An Empirical Analysis of the Development Level of Electric Business in the Age of Big Data in Fujian

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ABSTRACT

The development of electronic commerce is increasingly becoming an important engine for stimulating consumption demand and promoting the upgrading of traditional industries. This paper establishes the regression model based on the national economy of Fujian Province, and puts forward strategies and suggestions to deepen the development of electronic commerce in Fujian province based on the regression model.

INTRODUCTION

With the deepening of the Internet 3.0, e-commerce is becoming the main force of Chinese emerging industries. E-commerce’s impact on the economy is bigger than ever, which promotes the rapid and steady growth of Chinese GDP. Over the past five years, there was a rapid development of e-commerce in China, and the volume of transactions has increased rapidly year by year. Chinese e-commerce is rapidly maturing. E-commerce has in-depth development in various fields, and has a profound impact on people's way of life, expanding domestic demand and change the mode of economic development.

DEVELOPMENT STATUS OF ELECTRONIC COMMERCE IN FUJIAN PROVINCE

As an important part of modern business, Chinese e-commerce is developing at an unprecedented speed. E-commerce in Fujian is to adapt to and develop according to the national strategy and the process of growth in the Haixi demand. In 2001, during the “fifteen” and “11th Five-Year”, Fujian established an E-commerce Guidance and Coordination Group. In 2002, Fujian established E-commerce Association and the CA Center. In 2005, Fujian established the E-commerce Expert Group. Through continuous exploration and adjustment for ten years, e-commerce in Fujian province is quickly entering the maturing period of e-commerce.

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Numbers of internet users, registered domain name, numbers of websites, the rapid growth in popularity rate of the Internet

The above is the basis of the development of e-commerce. As of June 2014, the number of Internet users that is more than 10 million in Chinese 31 provinces, municipalities that are directly under the central government and autonomous regions, there are 25, and there are 12 provinces that their Internet penetration rate exceeded the national average level. There are 668 million Chinese Internet users, and the Internet penetration rate is 48.8%, and the area total of 18 million, 940 thousand new users in six months. Among them, the number of Internet users has reached 24 million, 710 thousand in Fujian Province, accounting for 65.5% of the population of the province, and the popularity rate ranked fourth in the country; there are 902089 registration of existing domain name (accounting for 4.4%), and there are 398560 CN domain (accounting for 3.6%); the number of websites is 223442 (not including the educational website, accounting for 6.70%) \[5,8,10,11\].

Under the support from policies, small and medium sized enterprises in the application of e-commerce has a rapid development

For large enterprises, construction and maintenance of the company's website generally needs large human and material resources. For small and medium sized enterprises, there is a certain financial difficulty, many small and medium sized enterprises have to give up the convenient online channels. Mobile communication may be more practical and feasible. Small and medium sized enterprises accounted for more than 99% of the total amount of enterprises in Fujian, yet only 10% of the them have the ability to independently build the way to carry out a full range of e-commerce operations. In 2014, the province has developed "Fujian electronic commerce talent training program", and launched the business incubation project, which popularized knowledge of e-commerce to 100 thousand people, and trained 180 thousand e-commerce professionals\[5,10\].

Rapid development of mobile e-commerce

Mobile e-commerce is an important part of and a focused development of the modern electronic commerce. At the end of November 2012, mobile phone users reached 40 million 310 thousand in Fujian; the province's mobile phone users penetration rate has reached 108.4%, the penetration rate ranks sixth in the country. Internet users reached 39 million, and optical fiber covers 8 million households; city users have more than 50M access capability, where township areas have more than 20M access capability and rural areas have more than 12M access capability\[10\].

In Fujian Province, the third party payment software of the internet shows an explosive growth rate. As of August 2015, the two mobile operators: Fujian
Telecom and Fujian Mobile distributed in the whole province, using NFC (Near Field Communication), to apply to the convenience store, supermarket shopping, vending machine consumption, bus card and so forth. Fujian Unicom cooperated with Xiamen Zhiye to provide medical information solutions, focusing on the medical and health applications. Mobile medical care system; portal and emergency mobile infusion management system; mobile collaborative office system. [7]

EMPIRICAL ANALYSIS OF THE DEVELOPMENT LEVEL OF E-COMMERCE IN FUJIAN

This paper selects Fujian Province as the research object, select the national economy per capita of Fujian Province as the dependent variable, as well as the e-commerce development index data in Fujian Province during the period of 2010-2014 as independent variables, using Eviews 6.0 software tools to build the multiple regression model based on economic indicators in electronic commerce in Fujian province and the national economy per capita. According to the regression model, and combined with the present situation of Fujian, this paper puts forward strategies and suggestions of the optimization of e-commerce development.

Variables Selection and Data Collection

REAL GROSS DOMESTIC PRODUCT PER CAPITA (RGDP) OF FUJIAN PROVINCE

The Real GDP per capita of Fujian province is a standard to measure the living standard of Fujian province. Figure 1 shows the history of Real GDP per capita in 2000-2014 in Fujian province.

