

The Impact of Financial Agglomeration on Regional Economic Growth

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Abstract. Since the reform and opening up, China's market economy has been gradually opened up, the financial system has gradually matured and improved, and the development of regional economy has become more dependent on the degree of regional financial development. Further, the degree of financial development depends to some extent on regional financial structure and The degree of financial agglomeration. China also faces many difficulties in the integration and layout of financial regional resources. The impact of financial agglomeration on regional economic growth deserves further study. Based on the analysis of the current situation of financial agglomeration in China, this paper puts forward some problems of financial agglomeration in China's development. This paper uses the panel data of 31 provinces and cities from 2007 to 2016 and calculates the location entropy of the financial agglomeration index to verify the impact of financial agglomeration on China's economic development. The results show that financial agglomeration has a positive impact on the economy, and human capital, foreign trade, capital investment and fiscal expenditure are all conducive to economic growth.

Introduction

Driven by economic globalization and information technology, the international financial market has developed rapidly, international capital elements are constantly flowing to seek areas for profit and development. Finance is the core of the modern economy. As the financial services industry continues to strengthen its position in the economy, financial institutions and financial talents continue to gather in urban centers, especially in large cities. The effects of financial agglomeration on regional or urban economies are also growing. The emergence of financial agglomeration further enhances the city's comprehensive service function, which in turn promotes the growth and development of the city's economy. At present, the provinces are accelerating the pace of building financial service bases and building financial clusters, optimizing and upgrading the financial structure, aiming to promote regional economic growth through the development of finance. For example, Shanghai, Beijing, Tianjin and other places have successively proposed to build financial centers with different functions. The construction of financial centers will make financial agglomeration. In the wave of financial development to promote economic growth, it is of great theoretical and practical significance to analyze the effects of financial agglomeration on economic growth.

Analysis of the Influence of Financial Agglomeration on Regional Economic Growth

Regional Imbalance of China's Economy. There are currently three mature models for regional economic development: First, the balanced development of theoretical models, which requires each region and industry to maintain the same rate of development; Second, the mode of unbalanced development mainly refers to the speed of development and successive differences between regions and industries during the development process; Third, the mode of non-equilibrium coordinated development, which emphasizes the positive development of the regional economy and adopts a positive approach to regulate the imbalance and appropriateness to achieve the sound development of the regional overall economy.

The following picture shows the economic data map of per capita GDP of 31 provinces and municipalities directly under the central government. In 2007 (left), the eastern coastal areas, central

regions, and western regions showed obvious regional differences. The per capita GDP of the region can reach between 25,000 and 63,000. The per capita GDP of the central region is between 15,000 and 25,000, while the per capita GDP of the western region is mostly below 15,000. By 2016 (right), the per capita GDP of the eastern coastal areas and municipalities is still in a leading position, and the per capita GDP is between 58,000 and 120,000. However, compared with 2007, the per capita GDP of Shanxi, Heilongjiang and Liaoning has declined. Chongqing, The per capita GDP of Hunan has risen compared with that of 2007. Although the western region has developed, the per capita GDP is still low. Overall, according to the comparison of the eastern region has always been in an absolute leading position, the central region has benefited from the policy and its own factors have also achieved certain development, but the development of the western region is relatively slow, on the other hand, the gap between the regions is constantly The shrinking, but the imbalance of regional economic growth will still exist for a long time.

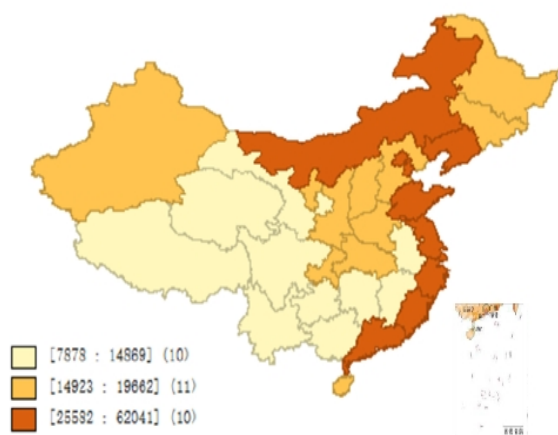


Fig. 1 Tripartite Map of Per Capita GDP(2007)

