Does Regional Financial Resource Contribute to Economic Growth? From the Perspective of Spatial Correlation Network

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Abstract
Using the method of social network analysis, this article explores the characteristics of financial resources distribution at the provincial level in China from 2000 to 2017, and analyzes the influencing factors and network effects of the spatial correlation network characteristics on distribution of financial resources, the results are as follows: The overall network characteristics of the financial resources distribution among provinces and cities in China are of low density, of high dependence and poor stability. The level of economic development, marketization, and integration are related to the spatial correlation network of the distribution of financial resources, and the level of integration and marketization have a significant positive impact on it. Due to the imbalance of economic development among regions in China, the overall network characteristics have a negative network effect on the speed of economic development. Individual network characteristics have a positive network effect on the speed of economic development. Improving network density, network correlation, and reducing network level can narrow the gap in economic development between provinces.

Keywords
financial resources, social network analysis, network characteristic, network effect, Quadratic Assignment Procedure

Introduction
Since the reform and open in 1978, China’s financial system has undergone a process of development from scratch. In this process, China’s financial resources are increasingly enriched both in terms of the broad monetary assets (funds) and the overall functions of financial institutions and financial systems. And finance is the blood of the modern market economy. Only the distribution and allocation of financial resources to the most efficient departments can fully support the economic development. Mckinnon (1973) and Shaw (1973) studied developing countries and proposed the famous Financial Repression and Financial Deepening theory. Financial Repression theory argues that financial regulation will distort the price of financial resources, reduce the liquidity of financial resources and the efficiency of capital allocation, and ultimately hinder social and economic development. The core of Financial Deepening theory is financial liberalization, whose purpose is to integrate the world financial market, thus capital can flow freely at home and abroad. Although China’s scholars have reservations about the process of financial liberalization reform, they believe that China does not have sufficient preparations for open capital projects at this stage. The free flow of capital will have a huge impact on the existing economy and the reform should be carried out step by step. But it is affirmed that financial liberalization will be the trend of China’s social and economic development, which means the restrictions on the flow of financial resources will be reduced in the future, thus change the pattern of the distribution of financial resources.

There are many studies exploring the relationship of finance and economy. Part of them focus on financial development, economy, and society, which have reached different conclusions. Xu et al. (2018) argued that financial development boosting economic growth and that high economic growth coming with the opening of the economy, which result in high-energy consumption and high CO2 emissions in Saudi Arabia. And financial instability has an insignificant
impact on CO2 emissions (Baloch et al., 2018). Some scholars argue that financial development increases resource consumption, thereby increasing environmental pollution using data from other countries (Danish et al., 2018; see also Baloch, Zhang, et al., 2019). In developed countries, the well-established financial developments allocate huge funds for research and development that bring advanced technologies in the industries and economies which use efficient energy consumption for a clean environment (Park et al., 2018). Baloch, Danish, and Meng (2019) found an inverted U-shape relationship between financial development and energy consumption. Many scholars study extensively on financial resources and divided financial resources into three levels: the broad monetary assets (funds); the financial organization system and the financial assets (tool) system; the overall function of the financial system. In the process of empirical research, most scholars take the first-level as the object. The value added of the financial industry, measurement indicator, is used most commonly, which represents monetary capital (funds) in a broad sense and financial resources.

According to China’s 2011 classification standard of national economic industry, China’s financial industry is mainly divided into four categories. The first category of financial resources provides monetary and financial services, represented by banks, which serve as important financial intermediaries to provide services to individuals and institutions, including central bank, policy bank, and commercial bank. The second category of financial resources provides capital market services, including securities market services, futures market services, and other capital market services, represented by the securities. The securities provide companies with direct financing channels, through the issuance of bonds and stocks to reduce financing costs, and grasp the initiative of financing. The third category of financial resources is the insurance industry. According to the statistics of the National Bureau, the types of insurance companies are divided into life insurance and property insurance. At the same time, insurance companies including Chinese-funded insurance, foreign-funded insurance, and sino-foreign joint insurance company. The fourth category of financial resources is other financial industries, which is a classification set by the government to adapt to the changes of financial markets and the innovation of financial products and services. Such financial industry classification standards include China’s entire financial system and financial services, and financial resources in the form of monetary assets (funds) mainly exist in the banking, securities, and insurance industries. Monetary assets (funds) in these three industries represent the financial resources distribution. The value added of the financial industry is calculated by the credit data of banking, insurance premium income, and securities industry stock transaction, which represents the development of the overall financial industry. Since the 21st century, the value-added of China’s financial industry has increased from 419.28 billion yuan in 2000 to 64074.06 billion yuan at the end of 2017, showing a gradual upward trend with a compound annual growth rate of 19.93%, and the growth rate has increased since 2006. In addition, the uneven distribution of financial resources in China’s provinces is severe, with obvious characteristics of financial resource aggregation. The value-added of the financial industry, such as Beijing, Shanghai, Jiangsu, Zhejiang, and Guangzhou, is much higher than that of other provinces; while the value-added in Jilin, Heilongjiang, Hainan, Qinghai, Ningxia, Xinjiang, and other provinces (cities, autonomous regions) is lower, the results are shown in the Figure 1. The value-added of the provincial financial in 2017 has increased significantly compared to 2000, forming areas where value-added in Beijing, Shanghai, Guangzhou, and Jiangsu Province is much higher than that of other provinces (cities, autonomous regions). This has worsened the uneven distribution of financial resources between the provinces. Finance, the core of modern economy, has inevitably become an important factor affecting the regional economic development gap. Changes in the distribution pattern of financial resources will inevitably affect the current economic development. Therefore, it is promising to study the distribution structure of financial resources and explore how the network characteristics of financial resource distribution affect economic development, which helps to lay out financial development policies in advance and to make changes in advance to promote sustained economic development.

The research on the distribution of financial resources mainly studies the related problems of the spatial difference of financial resources distribution, and the attribute data from the perspective of financial geography. The spatial distribution of China’s financial resources was extremely unbalanced based on the 2004–2013 attribute data such as deposits and premium income, forming a financial development urban agglomeration centered on Beijing and Shanghai, from the eastern region to the western region, China’s financial development has shifted from agglomeration to diffusion (Yue et al., 2019; Zeng et al., 2016). Scholars followed the analysis of financial geography and introduced the “gravity model” to identify and divide the financial center system of China’s south and north regions (Cheng et al., 2013). Through the comparative analysis of the two regional systems, the results showed that the southern system is superior to the northern system in terms of financial scale, system structure and development trend, and the distribution of financial resources in the northern and southern regions is unbalanced. Shenzhen, Shanghai, and other regions have rich financial resources, per capita financial resources far exceed the national average based on policy, geographical location, and so on (Karreman and Bert, 2009, 2012; Lai, 2012; Meyer, 2016). China’s urban network has regional characteristics, and basically formed five urban areas around the Bohai Sea, the Yangtze River Delta, and the Pearl River Delta. Beijing, Shanghai, and Shenzhen are the most important nodes in the
network, which constituted the basic framework of China’s urban network based on financial industry (Yin et al., 2011). In addition, some scholars studied the distribution and characteristics of China’s financial resources from urban agglomerations and prefecture-level cities (H. Liu et al., 2013; Ma & Lu, 2017; Qi & Zhang, 2015; Qian & Hu, 2014).

