International Journal of Latest Research in Engineering and Technology (IJLRET)
ISSN: 2454-5031
www.ijlret.com || Volume 04 - Issue 07 || July 2018 || PP. 77-83

The impact of Internet development on the level of urbanization

Xin-ru Wang[1], Ping Xiao[2*]
[1](*School of Hunan University of Humanities, Science and Technology, Hunan417000, China)*
[2] (*School of Hunan University of Humanities, Science and Technology, Hunan 417000, China*)
**Corresponding author. applefly13@126.com*

ABSTRACT: This paper analyzes the existing relationship between the two based on the Internet and urbanization, which are closely related to social development. Firstly, collect indicators that affect the level of Internet development and urbanization. Secondly, use the pearson correlation coefficient to test the correlation coefficient between the variables affecting the level of urbanization, and judge that there is a high correlation between other variables except the registered unemployment rate. Then, using SPSS to perform dimension reduction and factor analysis on the selected variables, the model is established to obtain the level of urbanization. By comparing with the urbanization rate after standardization, it is found that the data of the model is basically consistent with it. Finally, a multivariate linear regression model was established to study the relationship between the factors affecting the development of the Internet and the level of urbanization.
Keywords: Internet development ; urbanization level ; multiple linear regression; factor analysis

I. Introduction

With the support of economic globalization, the Internet is deeply related to people's lives and is closely related to people's lives. Since the introduction of China's Internet in 1994, the penetration rate of the Internet has reached 54.3% in 2017, an increase of 38.3% compared to 2007 and 4.6% of the world's level. So far, the number of Internet users in China has reached 751 million. In June 2017, the proportion of China's urban net cities was 73.3%, an increase of 17 million 880 thousand compared with 2016. Since the reform and opening up, the level of urbanization in China is also improving. In 1978, China's urbanization rate was 17.9%, 44.9% in 2007 and 58.5% in 2017, reaching 13.620% growth over the past 10 years. The increase is 40.6%.

The study of the urbanization and urbanization. The direction and development of urbanization are very important. There is a lot of problems in rural areas. Construction. The difference between urban and rural areas in China is very poor. The difference between the economic development level and the development level of the Ministry of the urban and rural sectors is reflected. The development of the rural economy and the rural economic reform. The construction and the construction of the industrial economy.

Domestic and foreign scholars have studied different factors from the perspective of the development of the Internet on the level of urbanization. However, the conclusions of research in different countries and regions around the world are not the same.

Overseas, Kiiski etal. examined data from 1995 to 2000 in about 60 countries. The study shows that the growth rate of Internet users per thousand in five years is related to per capita income, telephone access costs, and average years of schooling. Beilock et al. studied the causes of differences in Internet penetration rates in 105 countries. The results indicate that per capita income, social openness, and telecommunications infrastructure are important factors in the difference in Internet penetration between countries. Oyeyinka et al. used cross-sectional data to analyze Internet diffusion problems in 38 countries in sub-Saharan Africa. The results show that telecommunication infrastructure plays an important role in Internet proliferation [3]. Chinn et al. conducted a comparative study of the differences between PC and Internet development in 161 countries in 1999-2001, examining the impact of economic variables, demographic variables, infrastructure, telecommunications prices, and regulatory policies on computer and Internet adoption.

In China, Ge Weiming studied the impact of Internet development on the global economy in the study of network effects [1]; Liu Guifang used the domain name ownership of various provinces in China as an entry point to analyze the regional differences in China's Internet [2]; Yu Liping proposed to use The index system for measuring the development level of China's Internet [3]; Xu Chongjun analyzed the connotation of China's urbanization process from the perspective of political economy, and constructed a productivity level indicator system. The research shows that "the level of productivity is the cause of urbanization." One-way causality, under the influence of urbanization, proposes a proposal to promote new urbanization steadily [6]; Deng Shan uses r language to initially study the relationship between Internet development and urbanization [8]; He studied the impact of the Internet economy on the national economy and its development trends.