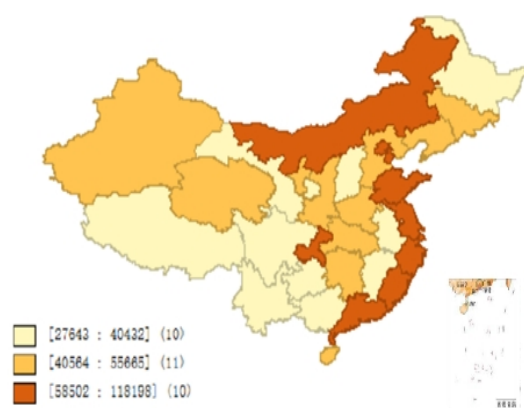


Fig. 2. Tripartite Map of Per Capita GDP(2016)

Financial Agglomeration Performance. According to the comparison of the above figure and the actual situation, as far as China's current situation is concerned, with the operation of the market economy, high-quality financial resources flow to the developed provinces and cities in the east, and the power to obtain high profits makes financial institutions highly concentrated in a certain region. No matter the type or quantity of financial institutions, there are obviously more than non-financial clusters.

The following chart shows the major changes in China's financial agglomeration from 2007 to 2016. The financial agglomeration index of the Bohai Sea Cluster has increased from 2007 to 2016, with Shandong Province steadily rising from 2007 to 2016, the Yangtze River Delta region. From 2007 to 2016, the financial agglomeration index showed a downward or volatility trend. For example, the financial agglomeration index of Jiangsu Province has declined from 2007 to 2016, and Zhejiang Province has experienced greater development.

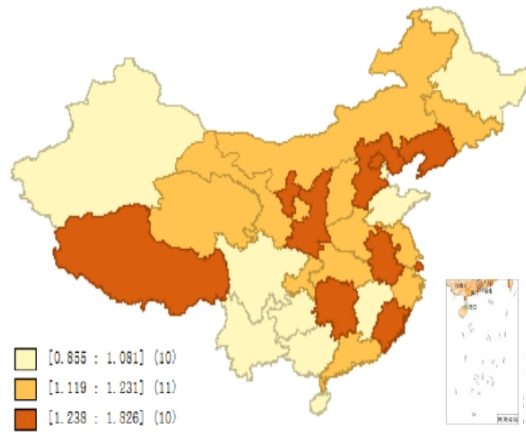


Fig.3 Tripartite Map of Financial Agglomeration(2007)

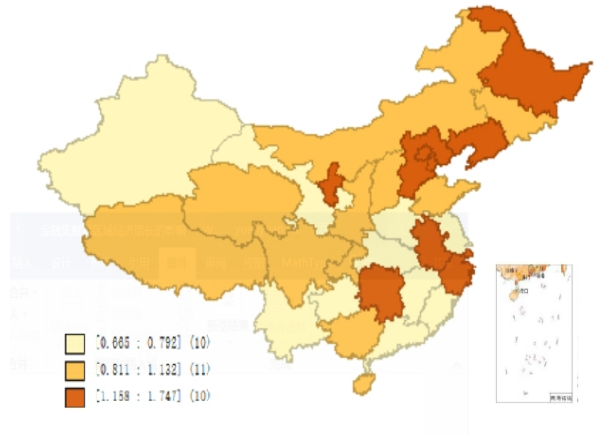


Fig. 4 Tripartite Map of Financial Agglomeration(2016)

Relevant Theory of Economic Growth

Neoclassical Economic Growth Theory. The neoclassical economic growth model was proposed by Robert Solo et al. in the 1950s. Based on the Cobb-Douglas production function, as a simplification, A, K, and N respectively represent technological progress and capital. And labor input, the production function of the economic aggregate can be expressed as:

$$Y = Ak^\alpha \cdot L^{1-\alpha} \quad (\alpha < 1)$$

The above formula shows that output depends on factor input and skill level, and more inputs can lead to more output, that is, the marginal output of labor (MPL) and the marginal output of capital (MPK) are positive. Another law of motion suggests that capital accumulation depends on investment and capital depreciation:

$$\dot{k} = sY - \delta k$$

Where sY represents total savings and δk represents total depreciation of capital. When the steady state is reached, the economic growth rate will not change, and at this time, the improvement of the technical level can break the steady state level and continue to increase economic growth.

