Research on Promotion Paths of China's Financial Efficiency Based on DEA Model

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Abstract: To a large extent, the allocation of financial resources determines the way and speed of economic development. Financial efficiency is an important reflection of the allocation of financial resources. In this paper, thirty provinces in China were selected to analyze the efficiency of Chinese financial industry based on BCC model of DEA. The results show that PTE is relatively high and SE is low. It is required to maintain PTE and enhance SE by the means of the financial product innovation and the expansion of financing channels.

1. Introduction

Since reform and opening, China's economy has made remarkable achievements. With the rapid development of the real economy, the status of finance in the national economy is becoming increasingly prominent, which objectively requires that the financial development should be changed from scale expansion to efficiency improvement. The central economic work conference proposed deepening financial reform, improving financial efficiency and promoting economic development. A modern financial system that can effectively allocate financial resources plays a vital role in supporting the long-term growth of the real economy. Improving financial efficiency has a significant effect on China's technological progress, productivity improvement, economic structure improvement and even export growth. The financial industry is the key hub of economic operation, and the financial industry of the countries in transition plays a very important role in promoting the economy. The financial efficiency determines the speed of financial growth is the key to promoting economic development. The improvement of financial efficiency can effectively and fully mobilize all kinds of resources and rationally allocate them to promote economic development, economic development will stimulate the growth of financial demand, the development of the financial industry will be promoted, and eventually the financial industry and regional economy will form a mutually reinforcing benign cycle process. While improving regional financial efficiency, we must also attach importance to the balance of regional financial efficiency. Excessive regional differences in efficiency will cause certain obstacles to China's macro-control. The implementation of macro-economic policies may fail in the face of serious financial imbalances between regions, and will also lead to an increase in the gap between the rich and the poor. Big. This paper not only selects the relative numerical data of all indicators, but also compares the different efficiency of different provinces and regions to make a comprehensive, in the selection of indicators and research objects, comparative studies and other aspects have made corresponding improvements. This paper makes a comprehensive analysis of the degree and source of regional financial disparity from three aspects: comprehensive efficiency, pure technical efficiency and scale efficiency. Based on the different requirements of financial efficiency and input-output, this paper proposes some policy recommendations for different types of cities, hoping to provide technical support for the government to formulate the coordinated development policies of regional finance.

2. Research Method

Data envelopment analysis (DEA) is a method of efficiency evaluation of multiple

decision-making units with multiple inputs and outputs. It was founded in 1978 by Charnes and Cooper. It can be widely used in performance evaluation. The DEA method belongs to the category of operations research. It mainly processes the data obtained by mathematical programming to evaluate the production effectiveness of decision-making units (DMUs) or to deal with other multi-objective decision problems. DEA method is mainly to keep the input and output indexes of DMU unchanged, projecting DMU to the front surface by mathematical programming method, and measuring the relative effectiveness of DMU by measuring the degree of deviation from the front surface. DEA method is a non-parametric method. It does not need to estimate the parameters in the efficiency frontier function, and does not need to consider the dimension factors. It has great advantages in dealing with multi-input and multi-output problems, and becomes a common method to measure various kinds of efficiency. We do not need to pre-estimate parameters, any weight assumptions, to avoid subjective factors, the results are more objective. Therefore, this paper uses DEA evaluation method to measure the efficiency of China's financial resources allocation. The above CCR model assumes that the size reward of the decision-making unit remains unchanged, that is, the size of the decision-making unit does not affect its efficiency. In fact, changes in scale can lead to changes in the efficiency of decision-making units. Increasing input may not necessarily increase the proportion of output. This scale of production efficiency is called scale efficiency. Compared with CCR model, BCC model can more fully reflect the current efficiency situation in China. The situation. Therefore, this paper chooses the BCC model with variable returns to measure the financial efficiency.

3. Empirical Research of Financial Efficiency Based on DEA

3.1 Index System.

The financial industry is a complex system with multiple inputs and multiple outputs. Deposits are the main source of operating funds for financial institutions. The size of regional deposits can reflect the capital absorption capacity of local financial institutions and the loan size of financial institutions, thus reflecting the financial impact on the local economy to a certain extent. As the human and intellectual resources of financial institutions, employees will undoubtedly affect the operational efficiency of institutions. Many studies have used the absolute number of employees when adding this index, but this is unscientific because it does not consider the size of the population in each region. In this paper, the ratio of the number of employees to the total population of the region is used as the second input index. This paper chooses the ratio of the total deposits and loans to the regional population to represent the per capita financial resources as the first output index. This paper selects the growth rate of the financial value added as the second output indicators. Financial institutions have an important impact on the development of regional economy, and their financial efficiency is bound to have an impact on the regional economy. The ratio of the added value of the financial sector to the regional GDP reflects the contribution rate of the financial industry to the overall economy, which directly reflects the financial support to the regional economy. This paper selects the proportion of financial industry added value in each area to account for GDP in the region as the third output indicators.

3.2 Operation Results.

We use the BCC model to get the result of operation.

