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The Impact of e-Commerce on China's Economic Growth

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Abstract: Based on the theory of economic growth and e-Commerce, this paper analyze and expounds the meaning, characteristics and classification of e-Commerce, the factors affecting e-Commerce development and impact mechanism of e-Commerce development to the national economy growth. It uses economic growth from the present situation of Chinese e-Commerce development. At last, the paper proposes appropriate e-Commerce development approaches based on the results of analysis of the problems of Chinese e-Commerce development.

Keywords: electronic Commerce(e-Commerce), economic development, regression analysis

1. INTRODUCTION

With the Internet as an open network environment, e-Commerce refers to a variety of business activities in the wide range of worldwide commercial trade[1], based on browser/server application mode . In e-Commerce, buyers and sellers do not meet each other but realize the consumers shopping online, merchants online, payment online and a variety of business activities[2], trading activities , financial activities and activities related to integrated   a new e-Commerce business services model, which use the information technology and network communication technology for commercial activities[3] .

With the rapid development of science and technology in today's society, the country's development is inseparable with the development of IT industry[4], and e-Commerce industry is the emerging industry in the IT industry[5]. Given e-Commerce industry own the growing proportion in the national economy, the association between e-Commerce industry and economic growth becomes increasingly important.

To clearly analyze the degree of e-Commerce's impact on economy will be used to find out the advantages and problems in e-Commerce development, adjust the e-Commerce industry structure, make greater and more positive contribution to the national economy development[6-8].

2. ANALYSIS THE ROLE OF E-COMMERCE TO PROMOTE ECONOMIC GROWTH

The reason why e-Commerce can become a major cause of economic growth is combined by a variety of factors[9-11]. These factors are mainly as followed: (1)e-Commerce is closely related to modern advances in information technology, (2)Secondly, based on the information and Internet constructions, (3)Third, as the innovation of traditional business activities, (4)has formed an ecosystem chain, (5)with strong permeability. These factors indicate that e-Commerce has become important motivating factors for economic growth.

2.1 Consumption on the Economic

e-Commerce can provide people with a wider range of product choices and can greatly satisfy the people's material and cultural needs, therefore it has attracted more and more consumers to conduct online transactions, increasing the people's consumption expenditures. The rapid development of e-Commerce provide a basis for the development of computer industry, Internet technology industry and logistics industry, provide more employment and related practitioners.

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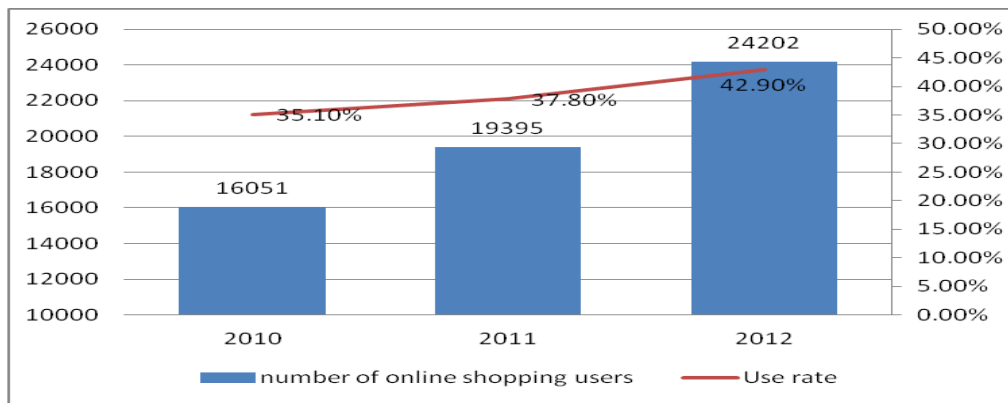
Figure 1.   The number and use rate of online shopping users in mainland China   2010-2012 (unit:10,000)

