AN EMPIRICAL EVALUATION OF THE COMPETITIVENESS OF THE FINANCIAL SERVICES INDUSTRIAL CLUSTER

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Abstract: The paper mainly intends to establish an evaluation index system of the competitiveness of the industrial cluster of financial services and an empirical study of the competitiveness of the financial services industrial cluster of the provinces (cities) within the three domestic economic rings. On the basis of comparing the differences of the competitiveness of the financial services industrial cluster of the three economic rings, strategies and suggestions about the further improvement of the competitiveness of the financial services industrial cluster of the three domestic economic rings are formed.

1   PREFACE

The practice of reform and opening-up proves that the prompt development of Chinese economy is up to the driving of some core areas with economic vitality. For example, the Pearl River Delta Region having Shenzhen and Guangdong as its core was the powerful engine of the Chinese economy during the 80s and the middle 90s. Till the middle and late 90s, the Yangtze River Delta Region, having Shanghai as its core, have begun to promote the economic development of Chinese economy. Now the Circum-Bohai Economic Ring has become the third growth pole following the Pearl River Delta Region and Yangtze River Delta Region and attracted wide domestic and overseas attention. The co-existence of competition and co-ordination between the three economic rings and cities within the rings has surfaced and the competitiveness of the provinces and cities have become the determinants of the social development, economic growth and competitive situation of the regions. As an important environmental factor of the competitiveness of provinces, cities, regions, even nations, financial competitiveness determines the competency and efficiency of the allocation of

financial resources of various layers. With the quickening of financial opening-up and degree of market in finance, the part of the financial services industrial cluster plays in increasing the competitiveness of the enterprises, regions and nations will be more outstanding.

This paper intends to make a quantitative measurement of and comparison between the competitiveness of the financial services industrial cluster of the three economic rings of China and provinces and cities within the economic rings, understand the relative status and differences between the competitiveness of the financial services industrial cluster of the provinces and cities within the rings, and the general situation of development of the three economic rings, and provides referential basis for the sensible allotment of regional financial resources, orderly flow and relevant organs' scientific decision-making.

2 THE BASIC FRAMEWORK OF THE EVALUATION INDEX SYSTEM OF THE COMPETITIVENESS OF THE FINANCIAL SERVICES INDUSTRIAL CLUSTER

Chinese and foreign scholars have different analyses on the source of the competitive advantages of the financial services industrial cluster in that these analyses have different emphases of factors to consider and have respective characteristics, advantages and weak points. Because it is hard to give scientific and reasonable evaluation to the financial services industrial cluster, Index System, although widely, is not yet established.

On the basis of close relating to the reality of the development of the industrial clusters of Chinese financial services, this paper consults the current evaluation index systems and evaluation models of the industrial clusters, takes into account the characteristics of the financial services industrial cluster, classifies them according to natures of various factors, and believes that the evaluation of competitiveness of the financial services industrial cluster can be considered from three aspects:

Scale competitiveness of the financial services industrial cluster: is the apparent index, and is also the most important indicator to measure the might of the financial services industrial cluster.

Developmental competitiveness of the financial services industrial cluster: is the efficiency index of development of the financial services industrial cluster and represents the depth and width of the development of the financial services industrial cluster.

The environmental competitiveness and the external environmental factors of financial services: have the most important influence on the competitiveness of the industrial cluster.

The final thing is the selection of indexes. This paper has introduced 20 index variants to reflect the competitiveness of industrial clusters of financial services. Please refer to Table 1 for specific index system.

3 THE MEASUREMENT AND COMPARISON BETWEEN THE COMPETITIVENESS OF THE FINANCIAL SERVICES INDUSTRIAL CLUSTER OF THREE ECONOMIC RINGS

3.1 Choosing of Samples and Index Data

According to the aforementioned evaluation index, this paper evaluates the competitiveness of the financial services industrial cluster of the twenty cities and provinces within the three domestic economic rings. Among them, the geographical scope of Circum-bohai Economic Ring contains five provinces and two cities (Beijing, Tianjin, Hebei, Liaoning, Shandong, Shanxi, and Inner Mongolia), the Pan-Yangtze River Delta Region covers four

Table 1: Evaluation index system of the competitiveness of the financial services industrial cluster.

