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Research on Dynamic Industrial Linkage and Impact Effect of Logistics Industry

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Abstract

Based on the input-output model, the industrial linkage and impact of China's logistics are investigated by aid of the input-output data released by the National Bureau of Statistics of the PRC. Three important conclusions are drawn from the investigation. First, the logistics industry has consumed the petrochemical industry, the transportation industry and the financial industry highly for a long time. However, the consumption on the tertiary industries, such as technical service and education, are still lowly. Second, China's logistics industry is a "low value-added, high-powered" industry. Finally, China's logistics industry's influence coefficient is higher than the sensitivity coefficient, indicating that China's logistics industry is driving the development of the national economy enhanced, but weakened by other sectors of the national economy.

Keywords

Logistics; Input-output analysis; Dynamics; Industrial linkage; industrial impact.

1. INTRODUCTION

Since the 21st century, China's logistics industry has developed rapidly and made certain achievements in the industry scale. In 2017, the total amount of social logistics in China reached 25.38 billion yuan, and 50.12 million people were employed in logistics posts. The logistics industry has played a positive role in promoting employment, boosting domestic demand, expanding consumption and other aspects. In 2014, the State Council issued a medium and long-term plan for the logistics industry (2014 - 2020), proposing that China's logistics industry should be regarded as the basic and strategic industry for the development of national economy, which marks the formal inclusion of the logistics industry in the strategic system of the national economic development. Therefore, how to develop our logistics industry efficiently, healthily and smoothly is a very important proposition. The logistics industry is a complex and huge industry, so it is an important prerequisite to promote the good and fast development of China's logistics industry by grasping the correlation and spread effect of the logistics industry and other industries in the national economy from the whole.

2. OVERVIEW OF RELEVANT RESEARCH LITERATURE

Since Leontief put forward the input-output method in 1936, this method has been widely used[1]. Lee analyzed the transportation sector in South Korea by using the input-output model and found that the production induction effect of transportation investment is greater than that of other sectors[2]. Magtibayramos et al. used the input-output model to analyze the business process outsoucing (BPO) sector in the Philippines and found that the BPO industry does not stimulate the Philippine economy and other industrial sectors[3]. Chiu adopted the input-output model to analyze the maritime industry in Taiwan and found that the maritime industry

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and shipping industry have higher backward correlation and production induction effect, but have relatively low supply shortage cost and price effect for the forward correlation[4]. Lim analyzed the U-city industry in Seoul using the input-output model and found that this industry has a strong forward correlation with other industries in the city[5].

At present, the study on the input-output analysis of logistics industry in China focuses on static analysis at regional level. For example, Lvcheng et al. used the input-output data in 2007 to analyze the logistics industry in the Yangtze River Delta region and the Beijing-Tianjin-Hebei region and found that the Beijing-Tianjin-Hebei region has a higher degree of extroversion than that of the Yangtze River Delta region, and the support for the industry is more obvious than that for the Yangtze River Delta region[6]. Zhu Zhanfeng analyzed the logistics in the Central Plains by the input-output data of Henan Province in 2005 and found that the support must be provided in policy and investment must be increased in the equipment and technology for the logistics industry[7]. Gao Suying et al. analyzed the trade and logistics industry in the Beijing-Tianjin-Hebei region by the input-output data in 2012, and found that the trade and logistics industry are closely related to the financial, manufacturing and technical service industry[8]. Zhang Qian et al. made the use of the input-output data in 2007 to analyze the logistics industry in Xinjiang region and found that the logistics industry in Xinjiang has strong driving ability and weak demand capacity[9].

Existing research at the regional level is not sufficient to illustrate the overall industrial characteristics of China's logistics industry. Although Zhang Jianghua and others have studied the position of China's logistic industry in the position of China's logistic industry in the national economy and the effect of industry correlation and other aspects [10], they only use the input-output data in 2007 for their research and still stays at a static angle. The analysis from the static perspective cannot reflect the dynamic development trend of China's logistics industry. At the same time, the logistics industry is divided between the generalized logistics industry and the narrow logistics industry. Due to the large number of intersections between the generalized logistics and other sections of the national economy, it's difficult to grasp the data. Therefore, the quantitative analysis in academy usually uses the logistics industry in the narrow sense, that is, the logistics industry refers to the industries that have changed the place of goods through transportation, warehousing and postal services, etc.[11-12].