Summarizing the research of these scholars, we can get the following conclusions: 1. In recent years, China's Internet has developed rapidly and has a significant impact on China's economy. 2. In recent years, the

regional gap in China's Internet development has been shrinking, and its degree of differentiation has gradually improved with China's economic development level. The degree of difference is close; 3. The level of urbanization in China is also increasing year by year, and the development of the Internet has driven the development of urbanization.

The research object of this paper is the development of the Internet and the level of urbanization. This paper establishes the regression model of urbanization level as an indicator to evaluate the level of urbanization, and analyzes the impact of the development degree of the Internet. By summarizing and summarizing the existing researches on the development of the Internet, we can clarify the definition of the degree of Internet development and its characteristics, and then establish reasonable rationality based on the relevant theoretical basis and analytical principles. The Internet index flat angle system, then use the dimensionality reduction method to deal with the relevant indicators of Internet development, and then carry out regression analysis and test to obtain the comprehensive score and urbanization rate to verify the role of urbanization level in the development of the Internet, and finally analyze Factors that may affect the level of urbanization and propose appropriate policy recommendations based on the results of the study.

This paper focuses on the theoretical analysis to determine whether the level of urbanization will have an impact on the development of the Internet and quantitatively analyze it through dimensionality reduction and regression analysis. The difficulty lies mainly in the empirical analysis and how to determine the concept of urbanization level in this paper. The analysis of the urbanization level indicators and Internet development indicators and the collection and processing of data:

It is necessary to strengthen the promotion of urbanization and attach importance to the development of the Internet. Therefore, the research on the level of urbanization and the level of Internet development is relatively rich, but it is mainly concentrated on theoretical analysis. There are few related studies on the empirical analysis of the relationship between them. In view of this, based on the appropriate reference to the existing relevant literature, this paper establishes an urbanization level model from the combination of theory and practice to explore the development of China's urbanization level in recent years, and proposes countermeasures based on this Suggest.

Comprehensively using regression analysis, a set of evaluations suitable for China's urbanization level has been established, and it has a practical operability index system. Finally, we will analyze the impact of urbanization and urbanization. Because of the analysis and the influence of the most influential factors, we need to make specific use of them.

II. Data source and processing

2.1. Variable selection

Based on the collation of relevant literature and the actual situation of the development level of the Internet, the factors affecting the development level of the Internet are divided into four categories: economic level, network resources, infrastructure and Internet access equipment. The seven indicators of per capita GDP, netizen size, number of websites, number of IPV4 addresses, number of CN domain names, mobile phone penetration rate, and Internet penetration rate were pre-screened.

Table 1

internet development

index	economic level	network resources			infrastructure		internet access equipment
year	per capita GDP	the scale of Chinese netizens (tens of thousands)	internet penetration rate (%)	number of websites(tens of thousands)	number of ipv4 addresses (tens of thousands)	CN domain names (tens of thousands)	mobile phone penetration rate (%)
2007	20505	21000	16.0	150	13527	900	24.0
2008	24121	29800	22.6	287	18127	1357	39.5
2009	26222	38400	28.9	323	23245	1345	60.8
2010	30876	45700	34.3	191	27764	434	66.2
2011	36403	51300	38.3	230	33044	353	69.3
2012	40007	56400	42.1	268	33053	751	74.5
2013	43852	61700	45.8	320	33031	1082	81.0
2014	47203	64800	47.9	335	33199	1108	85.8
2015	50251	68800	50.3	423	33652	1636	90.1
2016	53935	73100	53.2	482	33810	2061	95.1
2017	57986	75100	54.3	506	33870	2085	97.5

The factors affecting the urbanization process are divided into five categories: economy, population, resources and environment, society and living indicators. Screening 11 industrialization rates, secondary industry share, tertiary industry share, urban population share, domestic waste treatment rate, afforestation area, registered unemployment rate, number of medical beds, per capita GDP, disposable income of urban residents,

and urban residents' consumption expenditure variable. According to the analysis, this indicator is used to replace the level of urbanization.