e-Commerce is efficient, convenient, non space-time restrictive, which can greatly attract businesses and consumers' online transactions. In summary, the development of e-Commerce will stimulate related electronic products consumption and promote computer and Internet industry's rapid development.
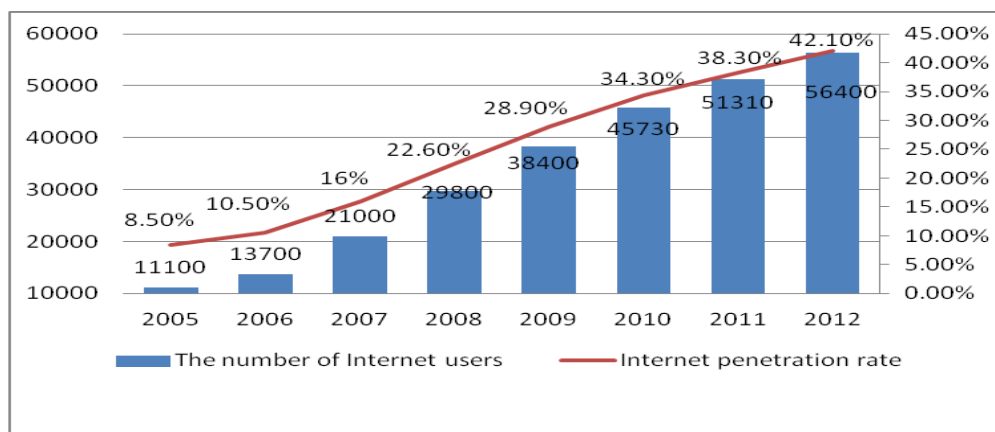

Figure 2.   The scale of China's Internet users and Internet penetration rate 2005-2012   (unit:10,000)

2.2   Investment in the Economy

e-Commerce as an emerging industry, is gradually becoming a controversial industry, but also gradually being accepted. Only when the related business have own a certain size in the warehouse, inventory, logistics and other aspects can develop e-Commerce. Many companies will invest in these areas to make their businesses to win in the competition. e-Commerce is also a great role in promoting online advertising, which is the main source of income for portal website, which will stimulate the relevant enterprises and businesses to increase investment in online advertising. e-Commerce is the expanded sources of funding to support the system, and help more companies survive the economic crisis period, so we should have great confidence on the development prospects of e-Commerce market.
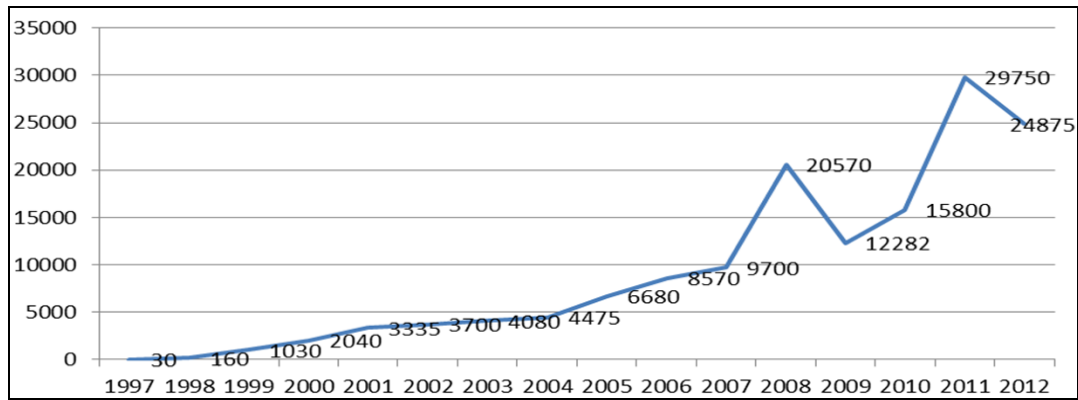
Figure 3.   The number of electronic commerce services enterprises 1997-2012 (unit:10,000)

2.3   The Role of Government Purchases on the Economy

The Government plays a decisive role in national economy. Therefore, with the development of e-Commerce industry, the government also increase the purchasing needs, causing the market demand and promote economic development. Meanwhile, with the security requirements of e-Commerce, the government should increase the security-related procurement spending, thereby to ensure confidence in e-Commerce by businesses and consumers, to ensure proper functioning.

