The research of China's industrial finance based on input-output technology

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Abstract: In the process of researching China's industrial finance by input-output technology, on one hand, it is necessary to construct an intermediate input ratio factor and intermediate using distribution factor to study the preconditions for the normal operation of China’s industry; One the other hand, it is necessary to construct a growth state attribution matrix and to accurately judge the direction of the influence of finance and industry in the development process. And on this basis, the analysis and the research on the status quo of China's industrial finance development are carried out.

1. Introduction
Industrial finance is mainly reflected in the purpose of financial support for industrial development and industrial promotion of financial development. Among them, finance can provide a good blood for the industry, and the industry can promote the further development of finance. The organic integration of the two can also promote the further development of the national economy. However, China's industrial finance is still in its infancy, and it is necessary to fully consider the technical conditions and influencing conditions of the good integration of the two. On this basis, the analysis of the status quo of China's industrial finance will be carried on.

2. Theoretical model
2.1 technical basis
Analyzing whether the Chinese industry can analyze the technical conditions is also an analysis of the industrial interaction effect of the financial sector. The indicators commonly used are mainly the influence coefficient and the sensitivity coefficient, but the weighting problem has not been fully considered in the specific calculation process. In theory, the pulling effect of a certain department on the national economy is not only related to its influence, but also has a certain correlation with the composition ratio of the final industry of the national economy, which requires to grant the corresponding weights to each department, and on this basis, to rationally construct the weighted influence coefficient and the sensitivity coefficient.

The influence coefficient indicates the extent to which a department depends on other departments. In the process of specific calculation, the numerator mainly indicates the extent to which a department affects the national economy as a whole, and it has certain practical significance. The denominator is mainly expressed as the average influence of the final product in the national economy, and is calculated by the arithmetic average model. However, there are still shortcomings in the calculation model which is that it is not economically clear and it fails to fully take the final product structure of the department into account. Taking the proportion of the final product of the department in the final product of the national economy as the weight, and on this basis calculating the influence coefficient.
reasonably can effectively reflect the actual level. So is the weighted sensitivity coefficient in its calculation process. Based on the considerations of the weight, the existing influence coefficient and the liver hardness coefficient are transformed. On this basis, the demand pulling effect of the financial sector on other sectors and the supply push effect are calculated reasonably. The formula is as follows.

\[ u_j' = \frac{\sum b_{ij} / \sum \left( \sum b_{ij} \right) \bar{\varphi}_j}{\sum Y_j} \]

\[ \bar{\varphi}_j = \frac{Y_j}{\sum Y_j} \]

\[ \omega_i' = \frac{\sum \tilde{b}_{ij} / \sum \left( \sum \tilde{b}_{ij} \bar{\varphi}_j \right)}{\sum} \]

From the perspective of demand, it is found that the j department adds one unit to the total consumption of the i department after the final use. A is expressed as the direct consumption coefficient matrix, I is expressed as the unit matrix, and Yj is the final product quantity of the j department. \( \sum Y_j \) is expressed as the total amount of final products in the national economy. In this formula, the denominator can directly reflect the influence of a final product of the national economy on the overall economy, and the influence coefficient and the coefficient of induction have a certain difference before and after the weighting, which can effectively reduce the influence of centering the proportion.

2.2 Impact basis

The direction of influence of finance and industry in the development of process also directly determines whether the industry finance can proceed smoothly. On the basis of the correlation effect between finance and industry, four kinds of integration can also be formed, as shown in Table 1.

| Happening | The influence direction of finance and industry | Integration of the two |
|-----------|-----------------------------------------------|-----------------------|
| 1         | Finance constraints industry and industry promotion finance | Industry development is constrained |
| 2         | Finance and industry restrict each other       | Restricted by each other, difficult to develop |
| 3         | Finance promotes industry to play a role and industry restricts financial development | Industrial restraint is constrained |
| 4         | Finance and industry promote each other's development | The two promote each other and develop together |

By analyzing Table 1, it can be seen that the fourth situation is an inevitable condition for the smooth integration of industrial finance, which requires constructing a growth state attribution matrix that can judge the direction of influence between finance and industry, so that from the perspective of final demand, it can reflect the influence of a sector on other industries in the process of its development. In the growth matrix of the financial sector, C is defined as the growth state attribution
matrix, and $O_0$ as well as $O_t$ is respectively used as the matrix and its reporting period normalization matrix, which can be obtained:

$$O_i = IO_0 + CO_0$$  \hspace{1cm} (4)$$

$$C = (O_i - O_0)O_0^{-1} = (O_i - O_0)O^*/|O_0|$$  \hspace{1cm} (5)$$

$$c_{ij} = \sum (o_{i0}^*-o_{i0}^0)E_{ij}/|O_0|$$  \hspace{1cm} (6)$$

Compare the number of the matrix elements $C_{ij}$ and 0 in the growth state matrix, and then judge the influence of the j department on i department’s structural structure from the perspective of the final demand. When $C_{ij}$ is more than 0, it indicates that the final demand of the j department can drive the structural growth of the i part, and vice versa, it indicates that the final demand of the j department will restrict the structural development of the i department. In the process of judging the direction of influence between various departments, it is also possible to make a simple evaluation of the development competitiveness of different departments [1].

