

# Correlation Analysis of Differences in Urbanization, Supply chain and Unbalanced Development of Commerce and Circulation Industry

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**Abstract.** Productivity provides the basis for the development of commerce and trade circulation by innovating the mode of production and improving the efficiency, and urbanization strengthens the influence on the development of commerce and trade circulation by improving the infrastructure. Based on the panel data of 30 regions in China from 2008 to 2018, this paper constructs a panel data model to explore the impact of urbanization difference and supply chain on the unbalanced development of trade circulation industry, will cause the trade circulation industry development level difference to enlarge 0.104 percentage point, the supply chain difference to enhance 1 unit, will cause the trade circulation industry development level difference to enlarge 0.224 percentage point. The economic development level, the level of consumption, the level of import and export trade can effectively reduce the uneven development of China's trade circulation industry.

## 1 Introduction

In recent years, due to the rapid development of the network economy, the level of supply chain of enterprises has increased substantially. At the same time, the level of urbanization in China has also increased rapidly. After years of development, china's tertiary sector of the economy account for 53.1% of the national economy and its urbanization rate is close to 60%<sup>[1]</sup>. The process of urbanization is a process of transferring people to cities and towns, and it will play a positive role in rationalizing the distribution of the trade circulation industry. The trade circulation industry in urban and rural areas will integrate organically, narrow the gap, share the fruits, expand the scale of circulation, and prosper the commodity market, we will broaden the field of consumption, promote the upgrading of consumption structure, and shift the distribution pattern and marketing mode from traditional to modern. Productivity Development can improve the efficiency of commercial circulation industry and speed up the transformation and upgrading of commercial circulation industry. <sup>[2]</sup> However, it can not be ignored that there are great differences in the development level of the commerce and trade circulation industry among different regions in China. As a basic and leading industry of the national economy, the unbalanced development of trade circulation industry will inevitably have a negative impact on the quality of China's economic development. In view of this, this article from the urbanization difference, supply chain analysis of trade circulation industry non-balanced development, in order to promote

the balanced development of China's trade circulation industry for reference.

## 2 Literature Review

The academic community on urbanization, productivity and the relevance of trade circulation industry is not much, this paper combing the existing literature, the current research literature is divided into two categories, one is the study of the relationship between urbanization and trade circulation industry. Ma Xiangyang (2018) makes a theoretical analysis of the relationship between urbanization and trade circulation industry. He believes that urbanization can promote the optimization and upgrading of trade circulation industry and the rational distribution of trade circulation industry, at the same time, it can speed up the information level of the trade circulation industry, and the trade circulation industry can support the development of urbanization. Hu Zhen et al. (2018) construct panel data model to explore the relationship between urbanization and trade circulation industry. The result shows that the relationship between urbanization and trade circulation industry is inverted "U" type. The other is the research on the relationship between productivity and trade circulation industry. Zhang Yanli (2016) makes a theoretical analysis of the relationship between productivity and the development of commercial circulation industry. He believes that the improvement of social productivity level can accelerate the process of urban-rural integration of commercial circulation industry in China, the urban-rural integration of commercial circulation industry can reduce

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transaction costs and enhance the level of social productivity. Yu Xiaoqin (2018) analyzes the impact of the development of Internet industry on the development of commerce and trade circulation industry by using China's 2003-2018 provincial panel data. The results show that Internet industry can effectively promote the automation level of commerce and trade circulation industry, promoting the development level of trade circulation industry in China. The existing studies ignore the impact of urbanization difference and supply chain disequilibrium on the development of trade circulation industry. This paper is innovative in this respect.