2.4   The role of exports to economic

The emergence of e-Commerce has led to a profound transformation in the field of international trade. Its wide application give the great contribution in restructuring of the world market, the new generation of production and management, as well as the international division, growth of trade within multinational companies. With the development of tertiary industry, IT technology advances, more and more obvious advantages of e-Commerce can be realized. In the near future, e-Commerce is bound to become the mainstream of international import and export trade mode.
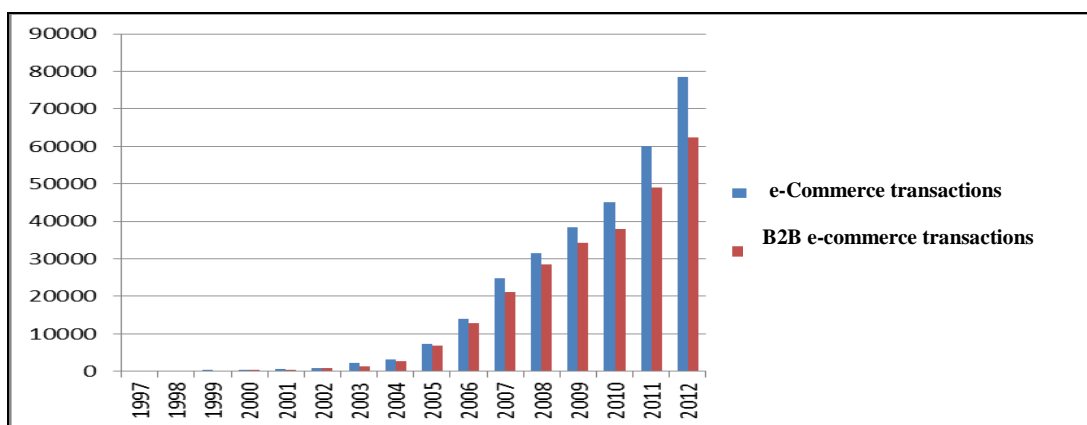

Figure 4.   The rapid growth of e-commerce transactions

3.   DATA AND VARIABLES FOR CASE ANALYSIS

3.1   Selection Model and Data Sources

In order to verify the e-Commerce's impact on China's economic growth, we collect data set as in table 1.

<p align="center">Table 1.   The GDP and E-Commerce Data</p>

Year	GDP (hundred million	Domain Number(Ten thousand)	Number of Internet users(Ten thousand)	Number of e-Commerce businesses(Ten thousand)	Number of online shopping user(Ten thousand)	e-Commerce transactions(hundred million)
1997	78973	0.5	62	30	10	100
1998	84402	2	210	160	20	200
1999	89677	5	890	1030	50	300
2000	99214	12	2250	2040	400	400
2001	109655	13	3370	3335	1400	600
2002	120332	18	5910	3700	2400	900
2003	135822	34	7950	4080	3600	2300
2004	159878	185	9400	4475	4000	3200
2005	184937	259	11100	6680	4500	7300
2006	216314	411	13700	8570	5000	14000
2007	265810	1193	21000	9700	5600	21400
2008	314045	1682	29800	10570	7950	31400
2009	340902	1683	38400	12282	10800	35400
2010	401512	866	45700	15800	16100	45000
2011	472881	775	51300	20750	19400	60000
2012	519322	1341	56400	24875	24200	78500

The data in table 1 come from "1997- 2012China Statistical Yearbook", the China Internet Network Information Center released the "China Internet Development Analysis Report", China B2B Research Center released the "1997-2009 China's e-Commerce survey twelve years", "2010 China e-Commerce market data monitoring report", "2011 China e-Commerce market data monitoring report", "2012 China Electronics Commerce market data monitoring report "and other data provided as the sample, shown in the table 1. The GDP in 2000 is as the base year, to eliminate price factors.

3.2   Correlation analysis

3.2.1 Multiple Linear Regression Model

China's GDP value is the dependent variable. Five factors that can measure the level of development of e-Commerce are used as the independent variables, including domain name number, number of Internet users, number of e-Commerce businesses, number of online shopping user, number of e-Commerce transactions. The Multiple Linear Regression Model is established as followed:

$$GDP=a_0+a_1x_1+a_2x_2+a_3x_3+a_4x_4+a_5x_5+\mu \qquad (1)$$

GDP: Gross Domestic Product, a_0:Constant,a_1~a_5:Parameters,μ:Random variable, x_1: domain name number, x_2: number of Internet users, x_3: number of e-Commerce businesses, x_4: number of online shopping user, x_5: number of e-Commerce transactions.

3.2.2 Factors Correlation Analysis

The correlation analysis results of the five independent variables is shown in Table 2.