In order to realize the dynamic study on the industry correlation and spread effect of the logistics industry in China from the national level, the overall dynamic quantitative study is conducted in this paper to the industry correlation and the spreading effect of the logistics industry in China by using the input-output mathematical model and the data from the input-output table in 2007, 2012 and 2015 released by the National Bureau of Statistics, with the focus on exploring: (1) the industrial dependence and restriction relationship between China's logistics industry and other related industries in the national economy; (2) the role and position of China's logistics industry in the national economy; (3) the development law and trend of China's logistics industry.

3. STUDY ON THE DYNAMIC INDUSTRY CORRELATION AND SPREAD EFFECT OF LOGISTICS INDUSTRY

3.1. Data Source and Processing

The data in the national input-output table in 2007, 2012 and 2015 prepared by the National Bureau of Statistics is used in the study of this paper. As the input-output table compiled in different years are different in terms of the sector, in order to facilitate the study on the correlation between the logistics industry and other industries in national economy, the industrial sectors compiled in different years are divided into 18 industries in this paper based on the national industry classification standards, namely, agriculture, mining and processing,

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light, petrochemical, metal products, general equipment manufacturing, transportation equipment manufacturing, communication manufacturing, water, electricity and gas supply, construction, wholesale and retail trade, logistics, accommodation and catering, financial, real estate, technology service, culture, education, health industry and other service industries. Represented by X1~X18.

3.2. Backward Correlation of Logistics Industry

The analysis on the backward correlation of industries include two aspects (direct backward correlation and complete backward correlation), which are represented by direct consumption coefficient and complete consumption coefficient. The value of the direct consumption coefficient of an industry reflects the close relationship between the two industries[13]. The direct consumption coefficient of the unit products produced by the j-th industry to the products of the i-th industry is defined as:

$$a_{ij} = Z_{ij} / X_j$$

The equation represents the direct consumption of the unit products produced by the j-th industry to the products of the i-th industry, in which, Z_{ij} stands for the product or service of the i-th industry that are directly consumed in the production of the j-th industry ; X_j is the total investment in the production of the i-th industry; and i,j=1,2,...,n, and n is the total number of the industry.

In order to reflect the direct and indirect economic links between industries, the complete consumption coefficient is generally used for expression. The greater the complete consumption coefficient, the greater the direct or indirect relationship between the two industries. The smaller complete consumption coefficient indicates the smaller correlation between the two industries. The complete consumption coefficient b_{ij} is defined as:

$$b_{ij} = a_{ij} + \sum_{k=1}^{n} b_{ik} a_{kj}, \quad i, j = 1, \cdots, n$$

The calculation formula of the consumption coefficient matrix $B = (b_{ij})_{n \times n}$ can be obtained by simple matrix transformation:

$$B = (I - A)^{-1} - I \tag{1}$$

Among then, $A = (a_{ij})_{n \times n}$ is the matrix of direct consumption coefficient, I is the unit matrix of n

order. Compared with the direct consumption coefficient, the complete consumption coefficient can reflect the direct and indirect relationship between the industry more comprehensively.

On the basis of the data in the input-output table from 2007 to 2015, the direct and indirect consumption coefficient of the backward-related industries of China's logistics industry can be calculated by using formula (1) are shown in Table 1.