In the terms of spatial association, the main method is exploratory spatial data analysis (ESDA) and Moran’s I and LISA are the core and most widely used methods of ESDA, which can be used to describe the overall spatial association status and the local spatial association pattern, respectively. Regional income of the United States from 1929 to 1994 had strong global and local spatial autocorrelation (Rey & Montouri, 1999). The magnitude of global spatial autocorrelation and regional income distribution also showed strong synergy. Spatial autocorrelation of per capita gross domestic product (GDP) in the whole period is significant in both global and local areas (Gallo & Ertur, 2003). Sandy (2005) made an exploratory survey on the relationship between the spatial distribution of regional income and regional development funds in 145 European regions between 1989 and 1999, and found global and local spatial autocorrelation exist in the regional per capita income distribution. Spatial autocorrelation leads to the tendency of rich (poor) areas to be clustered with other rich (poor) areas. In addition, ESDA has been applied to other issues in China, such as urban green development efficiency and the relationship between financial development and income inequality (Jung and Chu-Ping, 2019; M. H. Li et al., 2019).

Traditional econometric methods based on attribute data can not reveal the spatial structure of financial resources distribution, nor can they reveal the impact of key correlation, while which often determines the attribute data. Therefore, Zhang et al. (2018) used Social Network Analysis (SNA) method to study the relationship data of financial resources distribution. Attractiveness of provincial capital cities and port cities as financial centers is gradually increasing, and the gap with other cities in attracting external financial resources is widening. These regions have accumulated more financial resources. Recent studies on the evolution of urban agglomeration network from three levels: spatial difference, spatial process and spatial interaction, based on three main financial resources industries: banking, insurance, and securities (Han et al., 2019; Zhao et al., 2019).

Based on previous studies, we can find that: first, the focus of research in the literature of financial resources is financial agglomeration, which is less concerned about the distribution of financial resources under the background of financial agglomeration. Then, for the spatial association of financial resources distribution, the ESDA method is usually used to analyze attribute data, which are not help for understanding the characteristics of spatial association and lack the study of “relational data.” In addition, previous studies generally neglect the factors that influence the exploration of spatial association, and fail to explain the formation factors of spatial association and network characteristics. Finally, after describing the network characteristics of financial resources distribution and analyzing the influencing factors, previous studies using SNA method does not consider what effects the spatial association network characteristics of financial resources distribution can make, that is, lack of attention to the network effects. Relational data can often determine attribute data. Using SNA, we can study the distribution of financial resources from the perspective of network, observe the density of financial links among regions, and analyze the impact of network characteristics. Compared with attribute data, it is more novel to study from the perspective of network relational data, and it is more able to
analyze the distribution of financial resources from the overall perspective.

**SNA and QAP Method**

The SNA is a comprehensive analysis strategy. It is a paradigm that studies the allocation and flow of resources, objects, and locations through social relationship forms, and is a unity of theories and methods that focus on the analysis of social relationship structures. SNA is an interdisciplinary analysis method for researching the relationship between research objects. This method has a clear research paradigm and is widely used in the fields of sociology, communication, information science, education, and economics.

As SNA is a research method for analyzing relationships, before analyzing the distribution of financial resources, we must first measure the spatial relationship. Using the existing method of constructing the coefficient matrix, we choose to use the gravity model to construct the relationship matrix. Constructing the relationship matrix through the gravity model contains considerations of the economic geographical distance between regions, and is more suitable for this study. Referring to the optimization calculation method of gravity model stated by (X. Li, 2011), the parameter $k$ is introduced for correction. The corrected gravity model is as follows:

$$y_{ij} = k_{ij} \frac{\sqrt{P_i F_j} \sqrt{P_j F_i}}{D_{ij}^3}, k_{ij} = \frac{F_i}{F_i + F_j}$$

where $y_{ij}$ represents the spatial association between the distribution of financial resources of region $i$ and region $j$; $k_{ij}$ is the contribution rate of regional $i$ to the spatial distribution of financial resources between the two regions; $P_i$ and $P_j$ are the populations of the two regions, respectively; $F_i$ and $F_j$ represents the total amount of financial resources in the two regions, respectively; $D_{ij}$ is the linear distance calculated using the latitude and longitude coordinates between the provincial capital cities of the two provinces.

Through calculation, the gravitational matrix of spatial association between provinces (municipalities and autonomous regions) from 2000 to 2017 can be obtained. In order to analyze the network characteristics of spatial association using SNA, multi-valued matrices need to be transformed into binary matrices expressing a relationship. Using the multivalue matrix dualization method, the average value in the gravitational matrix of each year is selected as the critical value, and compared with each lattice value, the lattice value higher than the average value is recorded as “1,” indicating the province has a significant spatial association with the distribution of financial resources in its corresponding provinces; or the value is recorded as “0,” indicating that the spatial association of the province’s financial resources distribution to its corresponding provinces is not significant.

**Analysis of the Overall Network Structure**

The overall network characteristics are showed by network density, network correlation degree, network level, and network efficiency. Among them, the network density reflects the affinity of the network relationship between different regions, and represents the quantity and complexity of the network relationship. The more the relationship among the whole network, the greater the network density, the greater the impact of the spatial network structure of financial resources on each node member. The degree of network correlation degree reflects the robustness and vulnerability of the network structure itself. The more contact paths exist between provinces in the network, the more choices can be made to contact a province through the network, the greater the network correlation degree, the more robust the network.

If the links between more provinces in the network need to be connected through one or two central provinces, the overall network structure will have a strong dependence on a few central provinces. Once the central area is excluded, the network may collapse. It is fragile and has a low degree of network correlation degree. The network level is for the directed network, indicating how much asymmetry is reachable between the regions in the network, and embodies the hierarchical structure between the regions, whether it is dominant or subordinate. Network efficiency is how much redundant association exists when the composition of the network is determined. The higher the network efficiency, the less redundant associations in the overall network, the worse the network stability, and the fewer channels that are associated with each other. The lower the network efficiency, the more financial resources in the province have more spillover channels and the network structure is more stable.