Categories of Index	Items of Index
Scale Competitiveness (X1)	Personnel of financial services (X11), Number of legal persons of financial institutions (X12), Deposits at the end of a year (X13), Loans at the end of a year (X14), Percentage of deposits (X15), Percentage of Loans (X16), Deposit Balance (X17), Fiscal Budget Expenditures (X18), Income of Insurance Fees (X19)
Developmental Competitiveness (X2)	Financial Output Value (X21), Proportion of deposits to loans (X22), Deposit Amount Per Capita for financial institutions (X23), Loan Amount per Capita for financial institutions (X24), Financial co-relational factors (X25), Securitization Rate of Capital (X26)
Environmental Competitiveness (X3)	Regional General Product (X31), Formation of Capital (X32), Investment Amount of Fixed Assets (X33), Final Consumption (X34), Really Used Foreign Capital (X35)

provinces and one city (Shanghai, Jiangsu, Zhejiang, Anhui, and Jiangxi), Pan-Pearl River Delta Region used to cover the scope of nine provinces and two districts including Jiangxi, and the two special administrative regions of Hong Kong and Macau according to original "Framework Agreement of the Regional Co-operation of Pan-Pearl River Delta Zone". In view of the fact that Jiangxi province has been included in the developmental framework of Pan-Yangtze River Delta Region and the big differences between the two special administrative regions of Hong Kong and Macau, and the mainland provinces, the Pan-Pearl River Delta Region chooses eight provinces and autonomous regions of Fujian, Hunan, Guangdong, Guangxi, Hainan, Sichuan, Guizhou, and Yunnan as research objects. The data come from the statistical almanacs of the provinces, Chinese Financial almanacs, statistical almanacs of Stock Exchanges, Annual reports of Securities supervisory Committee and Banking Supervisory Committee. Some data is from various relevant websites of financial institutions and financial regulatory organs. All the data was through calculation and arrangement, and the time of data is December 29th, 2009.

3.2 The Empirical Analysis on the Competitiveness of Financial Industries for Three Economic Rings

3.2.1 The Process of Empirical Analysis

In this paper, we use principal component and factor analysis to evaluate the competitiveness of financial industries for different cities. According to the requirements of factor analysis, we construct an evaluation matrix: using the indicated variables and data of 20 provinces (regions) to establish an evaluation matrix with 20 rows and 20 columns, and then analyze the correlation matrix of variables to validate the significance of factor analysis. Considering the different variable units and extremely large variances for some variables, in order to avoid undue influence on the factor loadings, we apply non-dimensional treatment to the raw data, that is, we standardize the raw data and get Z scores. After the transformation, the mean value is zero and the standard deviation is 1 (the data and process omitted).

With SPSS software, we used a quartimax method to rotate the data 25 times, so that the elements in each column of the component matrix can be polarized enough to explain the practical

meaning of the common factors. The number of extracted factors depends on the common factors' variance, to the original variables. With a greater variance contribution, the common factor can portray the study area's characteristics with a higher level of clarity. When the eigenvalues of several important factors are greater than 1, and their cumulative variance contribution rate reaches or exceeds 85%, these factors can represent the original variables to reflect the overall characteristics of the study area. By solving the characteristic equation of the correlation matrix, we obtained 20 unit eigenvectors. The results showed that three components could be selected as the principle components for further analysis. After orthogonal rotation, the eigenvalues and variance of the three principle components are shown in Table 2.

Table 2: Total variance explained after rotation.

Component	Eigenvalue	% of variance	Cumulative %
F1	5.859	39.057	39.057
F2	5.857	39.044	78.101
F3	2.784	17.504	95.605

3.2.2 The Explanation of Principle Components

According to the rotated component matrix and component score coefficient matrix, we can analyze and explain the three principal components. Principal component 1 has a larger loading in the variables of year-end balance of deposits, year-end loan balance, premium income, savings balance, percentage of deposits, percentage of loans, budget expenditures, regional GDP, fixed asset investment, the number of financial institutions, and the number of financial practitioners. The variables of the component represent the overall size and development level of economy and financial industry, so component 1 can be regarded as the scale component of the financial industry's development. Its contribution rate is 39.057%. Component 2 has a larger loading in the variables of financial industry output, per capita deposits for financial officers, per capital loans for financial officers, deposit-loan ratio, final consumption, financial interrelation ratio, and capital securitization ratio. The variables mainly reflect the depth and breadth of financial industry's development, so the component can be regarded as the efficiency component of financial industry. Its contribution rate is 39.044%. Component 3 has a larger loading in the variables of actual foreign investment and capital

Table 3: Competitiveness rankings of financial industry.