Table 2

Degree of Urbanizationcon											
index	economic indicators			demographic indicator	resources and environment indicators		social indicators		life indicators		
years	industrialization rate (%)	the propotion of the second	the propotion of the third	urban population proportion	treatment rate of domestic	afforestation area (1000HA)	registered unemployment rate(%)	medical treatment(number of bed:ten	agdp (RMB)	urban per capita disposable	consumption expenditure of urban residents
2007	41.3	46.9	42.9	45.9	62.0	3907.7	4.0	370.1	20505	13786	9998
2008	41.2	46.9	42.8	47.0	66.8	5354.4	4.2	403.9	24121	15781	11242
2009	39.6	45.9	44.3	48.3	71.4	6262.3	4.3	441.7	26222	17175	12264
2010	40.0	46.4	44.1	49.9	77.9	5909.9	4.1	478.7	30876	19109	13471
2011	39.9	46.4	44.2	51.3	79.7	5996.6	4.1	516.0	36403	21810	15160
2012	38.7	45.3	45.3	52.6	84.8	5595.8	4.1	572.5	40007	24565	16674
2013	37.4	44.0	46.7	53.7	89.3	6100.1	4.1	618.2	43852	26467	18488
2014	36.3	43.1	47.8	54.8	91.8	5549.6	4.1	660.1	47203	28844	19968
2015	34.3	40.9	50.2	56.1	94.1	7683.7	4.1	701.5	50251	31195	21392
2016	35.2	39.8	51.6	57.3	96.6	7203.5	4.0	741.1	53935	33616	23079
2007	36.2	40.5	52.1	58.2	97.2	7418.6	4.0	740.5	53769	33718	23148

2.2. Data source and processing

Industrialization rate, secondary industry share, tertiary industry share, urban population share, domestic waste treatment rate, registered unemployment rate, number of medical beds, per capita GDP, disposable income of urban residents and urban residents' consumption expenditures all came from 2007-- -- The 2017 China Statistical Yearbook, in which per capita GDP is based on 2007 and is calculated using the per capita GDP index. The size of the network name, the number of websites, the number of domain names, the number of IPV4 addresses, and the penetration rate of mobile phones are all derived from the "China Internet Information Center", in which the mobile phone penetration rate is calculated by weighted average of the proportion of urban and the countryside population. Due to the inconsistency of each indicator unit, the dimension reduction process was performed using SPSS19.0 before modeling.

III. Empirical analysis and results

3.1. Research methods

In scientific research in various fields, it is often necessary to perform a large number of observations on multiple variables that reflect things, and collect large amounts of data for analysis to find patterns. Multivariate samples will undoubtedly provide a wealth of information for scientific research. However, the workload of the collection is also increased to a certain extent, and more importantly, in more cases, the complexity of the analysis problem is increased due to the correlation between many variables. In order to study the relationship between the development level of the Internet and the level of urbanization, factor analysis in SPSS is used to reflect the correlation.

3.2. Research steps

Research on urbanization level

Using the 11 indicators that affect the level of urbanization, the pearson correlation coefficient test shows that in addition to the registered unemployment rate, the correlation coefficient between the other variables is as high as 70%, which is suitable for factor analysis.

Table3

Relevance [a]

		Industrialization rate (%)	The proportion of the secondary industry (%)	The proportion of the tertiary industry (%)	Urban population share (%)	Domestic garbage disposal rate (%)	Afforestation area (thousand hectares)	egistered unemPloymentrate (%)	edical (bed number 10,000)	DP per capita (RMB)	er capita disposable in comeo furban residents(yuan)	rban residents' consumption expenditure (yuan)
Industrialization rate (%)	Pearson correlation	1	.949	-.933	-.932	-.932	-.794	349	.955	.939	.947	.950

