Computer Software Aided Regression Analysis of Correlation between Internet Communication and Residents' Consumption

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Abstract. In this paper, we try to find out the correlation between internet communication and residents' consumption. Based on the objective, with a computer software aided method, we choose the annual statistic data of residents' consumption level and internet communication population of China from 2003 to 2013, and use econometrics software Eviews 6.0 and least square method to build the linear regression model between residents' consumption level and internet communication population. The result shows that there does exist a linear correlation between residents' consumption level and internet communication population.

Introduction

Recent 10 years, there are more and more people in China starting using the internet communication. Meanwhile, the residents' consumption level of China is becoming higher and higher. Theoretically, the higher the residents' consumption level is, the more people can afford the expense of internet communication. However, we still don't know that what correlation exists between residents' consumption level and internet communication population. Therefore, finding out the "black box" between residents' consumption level and internet communication population is necessary and essential.

This paper tries to use econometrics method to reveal the correlation between residents' consumption level and internet communication population, so it conducted the study in China. First, this paper got the related annual data from the website of China's National Bureau of Statistics. Then, with the use of the econometrics computer software-Eviews 6.0 and the least square method, this paper examined how residents' consumption level may affect internet communication population, which means, what correlation exists between residents' consumption level and internet communication population. Thus, this study to some extent contributes to open the "black box" between residents' consumption level and internet communication population.

Status Analyses of Residents' Consumption Level and Internet Communication Population

As mentioned above, the residents' consumption level of China is becoming higher and higher in recent 10 years. In fact, with the development of whole economy of China, residents' disposable income is getting more and more, which stimulates the rise of residents' consumption level. The annual date published by China's National Bureau of Statistics from 2003 to 2013 can prove this situation.

As the explanation of China's National Bureau of Statistics, we use the annual money residents spend to stand for the residents' consumption level. From the statistic data we can see, in 2003, the residents' consumption level is 4475 Yuan; while in 2013, the number turns into 15632 Yuan [1], which means the residents' consumption level is increasingly higher. Theoretically, the higher the residents' consumption level is, the more people can afford the expense of internet communication. Yet, we still hope to find out the exact correlation equation between residents' consumption level and internet communication population.

As to internet communication population, with the development of the Internet industry of China, there are more and more people enjoy the fun of surfing the internet, that is to say, the internet

communication population is arising. From the statistic data we can see, in 2003, the internet communication population is of 7950 ten thousand people; while in 2013, the number turns into 61758 ten thousand people [1].

Although the addiction to Internet brings more harm to people, from another perspective, the great internet communication population reflects the prosperity of China's economy and the rise of residents' life quality. Therefore, we can get a conclusion that the residents' consumption level will affect the internet communication population. We need to build a mathematic model to test the correlation between the residents' consumption level and the internet communication population. In all, we can see the trend of the residents' consumption level and the internet communication population by Figure 1.

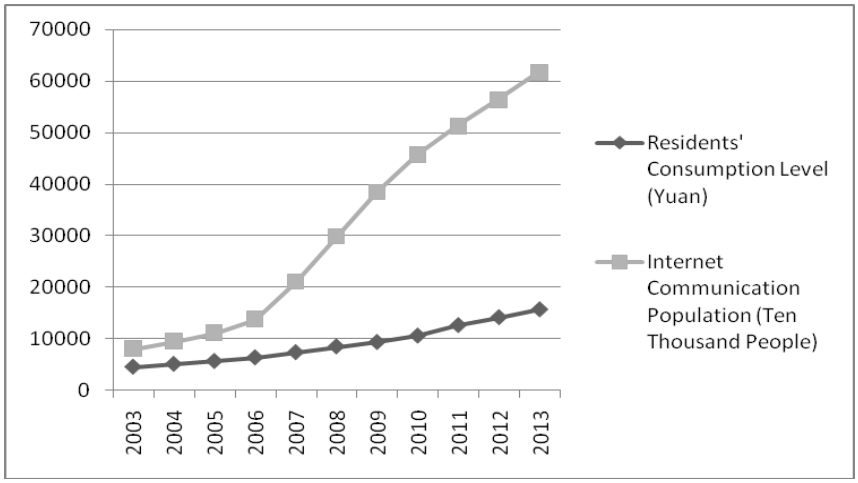

Fig. 1 Broken Line Graph of Two Variables

Empirical Analyses

Data Sample and Analysis Tool. This paper got the data sample form the website of China's National Bureau of Statistics and the data sample will be showed in Table 1[1]. Meanwhile, this paper used the econometrics software-Eviews 6.0 as analysis tool.