### 3 Urbanization difference, supply chain and trade circulation industry non-balanced Development Relations Empirical Analysis

#### 3.1 Variable selection and data source

The research emphasis of this paper is urbanization difference, supply chain and trade circulation industry non-balanced development correlation, therefore, the paper takes the non-equilibrium development of commercial circulation industry as the explanatory variable. The commonly used indicators to measure the development level of the commerce and trade circulation industry are the total transaction value of retail commodities and the annual gross product value of the commerce and trade circulation industry, however, these indicators can not directly reflect the regional differences in the development of commerce and trade circulation industry, this paper refers to the calculation method of Keeny Coefficient to calculate the difference Coefficient of the development level of commerce and trade circulation industry among different regions in China,

this is done by subtracting the average value of each region's total value of the region's business circulation industry from the region's annual value of the region's business circulation industry, and dividing it by the region's annual value of the business circulation industry<sup>[3]</sup>, the study sample is 30 provinces and cities (Hong Kong, Macao, Taiwan and Tibet), which are restricted by public data, and the data span is from 2008 to 2018. The urbanization level is expressed by dividing the urban population by the total resident population, and then the urbanization difference Coefficient is calculated by referring to the calculation method of the difference Coefficient of the development level of commerce and trade circulation industry. The supply chain, as measured by the region's tertiary sector of the economy to the region's gross domestic product, is denoted using the LNCZ. Referring to the existing literature, this paper selects the relevant control variables, the economic development level is expressed by regional GDP, the logarithmic level is expressed by LNGDP, and the resident consumption level is expressed by per capita consumption expenditure, the number is expressed by LNCOST; the level of Regional Import and export trade is expressed by regional total import and export trade<sup>[4]</sup>; the number is expressed by Inopen; the number of Resident Population is expressed by people; the number is expressed by Inpeople, all of the above data are from the National Bureau of Statistics of the People's Republic of China and Wind databases.

#### 3.2 Unit root test

The stationarity of variables must be tested in empirical analysis with time series, and regression analysis with non-stationary time series may lead to "pseudo-regression" phenomenon, the results are as follows: Table 1,

**Table 1** Results of Unit tests

Variable	LLC tests	IPS tests	ADF tests	PP tests	Result
lnbus	-7.607***	-2.444***	75.074**	217.582***	Stable
lnhz	-7.6208***	10.504	107.271***	237.587***	Stable
lncz	-6.936***	-1.7859**	65.713	197.235***	Stable
lngdp	-4.188***	-3.3203***	82.746**	328.324***	Stable
lncost	-4.135***	-5.712***	140.853***	36.457	Stable
lnopen	-6.786***	0.319	93.669***	163.983***	Stable
lnpeople	-8.189***	-0.738	64.208	152.791***	Stable

\*, \*\*, \*\*\* Indicate significant levels of 10%, 5%, and 1% respectively

As shown in table 1: LNBUS LLC test, IPS test, ADF test, PP test are -7.607, -2.444, 75.074, 217.582, respectively, lnbus is a stationary sequence. In the same way, lnhz, lncz, LNGDP, lncost, lnopen and lnpeople are all stable sequences, which can be analyzed empirically without worrying about the problem of "pseudo-regression"

#### 3.3 The correlation analysis of the main variables

The correlation analysis of the variables can clarify the correlation between the variables, the greater the correlation Coefficient means the greater the degree of correlation between the variables<sup>[5]</sup>, this paper examines the relevance of Urbanization Differences, supply chains, and trade imbalances, and the results are shown in Table 2:

**Table 2** Results of the correlation test

Variable	lnbus	lnhz	lncz	lngdp	lncost	lnopen	lnpeople
lnbus	1.000						
lnhz	0.206**	1.000					
lncz	0.249***	1.000***	1.000				
lngdp	-0.202*	1.000***	0.499***	1.000			
lncost	-0.321*	0.285***	0.381***	0.388***	1.000		
lnopen	-0.439***	0.396***	0.194***	0.296***	0.294***	1.000	
lnpeople	-0.203*	0.264***	0.257***	0.469***	0.494***	0.177***	1.000