Table 2.   Correlation coefficient matrix between GDP and five e-commerce development factors

		GDP	x_1	x_2	x_3	x_4	x_5
GDP	Pearson Correlation	1	.800**	.994**	.990**	.978**	.984**
	Significance (one-sided)		.000	.000	.000	.000	.000
	N	16	16	16	16	16	16
x_1	Pearson Correlation	.800**	1	.799**	.737**	.683**	.759**
	Significance (one-sided)	.000		.000	.001	.002	.000
	N	16	16	16	16	16	16
x_2	Pearson Correlation	.994**	.799**	1	.977**	.977**	.979**
	Significance (one-sided)	.000	.000		.000	.000	.000
	N	16	16	16	16	16	16
x_3	Pearson Correlation	.990**	.737**	.977**	1	.986**	.982**
	Significance (one-sided)	.000	.001	.000		.000	.000
	N	16	16	16	16	16	16
x_4	Pearson Correlation	.978**	.683**	.977**	.986**	1	.983**
	Significance (one-sided)	.000	.002	.000	.000		.000
	N	16	16	16	16	16	16
x_5	Pearson Correlation	.984**	.759**	.979**	.982**	.983**	1
	Significance (one-sided)	.000	.000	.000	.000	.000	
	N	16	16	16	16	16	16
**. Significant correlation							

Table 2 shows that Gross the correlation coefficient between Domestic Product and the number of domain names, the number of Internet users, the number of e-Commerce enterprises, the number of online shopping users and number of e-Commerce transaction is 0.800, 0.994 and 0.990, 0.978, 0.984 respectively. Their correlation coefficient test probability p are approximately 0. Therefore, when the significance level α is 0.95, correlation coefficient test should reject the null hypothesis. This indicates the number of domain names, the number of Internet users, the number of e-Commerce enterprises, the number of online shopping users and e-Commerce transactions and Gross Domestic Product exists positive relationship, that also explain the e-Commerce has the positive effect on the economic growth.

With these five variables, this paper used the multiple linear regression analysis to further study the impact of electronic commerce on the national level.

4.   Multiple Linear Regression Analysis

Backward screening method is used for multiple linear regression analysis to determine these five factors' significant impact on GDP.

Table 3.   Multiple linear regression analysis for GDP and e-Commerce development factors

Model		Parameter a		t	Sig.
		B	error		
Model 1	(Constant)	75382.685	4832.422	15.599	.000
	x_1	3.933	11.088	.355	.730
	x_2	4.521	1.005	4.498	.001
	x_3	10.689	2.086	5.124	.000
	x_4	-4.902	3.723	-1.317	.217
	x_5	.522	.660	.792	.447
Model 2	(Constant)	75452.003	4632.640	16.287	.000
	x_2	4.804	.585	8.207	.000
	x_3	10.922	1.900	5.749	.000
	x_4	-6.007	1.954	-3.075	.011
	x_5	.638	.551	1.158	.271
Model 3	(Constant)	72327.375	3819.006	18.939	.000
	x_2	5.062	.549	9.219	.000
	x_3	11.540	1.849	6.241	.000
	x_4	-5.190	1.848	-2.809	.016

From Table 3, three models with different independent variables can be calculated.

a) Model 1

$$GDP=75382.685+3.933x_1+4.521x_2+10.689x_3-4.902x_4+0.522x_5 \tag{2}$$

b) Model 2

$$GDP=75452.003+4.804x_2+10.922x_3-6.007x_4+0.638x_5 \tag{3}$$

c) Model 3

$$GDP=72327.375+5.062x2+11.540x3-5.190x4 \tag{4}$$

Table 3 shows the significance test detailed results in regression coefficients of each variable.

At significance level $\alpha=0.95$, in the model 1, number of the domain name variable's regression coefficient is not significant (p value is greater than the significance level α), so this variable is kicked out and then get the model 2.

In model 2, the e-Commerce transactions variable's regression coefficient is not significant (p value is greater than the significance level α), so this variable is kicked out and then get the final model 3.

So model 3 is the final result of this problem. This regression equation implies that when the number of Internet users, e-Commerce business and online shopping users   get 1 unit increment, will induce GDP increase 5.062 units, 11.540 units and 5.190 units, respectively.

5.   CONCLUSIONS

From the regression analysis process and its results, the five important e-Commerce factors have the significant positive correlation with Gross Domestic Product, especially the number of Internet users, the number of e-Commerce enterprises, the increasing number of online shopping users. This paper indicates that e-Commerce development play influence to economic growth.

In order to make e-Commerce development play a greater role in economic growth, national governments, businesses and consumers need to put more emphasis on e-Commerce, increase investment in infrastructure, train e-Commerce professionals, make more users online shopping,   to improve the level of e-Commerce and promote economic growth.

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