**Analysis of Individual Network Structure**

Individual network characteristics are mainly measured by degree of point centrality, betweenness centrality, and closeness centrality, which are used to describe the role of each node in the network. Degree of point centrality measures whether a region is in the center of the whole network according to the number of connections in the network. The higher the degree of point centrality, the more central the region is in the network. Betweenness centrality measures a region’s ability to control resources. If a region is in the shortest path between other regions in the whole network, it will become a “bridge” to communicate with other regions and act as a “middleman.” The closeness centrality measures the ability of a region not controlled by other regions. It describes the sum of the shortcut distances between a region and other regions in the whole network. The higher the closeness centrality, the less the region is affected by other regions.
Block Model Analysis of Financial Resource Distribution

Block model uses iterative correlation convergence (CONCOR) algorithm to divide the network into several subgroups which become “blocks.” Block model can distinguish the roles played by each region in the study of financial resource distribution. Network members can be divided into four parts: bidirectional spillover plate, net beneficiary plate, net spillover plate, and broker plate. When there are more relationships between the internal members of the bidirectional spillover plate, more relationships are made to the external members of the board, but there is not much external relationship received. This section has a two-way overflow effect on the financial resources inside the board and other sectors. While there are more relations between members within the net beneficiary plate, there are more relationships received from external members and fewer spillover effects on other plates. While the number of relationships issued between members of the net spillover plate is small, the relationship is issued to external members, and the relationship of receiving external members is less. While there are fewer relationships between members of the broker plate, it serves as a bridge to issue and accept relationships with external members.

Analysis of Influencing Factors of Financial Resources Spatial Structure

The QAP (Quadratic Assignment Procedure) can study the relationship between relational data and is widely used in SNA (J. Liu, 2000). QAP correlation analysis and QAP regression analysis are used to study the influencing factors of financial resource distribution.

QAP correlation analysis is based on the replacement of the matrix, and calculates the correlation coefficient by comparing the similarity of each grid value in the two square matrices and then performs nonparametric test on the correlation coefficient. The calculation process is divided into three steps. First, the correlation coefficient between the long vectors formed by the two matrices is calculated. Second, perform random replacement of the rows and corresponding columns of a matrix at the same time, then calculate the correlation coefficient between the replaced matrix and another matrix, save the calculation structure, and repeat this process several times to get a correlation coefficient distribution. In this process, we can get the proportion of multiple correlation coefficients calculated after this random replacement that is greater than or equal to the correlation coefficient calculated in the first step. And QAP regression analysis can study the regression relationship between matrices. The calculation process is divided into two steps. First, perform a standard multiple regression analysis on the corresponding elements of the independent variable matrix and the dependent variable matrix. Then randomly replace each row and each column of the dependent variable matrix at the same time, and perform regression again to obtain all coefficient values and determination coefficient values. Repeat the above process several times to estimate the standard error of the statistics.

Network Characteristics Analysis of Spatial Distribution of Regional Financial Resources

Data Resources

The data in this article come from the statistical yearbooks of China’s provinces from 2000 to 2017, the China Financial Yearbook, the Wind database (https://www.wind.com.cn/), and the website of the National Bureau of Statistics (http://data.stats.gov.cn/), due to the trading data in the securities market of the Tibet are missed, so 30 provinces (municipalities and autonomous regions) are selected as samples. According to the broad definition of financial resources in the theory of financial resources, the financial resources in the form of monetary fund exist mainly in the banking, securities, and insurance industries. The use of monetary funds in these three industries is representative of the financial resources distribution. Therefore, the provincial financial resources in this article include the deposit balance and the loan balance of banking financial institutions at the end of the year, the premium income of all insurance institutions in the insurance industry, and the total transaction volume of the securities industry. Among them, the trading volume of securities market includes the trading volume of A share and B share, the trading volume of funds, the spot, and repurchase of Treasury bonds, and the trading volume of financial bonds and corporate bonds.

Overall Network Characteristics

After calculating the total amount of financial resources in each region according to gravitational model (1), the overall network characteristics of spatial association of financial resources distribution in China’s provinces and cities from 2000 to 2017 can be obtained by using Ucinet 6.186 (www.analytictech.com). From the results of Table 1, we can see that the network density of the whole network shows a downward trend and then an upward trend. From 2000 to 2007, the number of network relationships among provinces (municipalities, autonomous regions) gradually decreased, and the overall network connection became sparser. After 2007, the network connection gradually increased, and the network density increased slightly. The fluctuation frequency of network correlation degree is relatively low. Except from 2006 to 2012, it also dropped to 0.7471 in 2014. In other years, the network correlation degree is 0.8069. Although the degree of network correlation is generally high, it can be found that the dependence of the provinces (municipalities and autonomous
regions) on the important correlation points is strong through the visualization chart (Figure 1), which is easy to reduce the stability of the network. The network level fluctuates greatly and fluctuates around the average of 0.42, and the value is between 0.2 and 0.6. This shows that the network has certain level attributes, and the spatial association of financial resources has asymmetric spillover effect. The change frequency of network efficiency index is relatively high, showing a trend of first rising, then declining and finally rising. The overall network efficiency is greater than 0.75, which indicates that there are fewer spillover channels in the spatial distribution of financial resources, relying on key network connection points, and the overall network structure is fragile. Using Netdraw 2.14 (www.analytictech.com) software to visualize the data after dualization in 2000 and 2017, as shown in Figure 2, it can be observed intuitively that Qinghai, Ningxia, and Xinjiang are isolated, there is no spatial association with other provinces (municipalities or autonomous regions).

**Individual Network Characteristics**

Individual network characteristics indicators of spatial association of financial resources are shown in Table 2.

The table is arranged in order of degree of point centrality from high to low. It can be seen that the provinces (municipalities, autonomous regions) in the top ranking also have a high degree of point centrality, closeness centrality, and betweenness centrality, which shows that Guangdong and Jiangsu are in the central position in the distribution network of financial resources and have a strong control over financial resources, while they are not easily affected by other provinces. Betweenness centrality in some provinces is 0, which indicates that some provinces are vulnerable to be influenced and control by other provinces. Of the top 15 provinces, 8 provinces are in the eastern region, 6 provinces in the central region and 1 in the western region. The control ability of the eastern region to the distribution of financial resources is higher than that of the central and western regions, and the central provinces of the financial resource distribution are mainly concentrated in the eastern region.

Jiangsu, Guangdong, Shandong, and Henan’s degree of point centrality are greater than 50, which is far more than other provinces (municipalities, autonomous regions), indicating that the four provinces have more spatial linkages of financial resources, are in a relatively central position in the network. These 4 provinces have a higher closeness centrality and betweenness centrality and strong power to control financial resources. Gansu, Hainan, and Heilongjiang, which are located at the edge of the spatial association network of financial resources, indicating the characteristics of less association paths and easy to be influenced by other provinces. Qinghai, Ningxia, and Xinjiang belong to isolated provinces with 0 degree of point centrality, closeness centrality, and betweenness centrality. Although the economic development level of Beijing and Shanghai is relatively high, they are not at the top of the individual network indicators. What factors affect the spatial association network of financial resources deserves further study.