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Table 1. Analysis on Backward Correlation of China's Logistics Industry

Sector	Direct consumption coefficient			Complete consumption coefficient		
	2007	2012	2015	2007	2012	2015
X1	0.0117	0.0128	0.0089	0.0575	0.0678	0.0728
X2	0.0047	0.0009	0.0007	0.1379	0.1362	0.0767
X3	0.0195	0.0216	0.0261	0.1114	0.1280	0.1561
X4	0.1959	0.1594	0.1036	0.4533	0.4227	0.3171
X5	0.0087	0.0084	0.0059	0.1356	0.1279	0.1116
X6	0.0202	0.0151	0.0121	0.0767	0.0556	0.0551
X7	0.0669	0.0696	0.0846	0.1263	0.1302	0.1651
X8	0.0076	0.0044	0.0044	0.0940	0.0753	0.0826
X9	0.0129	0.0214	0.0249	0.0985	0.0941	0.0992
X10	0.0038	0.0079	0.0081	0.0059	0.0151	0.0154
X11	0.0124	0.0212	0.0246	0.0397	0.0676	0.0800
X12	0.0698	0.1421	0.1597	0.1177	0.2137	0.2419
X13	0.0120	0.0135	0.0178	0.0279	0.0296	0.0379
X14	0.0489	0.0831	0.0887	0.0819	0.1500	0.1667
X15	0.0088	0.0162	0.0202	0.0348	0.0756	0.0954
X16	0.0104	0.0108	0.0123	0.0295	0.0369	0.0410
X17	0.0044	0.0027	0.0041	0.0120	0.0086	0.0118
X18	0.0193	0.0187	0.0192	0.0298	0.0324	0.0359

It can be seen from Table 1 that, China's logistics industry has distinctive characteristics in terms of backward linked industry categories and changing trend, specifically:

First, the backward correlation of the logistics industry with the petrochemical, transportation and financial industry is significantly higher than that of other industries. In 2015, the four industries with the highest direct consumption coefficient of China's logistics industry were petrochemical industry, transportation equipment industry, logistics industry and financial industry, with the direct consumption coefficient of 0.1036, 0.0846, 0.1597 and 0.0887 respectively. It indicates that for every 10,000 yuan of products or services produced by the logistics industry in China, it directly consumes the 1,036 yuan of petrochemical industry, 846 yuan of transportation equipment manufacturing industry, 1,597 yuan of the logistics industry and 887 yuan of financial industry. In terms of the complete consumption coefficient, the above four industries consume the most with the coefficient of 0.3187, 0.1659, 0.2416 and 0.1671 respectively.

Second, China's logistics industry and petrochemical, transportation equipment related industries have maintained a long-term high degree of backward correlation, but its backward correlation with technical service related industries is significantly lower. The direct consumption coefficient of the logistics industry for technical service industry was 0.0104, 0.0108 and 0.0123 respectively in 2007, 2012 and 2015. The direct consumption coefficient of the logistics industry for culture, education and health industry were 0.0044, 0.0027 and 0.0041 respectively in these three years, indicating that for every 10,000 yuan of products or services produced by the logistics industry, it directly consumes only 104 yuan, 108 yuan and 123 yuan of the technical service industry in 2007, 2012 and 2015; an only 44 yuan, 27 yuan and 41 yuan of the education industry.

Thirdly, the logistics industry consumes most of the industries indirectly. After comparing the average of direct and complete consumption coefficient in 2007, 2012 and 2015, it can be found that the complete backward correlation between the logistics industry and various industries is significantly larger than the direct backward correlation (Figure 1). The complete consumption coefficients of the logistics industry in these three years are almost three times the direct consumption coefficients, which indicates that the logistics industry has a obvious pulling function for the indirect demand of various sections in the national economy.

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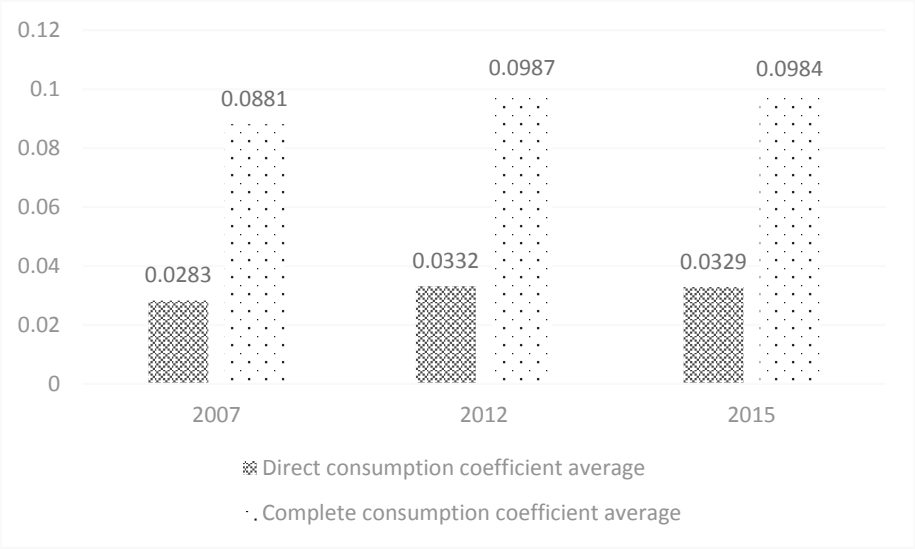