Endogenous Economic Growth Theory. The endogenous growth AK model is proposed under the revision of the neoclassical economic growth theory. Economists believe that general human capital investment and specific research and development are the key to understanding long-term

growth. The AK model mixes physical capital and human capital. The model can be understood as a neoclassical model with no diminishing returns, $Y=AK$, where A is a constant. If the capital accumulation follows the same equation as the neoclassical economic theory, then:

$$\dot{k} = sY - \delta k$$

Data Sources and Descriptive Statistics

Dependent Variable. There are many indicators that can be used to reflect regional economic growth, such as regional GDP, GDP growth rate, GDP increase, GDP per capita, etc. This paper uses the per capita GDP of 31 regions in China from 2006 to 2017 as a reflection of regional economic development. Indicators, and will be logarithmic. Expressed in $\ln pgdp$.

Independent Variable. This paper uses the method of measuring the location entropy of industrial agglomeration to determine the level of financial agglomeration in 31 regions of China. The financial agglomeration index location entropy (LQ) refers to the ratio of the share of financial industry in a particular region to the financial share of the entire economy. If the specific area ratio coefficient is larger, the degree of financial agglomeration of the area is higher. The formula for calculating the location entropy of the financial agglomeration index is as follows:

$$LQ = (E_{ij} / E_j) / (E_{ih} / E_h)$$

Among them, E_{ij} represents the employment of the financial industry in the region j , E_j represents the total employment in the region j , E_{ih} represents the total employment of the finance in the country or the province, and E_h represents the total employment in all regions, generally considered as financial agglomeration. When LQ is greater than 1, the role of finance in this region is more important, and the development trend of financial agglomeration has been made by GeoDa in the above.

Control variable. For the capital input variable, this paper selects the whole society's fixed asset investment in each region to replace the capital input. The index is represented by INV and takes the logarithm. This paper draws on the indicators adopted by Pan Hui and other literatures to measure the degree of openness of the region by the proportion of regional commodity imports and exports to the regional GDP. This indicator is represented by TMX , and the US dollar is converted into RMB for processing. At the same time, due to the availability of data, this article uses the number of students in colleges and universities per 100,000 people, using HUM to represent, and take the logarithm. For government-level use of fiscal expenditures (GOV) to measure regional government financial input.

Table 1 Descriptive statistics for variables in 31 regions of the country

variable	samples	Mean	Standard deviation	Min	Max
GDP per capital (logarithm)	310	10.46	0.54	8.97	11.68
Financial agglomeration index	310	1.09	0.26	0.64	2.04
Fixed assets investment in the whole society (logarithm)	310	0.71	0.23	0.24	1.37
Proportion of fiscal expenditure	310	0.22	0.09	0.09	0.63
Total imports and exports	310	0.28	0.33	0.03	1.47
Number of students per 100,000 population (logarithm)	310	7.72	0.34	6.87	8.81

Empirical Analysis

In the empirical literature on economic growth, the Cobb-Douglas function is still the most commonly used production function. Therefore, the following empirical model can be obtained by combining the panel sample data used in the study:

$$\ln(pgdp) = \beta_0 + \beta_1 LQ + \beta_2 \ln(INV) + \beta_3 TMX + \beta_4 \ln(HUM) + \beta_5 GOV + \varepsilon_i$$

Empirical Analysis. Since the data selected in this paper is panel data, we perform a Hausman test. The results of the test show that the fixed effect of the panel is better than the random effect. The four panels accept the fixed effect model, but there are heteroscedasticity and sequence correlation in the residuals (the test results are slightly), and the test results are obviously better and the correlation values are improved. In this paper, the feasible generalized least squares method is used to estimate the parameters of the whole country and the three regional equations. This method can obtain effective estimation results, and the results of the regression are shown in the figure below.