The eastern region has a high degree of point centrality, closeness centrality and betweenness centrality, which results in a strong power to control financial resources as a whole, while the betweenness centrality in the central region and the western region is far lower than that in the eastern

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**Table 1. Overall Network Characteristics of Spatial Association of Financial Resources Distribution in China’s Provinces From 2000 to 2017.**

| Year | Network density | Network correlation degree | Network level | Network efficiency |
|------|----------------|---------------------------|--------------|--------------------|
| 2000 | 0.1713         | 0.8069                    | 0.511        | 0.7631             |
| 2001 | 0.1724         | 0.8069                    | 0.511        | 0.7631             |
| 2002 | 0.1655         | 0.8069                    | 0.4663       | 0.7723             |
| 2003 | 0.1598         | 0.8069                    | 0.511        | 0.7785             |
| 2004 | 0.1609         | 0.8069                    | 0.3769       | 0.7785             |
| 2005 | 0.1552         | 0.8069                    | 0.426        | 0.7908             |
| 2006 | 0.1575         | 0.7471                    | 0.2781       | 0.7733             |
| 2007 | 0.154          | 0.7471                    | 0.4332       | 0.7833             |
| 2008 | 0.1586         | 0.7471                    | 0.4351       | 0.78               |
| 2009 | 0.1609         | 0.7471                    | 0.4369       | 0.7733             |
| 2010 | 0.1563         | 0.7471                    | 0.4416       | 0.77               |
| 2011 | 0.1563         | 0.7471                    | 0.4416       | 0.7733             |
| 2012 | 0.1598         | 0.7471                    | 0.3917       | 0.7667             |
| 2013 | 0.1933         | 0.8069                    | 0.4222       | 0.7785             |
| 2014 | 0.1632         | 0.7471                    | 0.3854       | 0.77               |
| 2015 | 0.1678         | 0.8069                    | 0.2688       | 0.7846             |
| 2016 | 0.1701         | 0.8069                    | 0.4222       | 0.7754             |
| 2017 | 0.169          | 0.8069                    | 0.4222       | 0.7785             |
Figure 2. (A) Provincial correlation path after data dualization in 2000 and (B) provincial correlation path after data dualization in 2017.

Table 2. Individual Network Characteristics of Spatial Association of Financial Resources Distribution in China’s Provinces in 2007.

| Regions      | Provinces | Degree of point centrality | Closeness centrality | Betweenness centrality |
|--------------|-----------|----------------------------|----------------------|------------------------|
| Eastern region | Jiangsu   | 58.621                     | 23.2                 | 16.824                 |
| Eastern region | Guangdong | 55.172                     | 22.656               | 23.611                 |
| Eastern region | Shandong  | 55.172                     | 22.835               | 13.99                  |
| Central region | Henan     | 51.724                     | 22.481               | 6.885                  |
| Central region | Hubei     | 37.931                     | 21.642               | 0.733                  |
| Eastern region | Zhejiang  | 34.483                     | 21.481               | 0.167                  |
| Central region | Anhui     | 34.483                     | 21.481               | 0.167                  |
| Eastern region | Jiangxi   | 34.483                     | 21.481               | 0.167                  |
| Eastern region | Shanghai  | 31.034                     | 21.324               | 0.095                  |
| Central region | Hunan     | 31.034                     | 21.481               | 0.611                  |
| Western region | Sichuan   | 31.034                     | 21.324               | 10.205                 |
| Eastern region | Beijing   | 27.586                     | 20.714               | 1.723                  |
| Eastern region | Hebei     | 24.138                     | 20.28                | 0.369                  |
| Eastern region | Fujian    | 24.138                     | 20.863               | 0                      |
| Central region | Shanxi    | 20.69                      | 20.139               | 0.237                  |
| Western region | Shanxi    | 17.241                     | 20.567               | 0.242                  |
| Eastern region | Liaoning  | 17.241                     | 20.28                | 11.823                 |
| Eastern region | Tianjin   | 17.241                     | 20                   | 0                      |
| Central region | Neimenggu | 13.793                     | 19.463               | 0                      |
| Western region | Guizhou   | 13.793                     | 19.595               | 0.082                  |
| Western region | Chongqing | 10.345                     | 19.463               | 0                      |
| Western region | Yunnan    | 10.345                     | 19.463               | 0                      |
| Central region | Jilin     | 6.897                      | 17.365               | 0                      |
| Central region | Heilongjiang | 6.897                | 17.365               | 0                      |
| Eastern region | Guangxi   | 3.448                      | 18.954               | 0                      |
| Eastern region | Hunan     | 3.448                      | 18.954               | 0                      |
| Western region | Gansu     | 3.448                      | 18.012               | 0                      |
| Western region | Qinghai   | 0                         | 0                    | 0                      |
| Western region | Ningxia   | 0                         | 0                    | 0                      |
| Western region | Xinjiang  | 0                         | 0                    | 0                      |
region and is in a passive state of acceptance. This situation is not conducive to the overall network stability, and aggravates the regional differences in the distribution of financial resources.

**General Relational Model of Spatial Linkage of Regional Financial Resources**

The spatial association network of financial resources distribution in China in 2017 is divided into four parts, and the block model is used to analyze the iterative CONCOR. The first plate includes seven members of Beijing, Tianjin, Hebei, Shanxi, Neimenggu, Liaoning, and Shaanxi. The number of internal relations is 15, the number of relations issued to other plates is 11, and the number of relations received from other plates is 21. The second plate includes 11 members of Jiangxi, Shanghai, Jiangsu, Shandong, Anhui, Fujian, Hubei, Hunan, Henan, and Guangdong. The number of internal relations is 81, the number of relations issued to other plates is 26, and the number of relations received from other plates is 12. The third plate includes five members, Heilongjiang, Jilin, Qinghai, Ningxia, and Xinjiang. The number of internal relations is 2, the number of relations issued to other plates is 0, and the number of relations received from other plates is 21. The fourth plate includes seven members, namely, Guizhou, Yunnan, Guangxi, Gansu, Hainan, Chongqing, and Sichuan. The coefficients are 7, the relationship number for other plates is 4, and the relationship number for other plates overflow is 7, as shown in Table 3.