	Significant(one side)		.000	.000	.000	.000	.002	146	000	000	000	000
The proportion of thesecondary industry (%)	Pearson correlation	.949	1	-.992	-.927	-.892	-.800	474	.945	.921	.946	.950
	Significant(one side)	.000		.000	.000	.000	.002	070	000	000	000	000
The proportion of the tertiary industry (%)	Pearson correlation	-.933	-.992	1	.949	.910	.814	.497	956	936	958	962
	Significant(one side)	.000	.000		.000	.000	.001	060	000	000	000	000
Urban population share (%)	Pearson correlation	-.932	-.927	.949	1	.991	.801	.475	996	996	996	996
	Significant(one side)	.000	.000	.000		.000	.002	070	000	000	000	000
Domestic garbage disposal rate (%)	Pearson correlation	-.932	-.892	.910	.991	1	.785	.421	988	992	985	984
	Significant(one side)	.000	.000	.000	.000		.002	099	000	000	000	000
Afforestation area (thousand hectares)	Pearson correlation	-.794	-.800	.814	.801	.785	1	.068	788	774	787	788
	Significant(one side)	.002	.002	.001	.002	.002		421	002	003	002	002
Registered unemployment rate (%)	Pearson correlation	.349	.474	-.497	-.475	-.421	-.068		.469	.478	.483	.482
	Significant(one side)	.146	.070	.060	.070	.099	.421		073	068	066	067
Medical (bed number 10,000)	Pearson correlation	-.955	-.945	.956	.996	.988	.788	.469		997	999	999
	Significant(one side)	.000	.000	.000	.000	.000	.002	073		000	000	000
GDPper capita (RMB)	Pearson correlation	-.939	-.921	.936	.996	.992	.774	.478	997		997	996
	Significant(one side)	.000	.000	.000	.000	.000	.003	068	000		000	000
Per capita disposable income of urban residents (yuan)	Pearson correlation	-.947	-.946	.958	.996	.985	.787	.483	999	997		.000
	Significant(one side)	.000	.000	.000	.000	.000	.002	066	000	000		000

Urban residents' consumption expenditure (yuan)	Pearson correlation	-.950	-.950	.962	.996	.984	.788	.482	999	996	.000
	Significant(one side)	.000	.000	.000	.000	.000	.002	067	000	000	000

a. List N=11

After eliminating the registered unemployment rate, the factor analysis of the 10 variables affecting the urbanization level is carried out. According to the principle that the eigenvalue is greater than 1, a factor is selected, the eigen value is 9.385, and the variance contribution rate is 83.846%, indicating that there is a high degree between the variables relationship.

Table 4

Total variance of interpretation

Ingredients	Initial eigenvalue			Extract square sum loading		
	Total	% of variance	accumulation%	total	% of variance	accumulation%
1	9.385	93.846	93.846	9.385	93.846	93.846
2	.344	3.442	97.288			
3	.183	1.833	99.121			
4	.078	.776	99.897			
5	.007	.068	99.965			
6	.003	.027	99.992			
7	.000	.004	99.996			
8	.000	.003	100.000			
9	1.861E-005	.000	100.000			
10	6.994E-007	6.994E-006	100.000			

Extraction method: principal component analysis.

The weighted sum of the factors (b1) is weighted by the eigenvalues - an approximation of the urbanization level (city).

$$CI=9.385*b1+c$$

At the same time, in the "China Statistics Bureau Yearbook", we found the urbanization rate data for 2007---2017, and compared with the urbanization level valuesobtained by the model, and found that the urbanization level data and the urbanization rate data are basically Match.