Table 1 Data Sample Table

Year	Residents' Consumption Level (Yuan)	Internet Communication Population (Ten Thousand People)
2003	4475	7950
2004	5032	9400
2005	5596	11100
2006	6299	13700
2007	7310	21000
2008	8430	29800
2009	9283	38400
2010	10522	45730
2011	12570	51310
2012	14110	56400
2013	15632	61758

Measures. As mentioned above, this paper will choose the data of the residents' consumption level and the internet communication population of China from 2003 to 2013, and use the econometrics software-Eviews 6.0 and the least square method to build the linear regression model

between the residents' consumption level and the internet communication population. To make it more convenient, we use X to stand for residents' consumption level and Y to stand for internet communication population. At last, the econometrics software-Eviews 6.0 will give us a result table.

First, we put all the data in Eviews 6.0 and define X as independent variable, while Y as dependent variable. And then, we can get the XY line of the two variables (see as Figure 2). From the Figure 2 we can see that with the rise of the residents' consumption level, the internet communication population is larger and larger. Thus, we can make a hypothesis that there is a correlation between the residents' consumption level and the internet communication population.

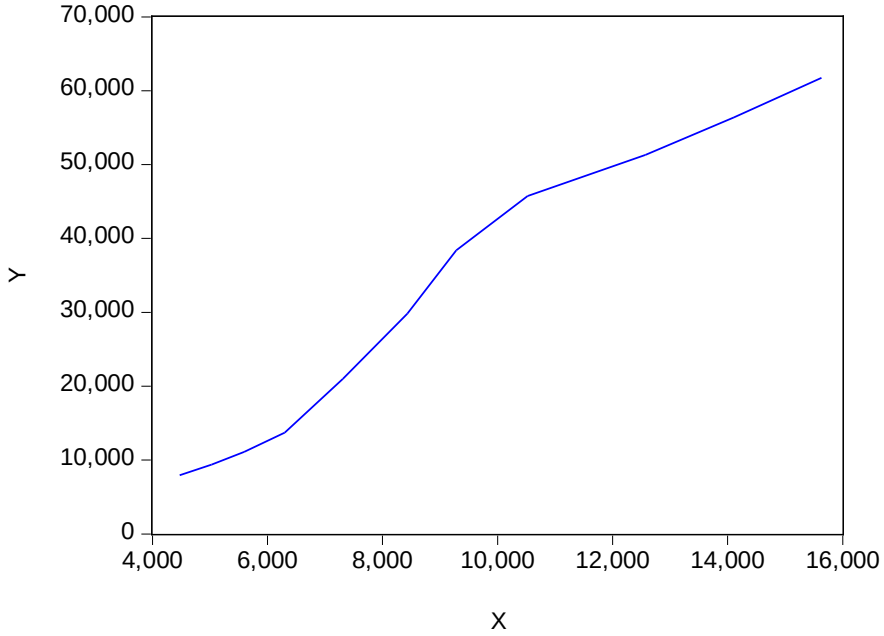

Fig. 2 XY Line Graph of Two Variables

Second, we use the least square method to test the correlation between the residents' consumption level and the internet communication population. We input "ls y c x" to the software [2], and then we can get the result table as Table 2.

Table 2 Analysis Result Table

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-15823.77	2952.713	-5.359063	0.0005
X	5.244960	0.303789	17.26517	0.0000
R-squared	0.970692	Mean dependent var		31504.36
Adjusted R-squared	0.967436	S.D. dependent var		20167.42
S.E. of regression	3639.321	Akaike info criterion		19.39995
Sum squared resid	1.19E+08	Schwarz criterion		19.47229
Log likelihood	-104.6997	F-statistic		298.0859
Durbin-Watson stat	0.651423	Prob (F-statistic)		0.000000

From the Table 2, we can get the equation between the residents' consumption level and the internet communication population as follows:

$$Y=-15823.77+5.244960X. \quad (1)$$

Besides, from the Table 2 we can get the conclusion: firstly, the R-squared is 0.970692 and the Adjusted R-squared is 0.967436, both of which are greater than 0.9, so we can know that the goodness-of-fit index of this model is reasonable.

Secondly, the Probability of t-Statistic of C and X are almost 0, which means that the two variable are very significant. Last but not the least, the Probability of F-statistic is 0, which shows that the whole model is very significant.

All these results tell us that our hypothesis is true-there does exist correlation between the residents' consumption level and the internet communication population, and when the residents' consumption level increases 1 Yuan, the internet communication population will increase about 52449 people, which means, once the residents' consumption level is getting higher, the internet communication population will get larger.

Conclusions

The empirical analysis result shows that there exists a linear correlation between the residents' consumption level and the internet communication population and the residents' consumption level will affect the internet communication population positively. We must admit that nowadays in China, there are more and more people starting to enjoy the fun of surfing the Internet, which stands for the computer application is making a great progress in China. Thus, Chinese should make more effort to raise their consumption level and improve the computer and Internet application in China.

References

[1] Information on http://www.stats.gov.cn/

[2] Zinai Li, Econometrics, Higher Education Press, Beijing, 2000.