3. The case analysis

In this study, we mainly conducted an in-depth analysis of the technical basis and impact basis of China's industrial finance in terms of the three-year input-output tables in the year of 2002, 2005 and 2007. The specific comparative analysis indicators include the interaction of China's financial sector and national economic industry and the extent of the impact of the batch. The specific results are shown in Table 2.

| Number | (1) Mean | (2) Mean | (3) Mean | (4) Mean |
|--------|----------|----------|----------|----------|
| 02 | 05 | 07 | 02 | 05 | 07 | 02 | 05 | 07 | 02 | 05 | 07 | 02 | 05 | 07 |
| 3 | 20.3 | 19.2 | 17.3 | 18.9 | 1 | 2 | 1 | 2 | 8+ | 7+ | 25.1 | 20.3 | 37.3 | 28.8 | 1 | 1 | 1 | 1 | 6+ | 6- |
| 4 | 3.0 | 7.5 | 3 | 3.7 | 9 | 6 | 8 | 9- | 6+ | 6.0 | 3.6 | 3.0 | 8.2 | 4.5 | 9 | 9 | 1 | 6 | 3+ | 10- |
| 5 | 4.2 | 10.2 | 0.4 | 1.1 | 3.8 | 1 | 4 | 2 | 5 | 12+ | 12+ | 3.7 | 7.0 | 3.8 | 1.2 | 1 | 9 | 8 | 6 | 7 | 5- | 3- |
| 6 | 6.4 | 7.1 | 5.6 | 5.6 | 7 | 7 | 7 | 11+ | 4- | 11.0 | 6.6 | 7.0 | 3.8 | 9.5 | 3 | 6 | 2 | 3 | 5+ | 4- |
| 8 | 12.1 | 7.0 | 1.2 | 8.1 | 5.8 | 3 | 9 | 6 | 6 | 10+ | 10+ | 7.2 | 12.1 | 7.2 | 12.1 | 1 | 5 | 15 | 5 | 10 | 2+ | 1+ |
| 9 | 2.1 | 1.1 | 2.7 | 1.4 | 3 | 11 | 12 | 10 | 13+ | 7+ | 15.6 | 2.1 | 7.3 | 6.3 | 2 | 10 | 5 | 5 | 4- | 8- |
| 10 | 8.6 | 6.7 | 4.3 | 14.3 | 4.9 | 2 | 5 | 4 | 4 | 5+ | 8- | 2.2 | 8.6 | 1.8 | 3.2 | 13 | 5 | 14 | 9 | 4+ | 4+ |
| 11 | 18.9 | 25.1 | 0.6 | 20.6 | 21.4 | 2 | 1 | 1 | 1 | 1- | 1+ | 7.8 | 1.9 | 8.5 | 10.8 | 5 | 2 | 3 | 2 | 1- | 1+ |
| 12 | 11.6 | 2.8 | 5 | 8.5 | 6.5 | 1 | 8 | 5 | 5 | 2- | 1- | 9.0 | 1.1 | 6.2 | 5.1 | 1 | 1 | 1 | 1 | 2- | 2- |
| 13 | 6.1 | 18.7 | 3 | 14.6 | 12.0 | 2 | 7 | 3 | 3 | 3 | 12+ | 9+ | 2.2 | 6.4 | 3.2 | 3.6 | 12 | 7 | 7 | 8 | 1+ | 2+ |
| 0.55 | 0.68 | 0.50 | -13.6 | -13.7 | 1.1 | 1.1 | 1.1 | 1 | -13.6 | +8.11 |

3.1 The technical basis of industrial finance

Based on the analysis of the overall average, it is found that the weighted influence coefficient from 2002 to 2007 is always less than 1, and the weighted sensitivity coefficient is more than 1, which indicates that the financial sector's role of supply to the national economy is significantly more than other sectors’ pulling effect generated by demand, at the same time it proves that China's national economy industry has a very strong correlation with the financial industry, and it provides sufficient pre-conditions for the development of China's financial industry. However, because of the independence of the financial industry itself, the current development results of China's industrial
finance are poor, and key industries and financial integration are still in the primary development stage. This also requires China's financial sector has the priority to develop, and continuously deepen the transformation, on the basis of which to promote the further development of China's financial industry. Based on the analysis of the structure, it can be seen that the demand correlation of the financial industry of China for the tertiary industry has been intensified in turn, followed by industry. This shows that the development of China's financial sector still needs the support of the tertiary industry and manufacturing operations, while the tertiary industry's demand for intermediate products in the financial sector is also very much [2].

China's financial industry development has certain independence, but in the various industries of the national economy, there is still a strong demand dependence on the financial industry. In addition, China's financial industry, tertiary industry and industrial manufacturing industry also have a strong correlation between the people, which also lays a good foundation for the organic integration of China's key industries and the financial industry.