The distribution of financial resources in China is divided into four parts according to the block model. The actual proportion of internal relations is larger than the expected proportion of internal relations. Therefore, there is no net spillover and broker plate in interprovincial financial resources. According to the classification method of the block model, the four major plates in China should belong to the main income plate, that is, there are more relations between the internal members of the plate, more relations between the external members and less spillover effects on other plates. There are close financial links between provinces (municipalities and autonomous regions) within the plate. There are more relations between the members of the plate issuing and receiving internally, and less links with provinces (municipalities and autonomous regions) outside the plate. The reason for this phenomenon is that China's financial resources are concentrated in the eastern region, resulting in a large gap in financial distribution between regions. In terms of overall network characteristics, network connection paths are strongly dependent, and need to be linked through specific intermediary provinces and municipalities. At the same time, the network has a certain level degree, resulting in one-way spillover between some provinces and municipalities, loose inter-provincial links, and low overall network density. We will further explore why the distribution of financial resources shows such a trend, and explore the influencing factors of the formation of spatial correlation structure.

**QAP Analysis**

Based on the existing research results (Ji et al., 2014; F. Q. Li et al., 2008; Zhang et al., 2012) and data availability, this article selects the following four factors: first, the level of economic development. The relationship between finance and economy promotes and influences each other. Areas

| Table 3. Plate Relations of Regional Financial Resources Distribution in 2017. |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Block classification | First block | Second block | Third block | Fourth block | Numbers | Expected internal relationship ratio % | Ratio of actual internal relations % |
|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| First block       | 19              | 11              | 2              | 0              | 7              | 20.69           | 146.15          |
| Second block      | 19              | 68              | 0              | 6              | 10             | 31.03           | 272.00          |
| Third block       | 0               | 0               | 5              | 0              | 7              | 20.69           | 0              |
| Fourth block      | 1               | 0               | 0              | 4              | 6              | 17.24           | 400            |

| Table 4. Estimated Results of Influencing Factors of Financial Resources Spatial Correlation Network in 2017. |
|----------------------------------------------------------|
| Factors                        | Representative variable | QAP correlation analysis | QAP regression analysis |
|--------------------------------|-------------------------|--------------------------|-------------------------|
| Level of economic development | GDP difference          | 0.168***                 | 0.058***                |
| Level of globalization         | Foreign direct investment difference | 0.119***                 | -0.048*                 |
| Level of marketization         | Import and export volume difference | 0.187***                 | 0.175***                |
| Level of integration           | Interprovincial proximity to 0-1 network | 0.456***                 | 0.456***                |
| $R^2$                          |                         |                          | 0.245                   |

*Note. QAP = Quadratic Assignment Procedure; GDP = gross domestic product. * $p < .10$. *** $p < .01$.
with higher levels of economic development have greater
demand for funds, it is easy to promote the development of
financial industry, and attracts financial resources concentra-
tion, while financial resources distribution concentration can
effectively support regional economic development. We
select provincial GDP to reflect economic development fac-
tors. Second, the level of globalization. Globalization has
accelerated the global flow of financial resources and pro-
moted regional financial diversification. Under the back-
ground of globalization, regions with better economic
foundation are more likely to attract the agglomeration of
financial resources, and then form financial centers. We
select foreign direct investment from various provinces to
reflect the factors of globalization. Third, the level of mar-
ketization. In areas with higher market-oriented level, the
government has less intervention in the economy, and the
market can give full play to the role of resource allocation,
thus affecting the distribution of financial resources. We
select the import and export volume of each province to
reflect market-oriented factors. Fourth, the level of integra-
tion. The flow of financial resources between provinces is
often affected by geographical location, provinces with close
geographical distance, and interconnected provincial bound-
aries are more likely to have financial links. And 0 to 1
matrix is selected to reflect the integration factors.

This article uses Ucinet 6.186 (http://www.analytictech.
.com/) to estimate the QAP model.

The results of QAP correlation analysis show that the spa-
tial association network structure of financial resources dis-
tribution is related to the level of economic development,
globalization, marketization, and integration, respectively,
and is statistically significant at the level of 1% significance.
Among them:

1. The standardized regression coefficient of marketiza-
tion level is 0.175, which is significant at 1% signifi-
cance level, indicating that the liquidity of financial
resources in the market affects the spatial association
network of financial resources distribution. The
higher the level of marketization, the easier to estab-
lish links with other regions, but also easier to form a
concentration of financial resources, and the stability
of the financial market is stronger. Regions with high
level of marketization are relatively sound and per-
fet in both economic and financial operation sys-
tems, and have quite a lot of financial innovation
tools, and financial institutions have a high sense of
innovation. However, in areas with low level of mar-
ketization, there are still some phenomena in which
government regulation replace the market. Financial
institutions lack the spirit of innovation and the
motive force for development. In addition, from the
perspective of financial resource liquidity and profit-
seeking, monetary capital always pursues the greatest
rate of return. The regional infrastructure and
services with high marketization level are perfect,
and these areas have a higher return on investment
and better investment opportunities. To obtain higher
returns, financial resources will turn to regions with
higher levels of marketization, and there is a clear
“Matthew effect.”

2. The standardized regression coefficient at the level of
integration is 0.456, which is significant at the level
of 1%, indicating that the geographical distance and
administrative boundary between provinces have an
important impact on the distribution of financial
resources. The closer the geographical distance is,
the more easily the financial resources between prov-
inces adjacent flow across provinces, and the impact
of the areas rich in financial resources on adjacent
areas is greater than that of remote areas. The main
reasons for this phenomenon are as follows: (a)
China’s current financial supervision system is a dis-
patched agency system, which usually only supervi-
ses the institutions in the jurisdiction, and is
responsible for the financial security and stability of
the jurisdiction. It also strictly restricts the business
operations and business operations of financial insti-
tutions, prohibits the mixed operation of various
institutions, and is not conducive to cross-regional
expansion and cooperation. This will undoubtedly
reduce the vitality of financial resources flow, which
is not conducive to the flow of financial resources to
remote areas. (b) For the financial institutions them-
selves, the flow of their own resources is more
inclined to the areas adjacent to them. The adjacent
areas often have the same level of financial infra-
structure, financial environment policies and, most
importantly, more transparent information, which is
conducive to financial institutions to reduce their
operational risks promote development.