Region	F1	F2	F3	F	Ranking
Shanghai	2.56872	1.18506	1.52383	1.88867	1
Beijing	0.75469	2.26458	1.11495	1.43727	2
Shenzhen	1.05803	1.22925	1.90641	1.28328	3
Guangdong	1.17032	0.85762	0.80739	0.98245	4
Zhejiang	1.04885	1.07945	0.07185	0.88247	5
Jiangsu	1.11583	0.78663	-0.10131	0.75855	6
Tianjin	0.89594	0.27343	-0.47115	0.39142	7
Liaoning	0.37916	-0.00756	-0.25952	0.10429	8
Shandong	0.10938	-0.16659	-0.28557	-0.07563	9
Fujian	-0.08294	0.10204	-0.05263	-0.17657	10
Sichuan	-0.26171	-0.32813	-0.19326	-0.27630	11
Hebei	-0.36543	-0.35482	-0.26224	-0.34220	12
Anhui	-0.29976	-0.58798	-0.43536	-0.44229	13
Inner Mongolia	-0.55198	-0.47183	-0.39877	-0.49120	14
Shanxi	-0.30064	-0.75948	-0.50119	-0.52474	15
Yunnan	-0.47501	-0.69985	-0.71032	-0.60991	16
Jiangxi	-0.49673	-0.70131	-0.68865	-0.61542	17
Hainan	-0.80162	-0.68823	-0.34326	-0.67139	18
Guangxi	-0.73296	-0.78345	-0.50951	-0.71267	19
Guizhou	-0.74587	-0.95174	-0.74969	-0.83064	20

Table 4: The clustering of financial competitiveness.

First grade	Second grade	Third grade	Fourth grade
Shanghai, Beijing, Shenzhen	Guangdong, Zhejiang, Jiangsu, Tianjin, Liaoning	Shandong, Fujian, Sichuan, Hebei, Anhui, Inner Mongolia	Shanxi, Yunnan, Jiangxi, Hainan, Guangxi, Guizhou

formation. It mainly reflects export-oriented economy's influence on the competitiveness of financial industry, so the component can be seen as the outward component. Its contribution rate is 17.504%.

3.2.3 Component Scores and Ranking

We used regression to get the three component scores F1, F2, F3, and then compute the weighted comprehensive component score with the variance contribution rate as the weight, that is, F = (F1 * 39.057 + F2 * 39.044 + F3 * 17.504)/95.605. The comprehensive score shows the competitiveness of respective provinces (regions) in three economic circles of our country and we can rank them (see Table 3).

3.2.4 Clustering of the Provinces (Regions)

Based on the preceding component analysis, we get clustering variables through multiplying the sample provinces' component score by their respective contribution rate, and then we use clustering analysis

to divide up the provinces according to their competitiveness in financial industry. After clustering, we divide the provinces with different competitiveness in financial industry into four categories (see Table 4).

3.3 Analysis of the Results

The comprehensive ranking and clustering results reflect the developmental differences between the financial services industrial cluster of the three domestic economic rings. It can be clearly found out from the table that the competitiveness of the financial services industrial cluster of Shanghai, Beijing, and Shenzhen is mighty and plays a leading role respectively in the Pan-Yangtze River Delta Region having Shanghai as its centre, Circum-bohai Economic Ring having Beijing as its centre, and Pan-Pearl River Delta Region having Shenzhen as its centre. Within the three economic rings, Pan-Yangtze River Delta Region ranks No. 1 with a powerful comprehensive competitiveness of the financial services industrial cluster, and circum-Bohai Economic Ring ranks No. 2 with an obvious