Figure 1. Dynamic comparison between the direct and complete consumption coefficients of the logistics

3.3. Forward Correlation of Logistics Industry

The industry forward correlation analysis also includes two aspects: direct forward correlation and complete forward correlation, which are expressed by direct distribution coefficient and complete distribution coefficient. Direct Distribution Coefficient is defined as the analysis of economic and technological linkages between industries from the perspective of output.

$$h_{ij} = z_{ij} / (X_i + M_i), \ i = 1, \cdots, n, \ j = 1, \cdots, n, n+1, \cdots, n+u$$

It indicates the share of products that can be allocated by the j-th department in the unit output of the i-th department, also known as the output coefficient, which can measure the demand level of the j industry for the i industry. When j=n+1, ..,n+u the value of the product or service that the i-th industry provides to the j-th industry for final use; u is the final number of items; M means import; Xi+Mi, is the first industry Total supply (domestic production + imports) .

The direct distribution coefficient indicates the direct distribution relationship between industries, and the full distribution coefficient is used for the complete distribution relationship between industries. The greater the ratio of the full distribution coefficient, the more obvious the driving effect of one industry on another. The full distribution coefficient is defined as

$$d_{ij} = h_{ij} + \sum_{k=1}^{n} h_{ik} g_{kj}, \quad i, j = 1, \cdots, n.$$

The calculation formula of the consumption coefficient matrix $D = (\mathrm{d}_{ij})_{n \times n}$ can be obtained by simple matrix transformation:

$$D = (I - H)^{-1} - I \tag{2}$$

Among them $H = (\mathrm{h}_{ij})_{n \times n}$ Indicates the direct assignment coefficient matrix.

Based on the data of China's input-output table from 2007 to 2015, the direct and complete distribution coefficients of the forward-related industries in China's logistics industry using formula (1) are shown in Table 2.

It can be seen from Table 2 that China's logistics industry also has distinct characteristics in terms of forward-related industry categories and trends. Specifically:

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First, the direct forward linkage degree between China's logistics industry and the petrochemical industry, transportation equipment industry, logistics industry itself, accommodation and catering industry and financial industry is significantly higher than other industries in the national economy. In 2015, the direct forward relationship between the logistics industry and these industries was greater than 0.04, indicating that the intermediate investment of 10,000 yuan of products or services produced by the logistics industry was above 400 yuan. The complete forward linkage with these industries is greater than 0.10, that is, the 10,000 yuan of products or services produced by the logistics industry have an intermediate investment of more than 1,000 yuan. It shows that the production demand of the above-mentioned industries directly affects the sales of logistics products, and their development has a greater effect on the logistics industry.

Second, the degree of correlation between the logistics industry and various industries is generally on the rise. The logistics industry has the greatest increase in the transportation equipment industry. In 2007, the direct forward correlation between the logistics industry and the transportation equipment industry was 0.0658, and it was 0.0834 in 2012. In 2007, the complete forward linkage between the logistics industry and the transportation equipment industry was 0.1242, and in 2015 it was 0.1634. The reason for the forward linkage between the logistics industry and the transportation equipment industry is obvious: the development of the logistics industry is inseparable from transportation. In recent years, China's transportation equipment industry has been developing strongly, transportation tools are diversified, and the development of transportation equipment industry is developing for the logistics industry. The pulling effect is more obvious.