3. The standardized regression coefficient at the level of
globalization is −0.048, which is significant at the
level of 10%, indicating that globalization has a
slightly negative impact on the spatial association
network of financial resources distribution. This
means that the FDI funds are digested within the
provinces, not spill over to the surrounding provinces
to form financial links, and even increase the differ-
cences in the distribution of financial resources, which
has a negative impact on the overall structure. Good
financial market environment provides good finan-
cial services for enterprise financing, transforming
potential spillover effects into real productivity.
Service facilitation is conducive to promoting inter-
national capital flows, reducing capital costs, and
increasing capital return, thus promoting FDI inflows.
Some studies also confirmed the sound financial sys-
tem and the developed capital market can not only
effectively stimulate the increase of savings rate,
promote capital accumulation, improve the conversion rate of savings and investment but also help to reduce information asymmetry and investment risk, improve the investment prospects of enterprises, and increase the rate of return, so as to enhance the attractiveness of foreign investment, it has been noted by Pierre and Weill (2010). Although China has undergone more than 40 years of reform and opening-up, there are still obvious regional economic differences, among which the eastern region has a high level of economic development, perfect infrastructure, and a large gap between the central and western regions. These factors lead to the tendency of foreign capital to gather in areas with better economic surroundings, which in turn will enrich the financial resources in these areas, and the regional distribution of financial resources is increasing. In addition, FDI has always been an important resource for regional government to compete (Drifte, 2009; Oman, 2000). Based on the achievements of local officials and the purpose of regional development, provinces and regions will introduce foreign capital through tax revenue, preferential land prices, and other measures, which will significantly reduce foreign capital in adjacent areas, and it will be difficult for foreign capital to spill over to the surrounding provinces to form financial links.

4. The standardized regression coefficient of economic development level is 0.058, which is significant at the level of 10%. This shows that economic development has a slightly positive impact on the spatial association network of financial resources distribution, that is, the areas with higher economic development level are more likely to gather financial resources. The level of economic development of a region not only determines the GDP of the region but also determines the income level, social investment, and savings level of the people in the region. These factors will directly affect the financial resources abundance of the region. Take bank as an example, the higher the level of economic development in a region, the higher the scale of deposit and loan, the larger the business volume, and the faster the development of itself. In addition, different levels of economic development have different “threshold effect” of financial resources. Greenwood and Smith (1997) found that financial intermediaries and financial markets develop with the increase of per capita income and per capita wealth when introduced fixed entry fees and fixed transaction costs into the model. Therefore, in areas with relatively low economic development level, per capita income and wealth will make people unable to pay a fixed entry fee, or even be able to pay but the transaction volume is too small to compensate for transaction costs, so they will not be able to set up and use financial intermediaries and financial markets, financial resources are therefore less.

Analysis of the Network Effect

SNA is a method of analyzing relational data. Relational data can describe the structural characteristics of network members more clearly, and structural characteristics often determine the performance of attribute data. Chen (2011), Nawaz et al. (2019), Cho (2012) have made extensive studies on how finance affects economic development, but most of them start from the perspective of attribute data. Therefore, after analyzing the spatial association network of financial resources distribution, we further explore how the network characteristics of financial resources distribution affect economic development, and analyze the network effects of the overall network characteristics and individual network characteristics on economic development.

Global Network Effect Analysis

The overall network characteristics include four indicators: network density, network correlation degree, network level, and network efficiency. In this article, ordinary least squares (OLS) regression analysis is carried out on the four indicators and economic development indicators, respectively, and the network effect of the four indicators on economic development is explored. GDP growth rate is used as a measure of economic development speed. Gini index is used to measure the difference of economic development.

Network effect of global network characteristics on GDP growth rate. Before using Eviews 8.0 software (http://www.eviews.com/home.html) for regression, the stationarity of data is tested to prevent false regression. Unit root and cointegration tests were carried out on the overall network characteristics and economic development indicators. The results are shown in Tables 5 and 6. Among them, MD represents network density, GLD represents network correlation degree, DJD represents network level, WLXL represents network efficiency. From the test results, it can be found that at the 5% significance level, the overall network characteristics and economic development indicators are all integrated of order. Through Johansen cointegration test, there exists a cointegration relationship.

As is shown in Table 7:

1. Network density has a greater impact on the speed of economic development. Network density is negatively correlated with the speed of economic development. The main reason is that the spatial correlation of China’s financial resources distribution shows that there are more linkages in the eastern region, and fewer linkages in the northeast and western regions. Therefore, the increase in network density is mainly
due to the increase in the number of contact paths between the eastern and central regions. Combined with China’s economic development, the GDP growth rate of each province in 2018 shows that GDP growth rates in the regions with higher economic development levels, such as Beijing, Shanghai, and Guangzhou, were 6.6%, 6.6%, and 6.8%, respectively. However, the GDP growth rates of regions with low economic development level, such as Guizhou, Ningxia, and Qinghai, were 9.1%, 7%, and 7.2%, respectively. The reason is that areas with a high level of economic development have a large economic volume and a low development speed, areas with a low level of economic development have a relatively small economic volume and the development speed is relatively fast. Therefore, the network density index is inversely proportional to the economic development speed.

2. Network correlation degree and network efficiency are both indicators of overall network stability. The more connections exist between regions, the higher the degree of network correlation, and the more robust the whole network. The estimated results show that network correlation degree has a negative impact on the economic development speed. The reason is that increasing the network connection path means

Table 5. Unit Root Test of Overall Network Characteristic Indicators.

| Indicator                      | Stat.   | P value |
|--------------------------------|---------|---------|
| GDP                            | -1.33   | .611    |
| First-order difference sequence of GDP | -8.255*** | 0       |
| MD                             | -2.731* | .074    |
| First-order difference sequence of MD | -6.498*** | 0       |
| GLD                            | -2.04   | .269    |
| First-order difference sequence of GLD | -6.819*** | 0       |
| DJD                            | -2.254  | .19     |
| First-order difference sequence of DJD | -7.240*** | 0       |
| WLXL                           | -2.421  | .14     |
| First-order difference sequence of WLXL | -8.252*** | 0       |

Note. GDP = gross domestic product; MD = network density; GLD = network correlation degree; DJD = network level; WLXL = network efficiency. *p < .10. ***p < .01.

Table 6. Cointegration Test of Overall Network Characteristic Indicators.

| Hypothesized no. of CE(s) | Eigenvalue | Trace statistic | .05 Critical value | Prob.*** |
|---------------------------|------------|-----------------|---------------------|---------|
| None*                     | 0.448      | 112.545         | 69.819              | 0       |
| At most 1*                | 0.408      | 73.877          | 47.856              | 0       |
| At most 2*                | 0.283      | 39.838          | 29.797              | .003    |
| At most 3*                | 0.171      | 18.235          | 15.495              | .019    |
| At most 4*                | 0.088      | 6.02            | 3.841               | .014    |

*p < .10. ***p < .05.