Table 2 Empirical test result

Independent variable	entire country	East area	Central area	West area
LQ	0.1729*	0.2663**	0.1568**	0.1043**
LnINV	0.1377**	0.1004**	0.2419**	0.0597
GOV	1.4906**	1.5589*	1.7258**	1.5273**
TMX	0.1891**	0.1588**	0.2419**	0.1826**
LnHUM	0.7246**	0.570**	0.3483**	0.7784**
常数	1.4359**	3.5589**	3.6351**	1.9842**

From the regression results, it was found that the overall fitting effect was good and the positive and negative of the regression coefficient was also expected. From the estimation of the knot, we can see that fiscal expenditure is an important force to promote China's economic growth. Secondly, the level of human education investment and capital investment have a positive effect on China's overall economic growth. Opening up is also one of the important reasons for economic growth. Finally, financial Agglomeration is also positively promoting economic growth. It has passed the 1% significant test from the national perspective, and it also shows the function of financial agglomeration to play important financial support for China's economy.

In addition, by comparing the estimated coefficients of the three regions of the eastern, central and western regions, the results are also significant. The coefficient of capital investment for the eastern and central regions has reached 0.2663 and 0.1268, but the impact on the western region is small. From the perspective of opening up to the outside world, the effect of opening up in the central region is greater than that in other regions. It shows that as the middle zone of China's region, the open economy has further stimulated the circulation of commodities in the eastern and western regions, thus promoting China's economic growth.

By comparing the impact of financial agglomeration on the economy, it is found that financial agglomeration has a positive effect on the economy, and both pass the 5% significance test, but there are obvious differences in different regions, 0.2663 in the eastern region and 0.1568 in the central region. At 0.1043, the effect of financial agglomeration on economic growth in the eastern region is the largest, followed by the central region and the lowest in the western region. At the same time, the integration of the three regions also shows that the difference in financial agglomeration can lead to economic differences in different regions. The higher the financial agglomeration, the greater the effect on economic growth.

Summary

This paper first uses the method of computing industry agglomeration to calculate the financial agglomeration index, ie financial location entropy, and uses GeoDa to use the provincial panel data from 2007 to 2016 to study the development trend of financial agglomeration and economic level, and to study the economic growth of China through economic agglomeration. The role also further compares the extent of the contribution of financial agglomeration in the eastern, central and western regions of China to the economic growth of each region. Through the above analysis, it can be concluded that: First, financial agglomeration has a significant role in promoting the economy. Financial agglomeration in different regions can lead to regional economic growth. From the

perspective of the region, the more financial agglomerations, the economy The better the development, and vice versa. From a regional perspective, the eastern region with a higher level of financial agglomeration has a greater effect on promoting economic growth, while the central and western regions have a weaker effect on economic growth. This further illustrates the interaction between financial agglomeration and the economy. Financial agglomeration also develops with the development of the economy, and the role in the more developed regions is more obvious. Second, financial agglomeration and human capital, capital investment, degree of openness, and fiscal expenditure are also significantly different in the above equations. In the above regression equation, fiscal expenditure has a greater impact on the economy. In terms of China's economic situation, the impact of financial agglomeration on the regional economy has not yet developed into a dominant influencing factor, but only plays a supporting role in the process of economic growth, and most provinces still rely heavily on government fiscal expenditures. The path of capital investment and foreign trade, especially for the western region, where the role of human capital and government fiscal expenditure is greater than the role of financial agglomeration in economic growth, indicating that although financial agglomeration has a positive effect on economic growth, However, for China's reality, the eastern, central and western regions have different environments and development backgrounds. Financial agglomeration is not suitable for any place. It should be adapted to local conditions and cannot promote financial development but become a constraint to economic development.

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