3.2 The basis of the impact of industrial finance

Based on the growth state attribution matrix constructed in 2002~2005 and 2005~2007, the paper analyzes the direction of influence in the process of finance and industry development, and can also reflect the state of convergence of China’s relevant industries and finance effectively on this basis. According to the analysis of Table 1, it can be seen that in the development stage of China's financial sector industry in the period of 2002-2007, 80% of the industries and finances have promoted each other, and it also provides sufficient realistic foundation for the smooth development of industrial finance, which shows that the combination of industry and finance is conducive to the continuous development of each other. Because the financial industry itself has a very strong independence, the development of China's industrial finance is not optimistic, but it can also indicate to some extent that China's industrial finance has a good development prospect [3]. This paper mainly selects seven departments with the highest proportion of intermediate consumption of the financial sector as the research object, and conducts an in-depth analysis on the status quo of the industry and financial integration.

①Manufacturing. China's manufacturing industry has a very strong interaction with the financial industry from 2002 to 2007, and it can fully satisfy the assumption demand between the two which has a strong correlation. With the continuous development of China's manufacturing industry, the demand for financing has also increased to a certain extent. In the course of their own development, the financial departments have further improved the demand for electronic products such as communication equipment and computers, which has led to a different degree of integration. The analysis of Table 1 shows that China's manufacturing industry and financial development are both stimulated and pulled. However, because the manufacturing industry has a very strong dependence on financial financing, and the financial sector's restrictions on the SME loans, it will lead to the situation of "difficult loans and difficult loans" in China's economic development process. This has also caused very large restrictions and obstacles for the development of small and medium-sized manufacturing enterprises. This also requires China's financial sector to effectively solve the problem of difficult loans for small and medium-sized manufacturing enterprises, so that it can promote effectively the integration of the financial industry and the development of manufacturing.

②Leasing and business services. From 2002 to 2007, the demand effect of China's financial sector on leasing and commercial services was significantly greater than the latter's dependence on the financial industry, and it satisfies the assumption between the two which has a correlation. In recent years, China's financial industry has been continuously developed, and many financial industries have been launched that are integrated with leasing and business services. The specific forms of expression include financial leasing, technology financial leasing, logistics financial leasing and the like. This also makes the lease and business services industry and the financial industry show a good atmosphere of integration and development. However, because the financial industry itself has a relatively large risk, it also leads to the relatively large operational risks in the process of the development of leasing
and business services, which has caused certain obstacles and restraints to the development of the industry.

③ Accommodation and catering industry. The financial sector has a very high demand dependence on accommodation and catering, but because financial development has a very strong independence, even if its role on the accommodation and catering industry is stimulating, the integration of accommodation and catering industry and finance sector is still in a blank state in China.

④ Real estate industry. On the basis of not considering the independence of the financial sector, it has a very strong correlation with the real estate industry, which provides a good foundation for the emergence and development of real estate finance in China. China's real estate industry really entered the stage of capital financing in 1998. It mainly realized the organic integration with the financial industry through real estate credit, trust, pawn and housing provident fund. Based on the analysis of the direction of action, it is found that the financial part of China has been hindered by the development of the real estate industry during the period from 2002 to 2007. The main reason is that more than 75% of the funds of real estate in China are from banks, and there are very big financial risks. In addition, on the financial aspect, it is found that in the development of real estate finance, because of the huge risks involved in real estate loans, the financial industry must constantly improve its financial system and further strengthen financial supervision. On this basis, the bank's support for real estate financing has been reduced to a certain extent, and its loan check requirements have become higher, and to some extent restrict the further development of China's real estate industry [4].

⑤ Computer Industry. There is still a certain correlation between finance, information transmission, computer service and software industry. Analyzing the direction of influence, the two has a mutually reinforcing relationship. The integration is mostly in a good interactive state. On one hand, because the development of information technology industry requires strong support from the financial industry, and the application of computers, the popularity of networks, and the development of wireless technologies all must be supported by financial financing. In addition, the combination of China's financial industry and information technology has also launched a variety of technology, such as online banking, online securities and online payment, so that information finance has always maintained a good development trend, but there are still relatively small-scale problems.

⑥ Transportation industry and warehousing industry. The dependence of the financial sector on the transportation industry and the warehousing industry is also significantly lower than its supply impetus, which lays a good foundation for the integration of the two. Transportation finance is mainly realized by means of bank loans and transportation bond issuance of transportation enterprises. In 2002~2005, China's transportation industry, the warehousing industry and the financial industry played a very big role in it, but the latter has the opposite direction of influence. Because of the improper financing of the transportation industry and other factors, it has also had a certain adverse impact on the development of the financial industry, and the integration effect between the two has not been sufficiently reflected [5].

⑦ Wholesale and retail industry. The dependence of the wholesale and retail industry on the financial industry is relatively low, and the two industries have opposite influences on each other's development process. And there are cases where the influence effect is relatively small. There is also case with a low degree of integration between the two.

4. Conclusion

The financial industry is the basic industry of the national economy, because many industries are less dependent on it. However, because the development of the financial industry has certain independence, the demand for other industries is relatively small, which requires strengthening the research on China's industrial financial integration. And then on the basis of maintaining the financial industry's own development advantages, the direction of financial industrialization and industrial finance is constantly developing.
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