\*, \*\*, \*\*\* Indicate significant levels of 10% , 5% and 1% respectively

As shown in table 2: the Correlation Coefficient between LNHZ and Lnbus is 0.206 and significant at the level of 5%, it shows that there is an obvious positive correlation between the difference of urbanization and the Difference Coefficient of the development level of trade circulation industry. The Correlation Coefficient between LNCZ and lnbus is 0.249 and is significant at the level of 1%, which shows that the difference Coefficient between supply chain and trade circulation industry is obviously positive correlation. The Correlation Coefficient between LNGDP and LNBUS IS-0.202 and is significant at the level of 10%, which shows that there is an obvious negative correlation between the economic development level and the difference Coefficient of the development level of commerce and trade circulation industry. The Correlation Coefficient between LNCOST and LNBUS IS-0.321 and is significant at the level of 10%, which shows that the difference coefficient between the consumption level and the development level of

commercial circulation industry is obviously negative correlation. The correlation Coefficient between lnopen and LNBUS IS-0.439 and is significant at the level of 1%, which shows that there is an obvious negative correlation between the level of import and export trade and the difference Coefficient of the development level of commercial circulation industry. The Correlation Coefficient between LNPEOPLE and LNBUS IS-0.203 and is significant at the level of 10%, which shows that there is an obvious negative correlation between the population and the difference Coefficient of the development level of commercial circulation industry.

### 3.4 Model building

First we present a scatter plot between LNNZ, LNNZ and Lnbus, as shown in figure 1:

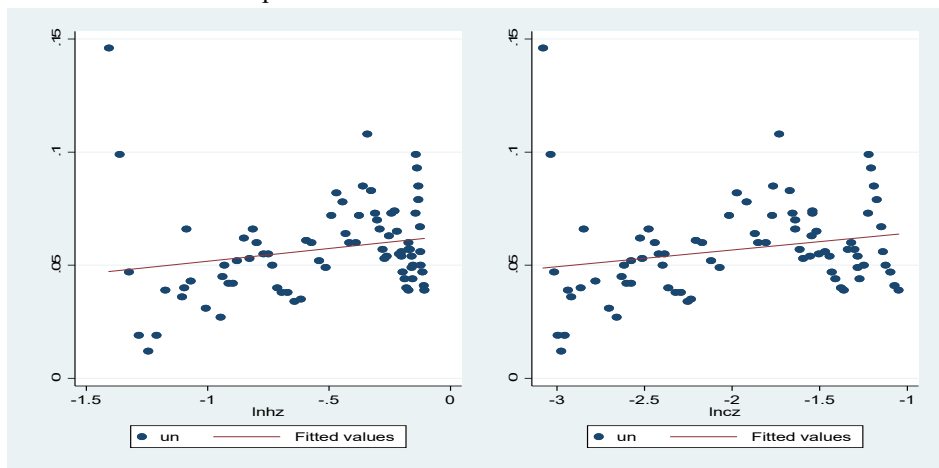


Figure 1 scatter plot of main variables as shown in figure 1: Urbanization Difference, Supply Chain and trade circulation industry development level difference coefficient between the approximate positive correlation, this paper set regression model, as shown in equation (1):

$$\ln bus_{it} = c + \beta_1 * \ln hz_{it} + \beta_2 * \ln cz_{it} + \beta_3 * \ln gdp_{it} + \beta_4 * \ln cost_{it} + \beta_5 * \ln open_{it} + \beta_6 * \ln people_{it} + \varepsilon_{it} \quad (1)$$

As shown in equation (1) , C is the constant term, lnbus is the logarithmic form of the differential coefficient of the development level of commerce and trade circulation industry, lnhz is the logarithmic form of the differential level of urbanization, lncz is the logarithmic form of supply chain, LNGDP is the

logarithmic form of the level of economic development, LNCOST is the logarithmic form of the level of consumption, lnopen is the logarithmic form of the level of import and export trade, lnpeople is the logarithmic form of the total population, is the regression coefficient, is the error item.