Table 5

urbanization rate	urbanization level	standardization urbanization rate	standardzation urbanization level
44.94	-13.37	-1.40	-1.39
45.68	-11.60	-1.21	-1.21
46.59	-8.49	-0.88	-0.89
47.50	-6.01	-0.62	-0.63
51.27	-3.94	-0.41	-0.41
52.57	-0.94	-0.10	-0.10
53.70	2.73	0.29	0.28
54.77	5.06	0.53	0.53
56.10	10.62	1.11	1.11
57.35	13.00	1.35	1.35
58.25	12.94	1.35	1.35

IV. The relationship between Internet development and urbanization

4.1. Correlation coefficient between variables and multicollinearity analysis

Table 6 is a table of pearson correlation coefficients between variables calculated using spss. It can be seen that, except for the fact that the number of CN domain names (X5) is weaker than the level of urbanization (Y), per capita GDP (X1), China's online name scale (X2), mobile phone penetration rate (X6) and Internet penetration rate (X7) is highly correlated with the level of urbanization at a significant level of 0.01 (the absolute value of the correlation coefficient is above 0.9), while the number of websites and the number of ipv4 addresses (X4) are significantly correlated with the level of urbanization (the absolute value of the correlation coefficient is above 0.8).), indicating that the model variables are selected correctly.

Table 6

Correlation

		Urbanization level	Per capita GDP	China's online name scale (10,000)	Number of websites (million)	IPV4 address number (ten thousand)	CN domain name (ten thousand)	Mobile phone penetration rate (%)	Internet penetration rate (%)
Urbanization level	Pearson correlation	1	.989	.973	.868	.828	.642	.938	.967
Per capita GDP	Pearson correlation	.989	1	.987	.840	.867	.579	.948	.983
China's online name is 10,000	Pearson correlation	.973	.987	1	.805	.927	.501	.985	1.000
Tens of thousands of websites	Pearson correlation	.868	.840	.805	1	.573	.897	.782	.792
Tens of thousands of IPV4 addresses	Pearson correlation	.828	.867	.927	.573	1	.175	.944	.936
Tens of thousands of CN domain names	Pearson correlation	.642	.579	.501	.897	.175	1	.457	.481
Mobile phone penetration rate	Pearson correlation	.938	.948	.985	.782	.944	.457	1	.987
Internet penetration rate	Pearson correlation	.967	.983	1.000	.792	.936	.481	.987	1

Using SPSS to establish a multivariate linear model between Y and X1, X2, X3, X4, X5, X6, and X7

Table 7

Coefficient [a]

model	Non-standardized coefficient	S tandard coefficient	t	S ig.

	B	Standard error	trial version		
(constant)	-3.789	.511		-7.413	.002
Per capita GDP	.000	.000	1.790	2.541	.064
Tens of thousands of websites	-.006	.002	-.755	-2.580	.061
Tens of thousands of IPV4 addresses	5.512E-005	.000	.400	1.133	.321
Tens of thousands of CN domain names	.001	.000	.659	2.521	.065
Mobile phone penetration rate	.049	.025	1.128	1.929	.126
Internet penetration rate	-.155	.106	-1.999	-1.457	.219

a. Dependent variable: urbanization level

Table 8
已排除的变量[a]

模型		Beta In	t	Sig.	偏相关	共线性统计量 容差
1	中国网名规模万	4.777[b]	1.131	.340	.547	5.921E-005

a. 因变量: 城镇化水平

b. 模型中的预测变量: (常量), 互联网普及率, CN域名数万, 网站数万, 移动电话普及率, IPV4地址数万, 人均GDP。

According to the model, the variable of Chinese netizen size is excluded, indicating that there is serious collinearity with other variables. After removing the variables, use the remaining variables and the level of urbanization to establish a multiple linear regression equation:

$$Y=1.79x1-0.76x3+0.4x4+0.66x5+1.13x6-1.20x7$$

V. Conclusion

The process and the process of urbanization in this manuscript are discussed. The impact of urbanization is very limited. By specifically found that the standardized values understanding the relationship between the level of urbanization and the level of Internet development, this paper takes the level of urbanization as the explanatory variable and interprets the factors affecting the development of the Internet. Based on the time series data of 2007-2017, the minimum is adopted. The two-multiplication method is used to model the model, and the model fit is good, and the problem of sample data shortage and multi-colinearity between variables is effectively solved. The empirical results show that since 2007, per capita GDP, net name scale, mobile phone prevalence rate and Internet penetration rate are highly correlated with urbanization level, while the influence of website number, IPV4 address number and domain name number is not significant.