Table 7. Results of OLS Regression on Economic Growth Rate.

| Model                        | (1)    | (2)    | (3)    | (4)    |
|------------------------------|--------|--------|--------|--------|
|                              | Coefficient | P value | Coefficient | P value | Coefficient | P value | Coefficient | P value |
| Constant term                | 29.540*** | 0      | 30.502*** | 0      | 9.603*** | 0      | -41.713*** | .009   |
| Network density              | -124.230*** | 0      | -127.341*** | 0      | -1.035 | .773   | 65.636*** | .004   |
| Network correlation          |        |        |        |        |        |        |        |        |
| Network level                |        |        |        |        |        |        |        |        |
| Network efficiency           |        |        |        |        |        |        |        |        |
| R²                           | .339   | .176   | .001   | .058   |

Note. OLS = ordinary least square. ***p < .01.
increasing the connection path between eastern and western regions. Similar to the network density index, it will have a negative effect on the economic development speed index. The improvement of network efficiency represents the reduction of redundant association paths in the whole network. The index itself has the opposite relationship with the network correlation degree, so it has a positive impact on the speed of economic development. The network level is not significant in the estimated results, but to show the integrity of the results, we choose to retain the insignificant variables.

The network effect of the overall network characteristics on economic development does not suggest that we should cut off the financial links between regions, reduce the network density of financial resources distribution and reduce the stability of the financial system as a whole. On the contrary, the existence of this phenomenon shows that the imbalance of China’s economic development has reached a very serious situation. In line with our understanding, the more intensive financial links, the more developed the financial system, and the stronger the role of supporting economic development in a region, and the overall network characteristics indicators and economic development indicators should show a positive proportional relationship, but in the empirical analysis we find there is an inverted state. The eastern region has a higher level of economic development and a faster speed of economic development, while some central and western regions have a lower level of economic development, but the speed of development is faster. Therefore, when estimating the overall network characteristics of China’s financial resources distribution, there is an inversion result that cuts off the contact path but increases the speed of economic development.

### Analysis of network effect of global network characteristics on economic development differences

Gini coefficient refers to the income gap between countries and regions, which is often used to measure the differences in economic development among regions. According to the division of Gini coefficient by the United Nations Development Program. The value of Gini coefficient lower than 0.2 indicates a high average; between 0.2 and 0.29 indicates a comparative average; between 0.3 and 0.39 indicates a relatively reasonable; between 0.4 and 0.59 indicates a large difference; and more than 0.6 indicates a large disparity. The average Gini coefficient of China in 2015, published by the National Bureau of Statistics, is 0.462, which belongs to the category with large differences.

From Table 8, we can see that:

1. The higher the network density of financial resources distribution, the lower the difference of economic development. With the increase of financial resource distribution paths among regions, the links between members of the whole network are closer and the gap between them is weakened. The degree of network correlation is inversely proportional to the index of economic development difference, which indicates that the more ways each member of the financial resource distribution network can connect through multiple paths, the more robust the whole network, the smaller the economic development difference among members. Barrier-free flow of financial resources among nodes is not only conducive to the more effective use of financial resources, but also of great significance to promote regional economic development. Drawing on the experience of the development of the Yangtze River Delta urban agglomeration in China, we can see that the financial markets in various regions of the Yangtze River Delta urban agglomeration have emerged, which are as follows: in the credit market, the cross-regional loan of commercial banks has developed rapidly; in the bill market, the discount and transfer business of bills is frequent; in the capital market, the Yangtze River Delta has established intermediaries with each other. In addition, in terms of infrastructure, industrial structure and supporting facilities, there are large-scale economic and financial business exchanges in all regions of the Yangtze River Delta.
network density and network correlation degree make the Yangtze River Delta urban agglomeration not only have a higher level of overall economic development, but also maintain a balanced development of regional economy. The problem of segmentation in China’s current market is more prominent. In addition to being divided into three major parts: the eastern region, the middle region and the western region, the western and the central provinces are also relatively low in network density and network connection due to the geographical environment and economic basis, which is also the reason for the large regional disparity in China.

2. The degree of network level is directly proportional to the index of economic development difference, which indicates that the more complex the level structure of financial resources distribution network is, the more dominant and subordinate status there is, the greater the difference of economic development. The areas dominated by financial resources often belong to the more developed areas of China’s economy. These areas play an important role in China’s economy. The formulation of China’s macroeconomic policy is more based on the economic status of the economically developed areas. This kind of financial policy ignores the economically underdeveloped areas. The actual situation often leads to more obvious differences between underdeveloped areas and economically developed areas. Developed countries such as the United States have implemented the statutory reserve ratio of member banks, which is formulated according to the size and the regional classification of banks, effectively alleviating the disparity of financial development in various regions. At present, China is trying to solve the problem of regional disparity. From the financial point of view, adopting different financial policies for different regions is conducive to alleviating the disparity of regional development.

In addition, it needs to be noted that although the network efficiency is not significant in the estimated results, to show the integrity of the results, we choose to retain the insignificant variable.

**Analysis of Individual Network Effects**

The network effect of the overall network characteristics can be analyzed from the overall level of the network, while the individual network characteristics measure the status of network members in the overall network. Therefore, the use of individual network characteristics can be more detailed to analysis network effects of the financial resources distribution network of provinces (municipalities, autonomous regions) on economic development. We use the degree of point centrality, betweenness centrality and closeness centrality of provinces (municipalities and autonomous regions) from 2000 to 2017 as indices of individual network characteristics, and GDP with natural logarithms as indicators of economic development. To avoid false regression and ensure the validity of the estimated results, we test the stability of each panel sequence. The test results are shown in Table 9.

In Table 10, the RE represents Hausman test should be analyzed by random effect, and the FE represents Hausman test should be analyzed by fixed effect. The test results show that the FE model should be used for analysis. Three indices of individual network characteristics are estimated respectively and the results are shown in Table 11.

1. Individual network characteristics have a positive impact on economic development. The degree of point centrality indicates whether the network members are in the central position in the network, and the degree of point centrality of the members in the central position is higher. In the distribution network of financial resources, provinces (municipalities, autonomous regions) with higher degree of point centrality concentrate more financial resources, which can be understood as financial centers. Rich financial resources provide support for the economic system, the financing problem of enterprise development is easier to be solved, and the transaction cost and information cost are relatively low, which is conducive to economic development.
Closeness centrality describes the sum of shortcut distances between a region and other regions in the whole network. It represents the ability not to be affected by other regions. The higher the closeness centrality, the less affected the region is by other regions. In the distribution network of financial resources, there are more links between provinces (cities, autonomous regions) with higher closeness centrality and other provinces, and they usually have higher degree of point centrality and betweenness centrality, such as Jiangsu, Guangdong. Financial resource-rich regions have many links with other regions. As they are usually in the leading position in the process of resource exchange and have strong control over resources, it is not easy to receive the influence of other regions. Provinces (municipalities, autonomous regions) with such characteristics interact more with the surrounding areas in the process of economic development, which can gather resources of the surrounding areas, form agglomeration effect and promote economic development.