### 3.5 Results of the reunification

Panel data: mixed effect, random effect and fixed effect, which need F test and Housman test to judge the best regression form<sup>[6]</sup>. In this paper, the F test is 13.55 and significant at the level of 1%, which shows that the F test

rejects the original hypothesis and applies the fixed effect, and the Hausmann test is 18.46 and significant at the level of 1%, which shows that the Housman test strongly rejects the original hypothesis, that is, the fixed effect model is used in this paper. The regression results are shown in Table 3.

**Table 3:** The regression results

Inbus	Coef.	St.Err.	tvalue	p-value	[95% Conf	Interval]
lnhz	0.104	0.055	2.87	0.016	-0.007	0.214
lncz	0.224	0.061	3.39	0.009	-0.146	0.099
lngdp	-0.309	0.072	-3.13	0.004	-0.135	0.153
lncost	-0.113	0.008	-2.67	0.019	-0.029	0.003
lnopen	-0.713	0.074	-5.17	0.000	-0.161	0.135
lnpeople	-0.616	0.008	-1.92	0.359	-0.032	0.001
Constant	0.163	0.061	2.69	0.021	0.042	0.284
Mean dependent var		0.057	SD dependent var		0.021	
R-squared		0.082	Number of obs		330	
F-test		1.647	Prob > F		0.171	
Akaike crit. (AIC)		-384.796	Bayesian crit. (BIC)		-372.949	

\* , \*\* , \*\*\* Indicate significant levels of 10% , 5% , and 1% , respectively

As shown in Table 3, the regression coefficient between LNHZ and Inbus is 0.104, and it is significant at the level of 5% , which shows that there is an obvious positive correlation between the difference of urbanization and the Difference Coefficient of the development level of commerce and trade circulation industry, specifically, the urbanization differential Coefficient Increases 1 unit, will cause the trade circulation industry development level differential coefficient to rise 0.104 percentage points. The trade and circulation industry covers logistics, wholesale, retail and other industries, and relies heavily on transportation and other infrastructure facilities. The level of urbanization varies greatly, which means that the level of development of transportation and other infrastructure facilities varies greatly among different regions, the urbanization level of backward areas is difficult to meet the development needs of trade circulation industry, which restrains the development level of trade circulation industry in this area<sup>[7]</sup>. The regression coefficient between LNNZ and Inbus is 0.224, and it is significant at the level of 1%. It shows that the difference Coefficient between supply chain and the development level of commerce and trade circulation industry is obviously positive correlation, specifically, the improvement of supply chain difference by 1 unit will lead to the rise of the Coefficient of trade circulation industry development level difference by 0.224 percentage points. The Commerce and trade circulation industry is the basic and leading industry of the national economy. It is also an important part of the tertiary sector of the economy, where the level of productivity development is low, the technical and financial conditions needed for the development of its commercial circulation industry are difficult to be fully met, resulting in its low level of development and slow growth, therefore, the difference of supply chain aggravates the difference of the development level of commercial circulation industry<sup>[8]</sup>. The regression coefficient between LNGDP and LNBUS is -0.309, and it is

significant at the level of 1%. This shows that there is an obvious negative correlation between the economic development level and the difference Coefficient of the development level of commerce and trade circulation industry, specifically, the economic development level of one unit, will promote the development level of commerce and trade circulation industry differential coefficient decreased by 0.309 percentage points. The regression coefficient between LNCOST and LNBUS is -0.113, and it is significant at the level of 5%. It shows that there is an obvious negative correlation between the difference Coefficient between the consumption level of residents and the development level of commerce and circulation industry, to be specific, an increase in the level of consumption by 1 unit will reduce the Coefficient of difference by 0.113 percentage points. The regression coefficient between lnopen and lnbus is -0.713, which is significant at the level of 1%. This shows that there is an obvious negative correlation between the level of import and export trade and the difference Coefficient of the development level of commercial circulation industry, specifically, an increase in the level of import and export trade by 1 unit will promote the development of trade circulation industry difference Coefficient decreased by 0.713 percentage points. The regression coefficient between LNPEOPLE and LNBUS is -0.616, but it is not significant, which shows that the total population has no obvious influence on the coefficient.