With the development of the Internet, the improvement of urbanization level cannot be separated from the influence of Internet development. To better promote the improvement of urbanization level, we must first increase the construction of information infrastructure, and secondly, we must continuously improve the people's living standards in the development process. The popularity of mobile phones and the increase in urbanization will effectively promote the popularity of the Internet. Therefore, promoting the development of mobile Internet is an important driving factor for promoting urbanization.

As of June 2017, China's rural netizens accounted for 26.7% of the total, with a scale of 201 million, urban netizens accounting for 73.3%, and the scale of 550 million, an increase of 19.88 million compared with the end of 2016, a three-year increase of 3.7%. Compared with last year, the proportion of urban netizens has further increased, and the gap between urban and rural netizens is large. Due to the complex geographical conditions, low economic income, low education level, and lack of Internet knowledge, it also hinders the

further increase of rural Internet penetration rate. At the same time, as of June 2017, the number of mobile Internet users in China reached 724 million, an increase of 28.3 million compared with the end of 2016. The proportion of Internet users using mobile phones has increased from 95.1% at the end of 2016 to 96.3%, [10]and the proportion of mobile Internet access has continued to increase. Mobile Internet access is an ideal device for rural Internet users to access the Internet, and the growth rate is very fast. In terms of the promotion of urbanization by the Internet, improvements can be made from several perspectives:

(1) Increase the construction of rural Internet industry

Nowadays, e-commerce has become the hottest industry. The rural market must be the market where e-commerce will enter the next step. As long as the construction of the logistics system is strengthened and the new model of rural Internet is developed, it will play an important role in the rural economy and further promote urbanization. At present, rural offline logistics is not perfect, and many logistics platforms have not been extended to rural areas, making the use rate of rural business transactions very low. Cooperate with the online platform, improve the offline logistics transportation system, establish an e-commerce system suitable for the rural market, and make the rural informatization truly implemented.

(2) Increase the popularity of rural Internet-related knowledge

Popularize Internet knowledge and let rural residents understand the Internet. Not only do they need to understand what the Internet is, but also teach them how to use them. Use examples to show the Internet to bring tangible benefits to the countryside and attract rural residents to actively learn Internet knowledge.

References

[1]. Ge Weimin. Network Effect---The Impact of Internet Development on the Global Economy, Shanghai Academy of Social Sciences Press, July 2004
[2]. Liu Guifang, Time and Space Analysis of Regional Differences in China's Internet, Progress in Geography, Vol. 25, No. 4, July 2006
[3]. Yu Liping, Zhou Yidong, Zhong Wei, Analysis of Factors Affecting China's Internet Development Based on PANEL DATA[J], China Soft Science, May 2007
[4]. China Internet Network Information Center. Statistical Analysis of China's Internet Development Status in 2017[R], October 2017
[5]. Wang Suzhai. Connotation Characteristics, Goals and Paths of New Urbanization Science Development[J]. Theoretical Monthly, April 2013: 165-168
[6]. Xu Chuangjun, He Guangyi, Jiang Qun. Factors Affecting China's Urbanization Process, Economic Geography, Vol. 33, No. 11 of November 2013
[7]. Li Zhenfu. Research on Comprehensive Measurement Model of Urbanization Level[J], Journal of Northern Jiaotong University, March 2003
[8]. Deng Shan. Research on the Relationship between Internet Development and Urbanization Process [J], School of Management Science, Chengdu University of Technology, 2015
[9]. Yang Wei. On the Impact of Internet Economy on National Economy and Its Development Trends, Economic Observation, No. 19, July 2015
[10]. CNNIC: Interpretation of the 40th Statistical Report on Internet Development in China in 2017, August 4, 2017