increase of competitiveness, while Pan-Pearl River Delta Region has a relatively weaker competitiveness of the financial services industrial cluster. From the perspective of comprehensive ranking, the ranking of Shanghai as No.1, Beijing as No.2, and Shenzhen as No.3 corresponds with our qualitative analysis of the development of economy and finance of the three cities. From the perspective of specific data, the comprehensive score of Shanghai, Beijing, Shenzhen, Guangdong, Zhejiang, Jiangsu, Tianjin, and Liaoning are above zero, which indicates that their performance level is above the average level within the three economic rings. All the other provinces, whose comprehensive score are below zero, fail to reach the average performance level. Hence the big differences of the competitiveness of the financial services industrial cluster between the big three economic rings and cities within the provinces. Seen from the leading role of the development of the financial services industrial cluster played by Shanghai as the core of the regional development of the Pan-Yangtze River Delta Region, Shanghai is unique in both the developmental scale of the financial services industrial cluster and depth and width of development of the financial services industrial cluster, in that it has a balanced development of banking, securities and insurance, forms a relatively complete market financial system, is the centre of the national financial market, hosts a large number of foreign-funded financial institutions, and has a leading degree of financial opening-up in China. Seen from the perspective of the developmental effect of the financial services industrial cluster of the central cities of the three economic rings, Beijing and Tianjin have obvious advantages. Being the capital, Beijing is the location of many headquarters of domestic financial institutions and regional headquarters of international financial institutions so it has an exclusive advantage of financial competitiveness of headquarters, which is also able to connect ideally with the advantages of powerful international trade and shipping of Tianjin. All that cannot be emulated by cities and provinces of other economic rings and is the reason why the development of the industrial cluster of financial services of Circum-Bohai Economic Ring can surpass its previous leaders. Seen from the perspective of the degree of opening-up of the development of the industrial cluster of financial services of the central cities of the three economic rings, Shenzhen, as the earliest special economic zone of China, plays the important part of the testing field of reform and opening-up and enjoys a high opening-up level of economic and a relatively high degree of co-operation between Hong Kong, Shenzhen and Macau because of its vicinity with the two special administrative zones.

4 CONCLUSIONS AND SUGGESTIONS

Empirical studies indicate that extremely close relationship exists between the competitiveness of the industrial clusters of regional financial services and comprehensive regional competitiveness, especially the economic developmental levels. Gradient differences of modes of economic development, developmental levels, clustering abilities of the financial services industrial cluster, radioactive abilities, spillover effects, financial market system, financial organization system, and degree of financial opening-up exist between the three economic rings. Different judiciary environments and social credit environments cause big differences between rings, which generates the gradient circumstance of the competitiveness of the financial services industrial cluster among the three economic rings and provinces and cities within the rings. That has been proved by the competitiveness rankings and clustering results of the competitiveness of the financial services industrial cluster within the three economic rings and the clustering results, which basically corresponds with the regional differences of the economic development in reality. Thus it can be illustrated that the competitiveness evaluation index of the financial services industrial cluster chosen by this paper closely relates to the fact of development of regional finance. And on the basis of this evaluation, the reasons of the differences of regional financial development are found and suggestions and strategies to improve the competitiveness of the financial services industrial cluster are provided.

As for the Pan-Yangtze River Delta Region having Shanghai as its centre, the source and improvement of the competitiveness of the industrial clusters of regional financial services depends on the strong demand for funds and financial services in the developmental process of regional economy, which is the basis of improving the competitiveness of the industrial clusters of regional financial services. Simultaneously, the impetus of policy is also an important factor of development of the industrial cluster of financial services of the Pan-Yangtze River Delta Region. Finally, on one hand, organizational system of financial institutions of the

provinces and cities within the region shall be continuously optimized; on the other hand, efforts made by the financial institutions themselves of the provinces and cities within the region shall also be strengthened. As for the Circum-bohai economic ring having Beijing and Tianjin as its center, the main idea to improve the competitiveness of the financial services industrial cluster shall be the continuous expansion of financial opening-up and institutional innovation, the generation of market environment to construct the financial services industrial cluster, the promotion of innovation of financial instruments and financial services, further formation of the system of financial organization with apparent clustering effect and the financial market system involving currency market, credit market, security market, insurance market promoting each other, and the exertion of core effects of the financial services industrial cluster in the functions of regional development. As for the Pan-Pearl River Delta Region having Shenzhen and Guangdong as its centre, improving the competitiveness of the financial services industrial cluster takes optimizing regional economic environment, creating conditions for the co-ordination and development of economy and finance and forming source and basis for the competitiveness of the industrial cluster of financial services of the provinces and cities within the region through increasing the attraction toward financial institutions, high quality labor resources and infrastructure, and sensible and sound regulatory environment.

The comparative study of the competitiveness of the financial services industrial cluster of the three economic rings extends a powerful foundation for the central bank to stipulate differentiated regional financial and currency policies: The central bank may stipulate differentiated indexes of economic development to reflect the degree of market, degree of currency, and degree of integration that indicates economic development of different regions, and marginal profit rate of the funds and indexes of returning loans to reflect the abilities of input and output of funds of different regions to promote the cross-region flow and operation of funds and financial institutions, break the regional barriers of financial resources, mend the segmented situation of regional financial resources, promote the formation of the spatial flow and mechanism of allocation of financial resources to increase the competitive level of the financial services industrial cluster of the region as a whole.

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