### 4 Conclusion

An increase of one unit in the differential Coefficient of urbanization will lead to an increase of 0.104 percentage points in the differential coefficient of the development level of commerce and trade circulation industry. The urbanization level of backward areas can not meet the development needs of commerce and trade circulation industry, thus has restrained this area trade circulation

industry development level promotion. The increase of supply chain diversity by one unit will lead to a rise of 0.224 percentage point in the Coefficient of difference in the development level of commerce and trade circulation industry, it is difficult to meet the technical and capital requirements for the development of its commercial circulation industry, which leads to its low level of development and slow growth. An increase of one unit in the level of economic development will reduce the difference Coefficient of the development level of commerce and trade circulation industries by 0.309 percentage points, and an increase of one unit in the level of residents' consumption, the Difference Coefficient of the development level of commerce and trade circulation industry will decrease by 0.113 percentage point, and the difference Coefficient of the development level of commerce and trade circulation industry will decrease by 0.713 percentage point if the level of import and export trade is increased by 1 unit. The influence of the total population on the Coefficient of difference in the development of commercial circulation industry is not obvious. Therefore, this paper puts forward the following policy recommendations: First, speed up the process of urbanization, promote the level of urbanization in backward areas. The empirical analysis shows that there is a significant positive correlation between the differential coefficient of urbanization and the unbalanced development of trade circulation industry. Therefore, our government should speed up the process of Urban Hu, and improve the urbanization level of backward areas, so as to promote the balanced development of China's trade circulation industry. Second, improve productivity and optimize the supply chain. There is an obvious positive correlation between the difference of supply chain and the unbalanced development of trade circulation industry. Therefore, every region of China should expand the subsidy of financial expenditure to technological research and development, and rely on technological progress to accelerate the improvement of productivity, at the same time, we should strengthen exchanges and cooperation with developed areas, learn advanced technology, and gradually optimize our supply chain structure, thus promoting the development of trade circulation industry. Third, we will accelerate economic development and raise the level of household income. The economic development level, import and export trade and the increase of household consumption can effectively reduce the coefficient of difference in the development of commercial circulation industry. Therefore, China should speed up economic development, pay attention to the quality of economic development, and provide economic guarantee for the development of trade circulation industry. At the same time, optimize the income distribution mechanism, improve the income level of residents, and then expand the consumption level of residents, enhance the balanced development level of trade circulation industry.

## References

1. Tin Ming Ting. The impact of population mobility on the trade circulation industry — An analysis based on the spatiotemporal evolution mechanism [J]. *Research in technology economics and management*, 2019(08) : 101-105.
2. Zhang Jing. A study on the integrated development of provincial urban-rural trade circulation in the context of new urbanization [J]. *Research in Business Economics*, 2019(01) : 163-165.
3. Sun Weizeng, Wu Jianfeng, Zheng Siqi. The consumption-driven effect of location-oriented Industrial Policy: A case study of Development Zone Policy [J]. *Chinese social sciences*, 2018(12): 48-68 + 200.
4. Wang Hongping. An empirical study on the relationship between urbanization, trade circulation and household consumption. *Business Economics Research*, 2018(19): 12-15.
5. Dong yu-wen and Xu Cong-cai. A study on the transformation of the growth pattern of China's trade circulation industry: A Total factor productivity perspective. *Journal of the Beijing Technology and Business University*, 2017,32(01): 31-41.
6. Liu Weizhi. Study on the trade circulation system of two-way circulation between urban and rural areas under the background of dual economic structure [J]. *Reform and strategy*, 2016,32(09): 30-33.
7. Yang Yitao. Restraint Mechanism and strategic analysis of two-way circulation of urban and rural trade from the perspective of new urbanization. *Business Economics Research*, 2015(12) : 10-11.
8. Lai Sing Chi, Tsang Hing Kwan. A study on the interaction between urbanization and trade circulation in China — An empirical analysis based on inter-provincial panel data model. *Business Age*, 2014(25): 11-12.