to be explained "total retail sales of social consumer goods," explains most of the differences.

T test for regression coefficient: for $H_0:\beta_1=0$, and $H_0:\beta_2=0$, we can see from the regression results that the standard deviation and t value of the estimated regression coefficient are respectively: SE (1) =11415.24, t (1) =15.04777; The standard deviation and the t-value of t are: SE (2) =19.44453, t (2) =7.456387. The threshold value of the distribution table is n-2=8-2=6. Because t (1)= 15.04777>$t_{0.025}(6)$=2.447, so reject $H_0:\beta_1=0$; Because t(2)=7.456387>$t_{0.025}(6)$=2.447, so reject $H_0:\beta_2=0$. The significance test of the slope coefficient shows that the transaction volume has a significant impact on the total retail sales of consumer goods.

III. ANALYSIS OF FACTORS BEHIND THE DATA

3.1. Consumers' Psychological Factors

The conformity of consumer psychology certainly played a strong role in the increase of the volume, under the influence of environment on Friday, consumers always consciously or unconsciously follows the public, and even blindly make consumer choice, not rationally to consume. Near a "Double Eleven", the businessman's distinctive discounts to attract consumers, make consumers feel made cheaper, thus promoting the consumer consumption during the "Double Eleven" activity, is also on November 11, a minute of the day the main reason.

3.2. Development of Network Technology

Along with the development of Internet, e-commerce, online shopping convenience, real-time and quick rhythm life efficiency of shopping information to the younger generation of online shopping fondle admiringly, without considering all kinds of restrictions, such as weather, place, time can be anywhere at any time for shopping.

3.3. Guarantee of National Laws

Combined with China's national conditions, the state introduced a series of laws and regulations so as to perfect the security of e-commerce transactions, ensure the healthy and steady development of e-commerce, promote the electronic commerce is gradually mature and stable social environment. Consumers' rights and interests are guaranteed, eliminating consumer concerns.

3.4. Business Marketing Strategy

As the main marketing means of merchants, discount promotion attracts consumers, and the rich and colorful interface of discount activities strongly impacts consumers' vision and induces consumers' shopping desire. Small activities such as grabbing red envelopes, sharing deductions and vouchers to cash in cash stimulate consumers to spend. In addition, the combination of various applications influences the consumption behavior of consumers, leading consumers to consume blindly and follow the trend.

3.5. Application of Data Statistics

Statistics has entered every aspect of consumer daily life, when consumers in Taobao or Tmall software interface to search or browse the content of interest, the background will analyze its behavior and record, convenient for consumers to enter again quickly push consumers interested in content, in order to reach the purpose of sales promotion.

IV. SUMMARIES

The big data of "Double Eleven" online consumption not only indicates the consumption trend of the new era, but also highlights the rapid economic development of modern society. But in the fast pace of life, consumers should try to stay sane, understand their own needs, eliminate blind consumption, and avoid unnecessary waste.

Because of a "Double Eleven" started in 2009, the data is less, not on a large number of data based on the rigorous analysis, but the data model, this paper analyses the won't

have a big impact, in this paper, with the help of linear regression model, volume of a comprehensive analysis is made and the total retail sales of social consumer goods. The rising trend of online transactions will gradually occupy an important position in the increase of retail sales of consumer goods.

"Double Eleven" the sales volume of how the future will reach the height of the, consumers and businesses turn into what the most appropriate relationship between, on the other aspects of the national economy and what significant influence, needs to be fastidious.

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