Betweenness centrality measures the regional ability to control resources. The higher the degree of betweenness centrality, the stronger the ability to control resources. Financial and economic centers are easy to form in regions with higher betweenness centrality, because in the distribution network of financial resources, provinces (municipalities and autonomous regions) with higher betweenness centrality are more likely to appear in the shortest path of financial links between other regions and become “bridges” between other regions, so it is proposed that the region become a financial and economic center.

Robustness Test
This article conducts a robustness test to prove the reliability of the conclusion and considers the impacts of external shocks, such as 2003’s SARS outbreak. In the model, we add the dummy variable of time, setting 2003 as 0 and the other years as 1, which is represented by Year. The results are shown in Tables 12 to 14. According to the results, even if SARS occurred in China in 2003, the overall network characteristics of China’s financial resources distribution still have a negative network effect on the economic growth rate, while the individual network characteristics have a positive network effect on the economic growth rate, which is consistent with the conclusion of this article. The conclusion of this article is steady and has passed the robustness test.

Conclusions and Suggestions
Conclusions
This article uses the SNA to analyze the relationship data of financial resources distribution network in China’s provinces (municipalities, autonomous regions) from 2000 to 2017. And we describe the characteristics of the whole and individual network respectively, and study the influencing factors

| Table 10. Hausman Test Results. |
|----------------------------------|
| Model                           | (1)       | (2)       | (3)       |
|                                 | Stat.     | P value   | Stat.     | P value   | Stat.     | P value   |
| Degree of point centrality      | 12.669*** | 0         | —         | —         | —         | —         |
| Closeness centrality            | —         | —         | 65.056*** | 0         | —         | —         |
| Betweenness centrality          | —         | —         | —         | —         | 42.535*** | 0         |
| RE/FE                           | FE        | FE        | FE        | FE        | FE        | FE        |

Note. RE, FE represents the random effect, the fixed effect, respectively.

| Table 11. Estimation Results of Network Effects of Individual Network Characteristics on Economic Development. |
|---------------------------------------------------------------|
| Model                           | (1)       | (2)       | (3)       |
|                                 | Coefficient | P value   | Coefficient | P value   | Coefficient | P value   |
| Constant term                  | 8.814***    | 0         | −11.182*** | 0         | 9.383***    | 0         |
| Degree of point centrality      | 0.116***    | .005      | —         | —         | —         | —         |
| Closeness centrality            | —         | —         | 6.922***   | 0         | —         | —         |
| Betweenness centrality          | —         | —         | —         | —         | 0.222***   | 0         |
| R²                              | .992       | .778      | .830       |           |           |           |

Note. ***p < .01.
of the formation of spatial correlation network of provincial financial resources, and further explore the network effect of network characteristics on economic development. Main conclusions are as follows:

1. The overall network characteristics of financial resources distribution among provinces and cities in China are characterized by low density, high dependence, and poor stability. The network density is divided by 2007, showing a downward trend and then an upward trend. The number of network links decreases first and then increases, but the overall density is low, and the financial links between provinces (municipalities, autonomous regions) are relatively sparse. The network level decreases first and then rises and the overall network has certain hierarchical attributes. The financial resources in the provinces have asymmetric spillover effects, and the status in the network is not balanced. The network correlation and network efficiency both indicate that although the existing contact path of China’s financial resources are rich, but the existence of network level causes some regions to rely too much on key provinces (municipalities and autonomous regions)
as contact points, and the overall network stability of financial resources distribution is poor.

2. Provinces and municipalities in eastern China have high degree of point centrality, betweenness centrality, and closeness centrality, and the distribution of financial resources among regions is quite different. In the individual network of financial resources distribution in China’s provinces and cities, Guangdong, Shanghai, Jiangsu, Zhejiang, and other eastern coastal cities also have a high degree of point centrality, betweenness centrality, and closeness centrality. They are in the central position in the financial resources distribution network and have a strong control over financial resources and are not easy to be subjected to other provinces. The control ability of the eastern region to the distribution of financial resources is higher than that of the central and western regions, and the financial resources are mainly concentrated in the eastern region. The distribution network of China’s financial resources is divided into four main income segments, that is, while the internal members of the plate have more relationships, the external members receive more relationships and less spillover effects on other sectors.

3. The spatial network structure of financial resources distribution is related to the level of economic development, globalization, marketization, and integration. Among them, the level of integration and marketization have a greater positive impact on the distribution of financial resources. The level of marketization has a positive impact on the distribution of financial resources. Improving the level of marketization is conducive to the accumulation of financial resources and the stability of the market. The level of integration has a greater impact on the distribution of financial resources, and financial resources between provinces with adjacent administrative boundaries are easier to flow across provinces.

4. Increasing the number of related paths of financial resources distribution and strengthening financial links among provinces (municipalities and autonomous regions) will help to improve the stability of financial resources network and thus help to reduce the imbalance of economic development among regions.

**Policy Implications**

To enhance financial links between provinces and cities, improve the stability of the financial system, and promote the coordinated development of finance and economy. In view of the research findings about the problems of China’s financial resources distribution and economic development, the following suggestions are put forward:

1. Strengthening financial support for the central and western regions, playing the role of the financial market dominated by the securities industry and the banking industry, and promoting the coordinated development of the eastern, central, and western regions to enhance the stability of the distribution of financial resources. The financial support of the city (autonomous region) will play the role of the financial market dominated by the securities industry and the banking industry to establish more financial links in different economic zones.

2. Promoting the level of marketization and using geographic advantages to promote regional financial development. Reducing intervention and providing space and policy support for economic activities by local governments can promote the level of marketization. The level of integration has a greater impact on the distribution network of financial resources, that is, the provinces with closer geographical distance and adjacent administrative boundaries are more likely to have an impact, strengthen cooperation with the surrounding provinces, and make use of geographical advantages to promote regional financial development.

3. We should plan regional financial development policies as a whole and pay attention to the impact of the overall financial resources structure on economic development. China should regulate and control at the macro level, make overall planning for the financial development policies of all provinces (cities and autonomous regions). While developing the finance and economy of the eastern region, China should focus on strengthening policy support for the central and Western regions, so as to improve the overall financial network structure, give full play to the network effect and reduce the regional economic development gap.

**Limitations and Future Scope of Research**

We use SNA methods to describe the relationship network formed by the spatial correlation of provincial financial resources and further explore the network effects of network characteristics on economic development with econometric methods. Although the influence of the overall network characteristics and individual network characteristics of provincial financial resources on economic development is analyzed, the specific influence path cannot be answered. Scholars can further explore specific transmission path of the network effect of the financial resource spatial correlation network on economic development, to obtain a deeper understanding of the spatial network structure of provincial financial resources.

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