![Figure 1. Real GDP per capita in 2000-2014 in Fujian (yuan).](image)
THE NUMBER OF INTERNET USERS IN FUJIAN PROVINCE (X1)

![Graph of Internet users in Fujian Province from 2000 to 2014.](image)

Data source: Statistical Yearbook of Fujian Province.

Figure 2. The number of Internet users in 2000-2014 in Fujian (million).

According to the China Internet Network Information Center\[8\] (CNNIC) released yearly, the data of “the statistical report of Chinese Internet development” shows that the number of network users increased year by year. We set the number of users to X1. Figure 2 shows the history of the number of Internet users in Fujian Province, 2000-2014.

TOTAL E-COMMERCE TRANSACTIONS IN FUJIAN (X2)

In 2008, transactions of B2B, B2C, C2C are respectively accounted for 89.50%, 7.40%, 3.10% of the total e-commerce transactions in China, B2B is still the main body of the e-commerce market. Through the discussion of the influencing factors of the overall electronic commerce development level in Fujian Province, this paper selects total e-commerce transactions in Fujian province as a factor, considering the data availability. This paper selects the total amount of the transaction of the B2B. We set the electronic commerce transaction volume in Fujian province is X2, figure 3 shows the history e-commerce transactions’ changing trend in Fujian Province, from 2000 to 2014 \[^{[9,10,11]}\].

![Graph of e-commerce transactions in Fujian Province from 2000 to 2014.](image)

Figure 3. E-commerce transactions in 2000-2014 in Fujian province (100 million).
Determination and verification of the regression model

Therefore, there are two independent variables. According to the positive correlation discussed above, we set the regression function of household disposable income per capita as:

\[ RGD\text{P}_t = C + a_t X_1 + b_t X_2 + \varepsilon \]  

(1)

Among them, C is the constant, A and B are respectively X1 and X2 for the regression coefficients of e-commerce’s development, \( \varepsilon \) is the random variables.

DETERMINATION OF THE REGRESSION MODEL

Based on the collected data, and the model is established by software EViews6.0. The results are shown in Figure 4.

![Figure 4. Results of the regression analysis.](image)

The Durbin-Watson method is to test the first order autocorrelation, also known as the DW test. If the DW value is far from 2.0, then there is a correlation between them. And if the value is close to 2, then it indicates that there is no self correlation. From figure 4 above, we can see that the DW value is 0.895597, which is far from 2, indicating that there is a self correlation. First, through the data processing of logarithmic, we can see if it can eliminate the correlation between them, the test results are shown in Figure 5 below. The test results from figure 5 can be clearly seen, although the DW value has become larger, that is 1.017103, but the deviation from 2.0 is still relatively far, so the data logarithmic does not eliminate the correlation between them.
Because of the unsuccessful elimination of the correlation of them by logarithmic, we will take the generalized difference to eliminate the self-correlation between them. Based on different variable difference or differential combination of different variables, we found that if we conduct a first-order differential on the independent X2, we can eliminate the self-correlation. The test results are shown in Figure 6.

On the other hand, we can also determine whether there is any correlation between them by conducting other tests. First of all, we draw its residual diagram for the results of the model built in Figure 6, that is, the residual analysis, and the results of the analysis are shown in figure 7. The results from the residual analysis, it shows the existence of the periodic fluctuation of the residual series (there may be an autocorrelation). Then we conduct the partial autocorrelation analysis. The results of the analysis are shown in figure 8. By the partial autocorrelation
coefficient PAC, the histogram of each period is not more than the dotted line in
the graph, indicating that there is no correlation between them.

Figure 7. Residual diagram.

Based on the analysis from above, through the established function model
from all aspects are basically passing the corresponding inspection, so the sample
of the regression model of the electronic commerce development level in Fujian
province can be established as:

\[
\text{RGDP} = 9610.558 + 11.61095X_1 - 17.42203X_2 + 27.34834X_2(-1)
\]

(2)

The regression model shows: when the total e-commerce transactions in
Fujian province is unchanged, each 1% increase of Fujian province’s number of
the Internet user, the GDP per capita in Fujian province will increase 11.61%; on
the other hand, when the number stays the same, every 1% increase in the total
amount of e-commerce transactions, the GDP will increase 28%.

CONCLUSIONS

Through the empirical analysis above, we establish the regression model of
e-commerce development level in Fujian Province:
\[ RGDP = 9610.558 + 11.61095X1 - 17.42203X2 + 27.34834X2(-1) \]  

(3)

At the same time, from the model we found that when the total e-commerce transactions in Fujian province is unchanged, each 1% increase of Fujian province’s Internet user, the GDP per capita in Fujian province will increase 11.61%; on the other hand, when the number of Fujian province Internet is unchanged, each 1% increase in the total e-commerce transactions one year ago, the GDP per capita in Fujian province will increase 28%. From the empirical analysis above, it shows the GDP can be increased by the increase of the Internet users and the total amount of e-commerce transactions, and to improve the amount of the two factors by following the strategies to promote the growth of GDP, thus promoting the development of electronic commerce.

REFERENCES