Table 1. Financial efficiency of all provinces in China

Province	TE	PTE	SE	SR
Anhui	0.612	0.744	0.822	drs
Beijing	1	1	1	-
Fujian	0.698	0.769	0.908	irs
Gansu	0.77	0.899	0.856	irs
Guangdong	0.982	1	0.982	irs
Guangxi	0.826	0.887	0.92	irs
Guizhou	0.706	0.789	0.895	irs
Hainan	0.879	0.883	0.996	irs
Hebei	0.752	1	0.752	irs
Henan	0.835	0.969	0.862	irs
Heilongjiang	0.669	0.912	0.734	irs
Hubei	0.742	0.855	0.868	drs
Hunan	0.733	0.812	0.903	drs
Jilin	0.862	0.992	0.869	irs
Jiangsu	0.678	0.784	0.865	irs
Jiangxi	0.739	0.859	0.86	irs
Liaoning	0.808	0.949	0.852	irs
Inner Mongolia	0.708	0.744	0.951	drs
Ningxia	0.656	0.774	0.848	irs
Qinghai	0.817	0.972	0.841	irs
Shandong	0.504	0.645	0.781	irs
Shanxi	0.862	1	0.862	irs
Shaanxi	0.772	0.819	0.943	drs
Shanghai	1	1	1	-
Sichuan	0.796	0.889	0.895	irs
Tianjing	0.817	0.821	0.895	drs
Tibet	0.799	0.899	0.889	drs
Xinjiang	0.787	0.796	0.989	drs
Yunnan	0.982	1	0.982	irs
Zhejiang	1	1	1	-

3.3 Results Analysis.

There are 30 provinces and municipalities directly under the central government in the mainland of China. The comprehensive efficiency (also called technology efficiency) of Beijing, Shanghai and Zhejiang has reached a peak of 1. The minimum value is only 0.504; the maximum value is 1; the average value is 0.793. The low technical efficiency of finance is mainly caused by two aspects: pure technical efficiency and scale efficiency.

In terms of pure technical efficiency, there are both maximum value 1 and minimum value 0.645. Generally speaking, the pure technical efficiencies of China's provinces are at a relatively high level, with an average value of 0.882.

From the perspective of scale efficiency, except Beijing, Shanghai and Zhejiang, the other provinces are below 1. Especially, the scale efficiencies of Hebei, Heilongjiang and Shanxi are below 0.8. From the perspective of scale income, except for Anhui, Inner Mongolia and Shaanxi provinces, scale income has been in the growth stage. The scale efficiency has not reached the frontier level, and the scale effect also shows an increasing trend, so it is particularly important to expand the size of the financial market.

4. Promotion Paths of China's Financial Efficiency

In view of the serious differentiation of China's financial efficiency, the state should also consider the rational allocation of resources when formulating policies. From the data results, we can see that the eastern and southern coastal areas are long-term relatively stable financial institutions of higher

learning areas. The efficiency of financial allocation in different regions is quite different. By comparing and ranking the efficiency of financial allocation in different parts of China, we find that there are still great differences in the efficiency of financial allocation in different parts of China. The inefficiency of resource allocation in some areas has been low, which may be due to the existence of different levels of input redundancy and output shortage in these areas. Therefore, China should further improve the efficiency of China's financial allocation from the following aspects. If the country continues to concentrate resources on these regions, it will continue to aggravate China's financial disparities. Therefore, in the future financial reform, the state should provide preferential policies and invest more resources in the central and western regions where the financial efficiency is relatively weak. It will not only make full use of financial resources, but also reduce the serious financial disparity.

Many provinces in our country have sufficient or excessive input, but the technical level is limited or the degree of attention is not enough. Therefore, the state should encourage and guide the innovation of financial products, financial instruments and financial services, expand the financial coverage, and as far as possible improve the level of financial services. Specifically speaking, it is necessary to intensify innovation in terms of gold products, services and channels, to meet the multi-level financial needs, and to be a strong backing for development. We should pay attention to the introduction of financial talents and advanced technology, especially the introduction of innovative talents. In addition, we should also pay attention to the training of local financial innovative talents, including investment support to relevant colleges and universities, vigorous construction of related disciplines, especially the combination of finance and other disciplines. Each province should start from its own initiative to strengthen the construction of innovative finance, such as the innovation of financial products. As people in different developed areas have different acceptability to different financial products, the financial innovation should also meet the local market.

Insufficient investment and redundant investment will lead to low efficiency of financial allocation. If the input exceeds a certain range, the excessive input will not promote the efficiency of financial allocation, on the contrary, such as waste of resources or improper use of resources. Therefore, local financial departments should selectively increase or reduce their input in order to ensure the rational and efficient use of financial input in accordance with the actual situation of the region's finance. The expansion of financing channels, the richness of financial products, financial services in line with market demand can attract more customers, rational allocation and full use of resources will contribute to the expansion of the market scale. The scale effect reflects that most provinces are increasing in scale, and the scale of operation should be expanded. This paper argues that it is very important to strengthen the construction of the capital market. For enterprises directly financing, the state can encourage financing through the securities market in the form of tax incentives or subsidies.

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