Third, the complete forward linkage between the logistics industry and various industries is significantly higher than the direct forward linkage. Comparing the average of the direct distribution coefficient and the average of the full distribution coefficient for the three years of 2007, 2012 and 2015 can be found. In the three years, the complete consumption coefficient of the logistics industry is almost three times the direct consumption coefficient (Figure 2). This shows that the development of the logistics industry has a very strong indirect demand driving effect on the development of various industrial sectors of the national economy.

Table 2. Forward linkage analysis of China's logistics industry

Sector	Direct distribution coefficient			Complete distribution coefficient		
	2007	2012	2015	2007	2012	2015
X1	0.0078	0.0089	0.0068	0.0381	0.0470	0.0554
X2	0.0052	0.0011	0.0010	0.1532	0.1574	0.1159
X3	0.0057	0.0066	0.0081	0.0326	0.0392	0.0483
X4	0.0765	0.0613	0.0433	0.1770	0.1627	0.1326
X5	0.0028	0.0028	0.0022	0.0433	0.0420	0.0414
X6	0.0166	0.0127	0.0114	0.0630	0.0470	0.0519
X7	0.0658	0.0667	0.0834	0.1242	0.1248	0.1626
X8	0.0030	0.0021	0.0022	0.0364	0.0365	0.0409
X9	0.0124	0.0248	0.0301	0.0946	0.1089	0.1200
X10	0.0020	0.0035	0.0033	0.0031	0.0068	0.0062
X11	0.0139	0.0182	0.0190	0.0446	0.0581	0.0619
X12	0.0698	0.1421	0.1597	0.1177	0.2137	0.2419
X13	0.0262	0.0359	0.0485	0.0610	0.0786	0.1034
X14	0.0814	0.0873	0.0819	0.1363	0.1576	0.1538
X15	0.0107	0.0132	0.0138	0.0425	0.0614	0.0655
X16	0.0214	0.0133	0.0141	0.0605	0.0457	0.0470
X17	0.0052	0.0034	0.0045	0.0140	0.0107	0.0130
X18	0.0234	0.0209	0.0214	0.0362	0.0362	0.0401

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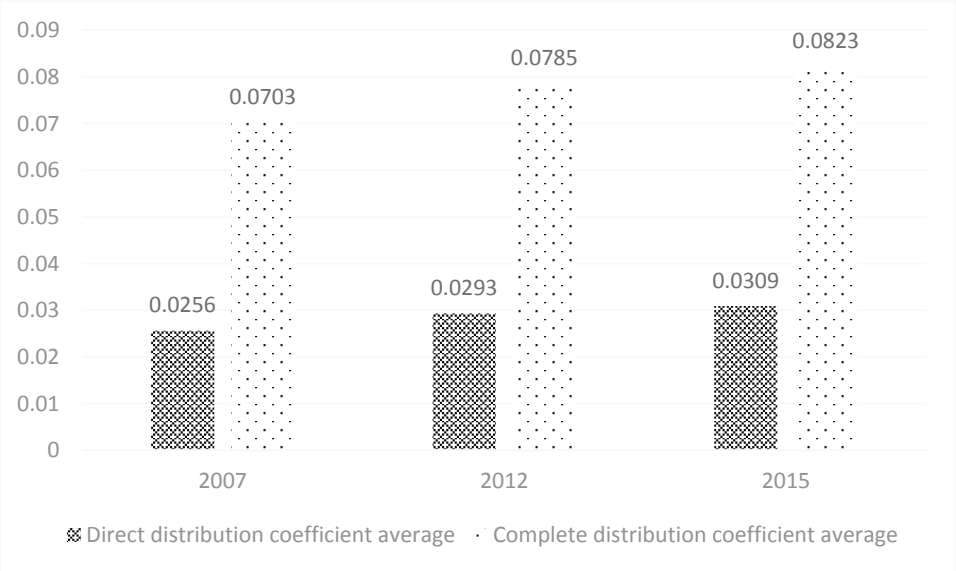

Figure 2. Dynamic comparison between direct and complete distribution coefficients of the logistics

4. ANALYSIS OF INTERMEDIATE DEMAND AND INTERMEDIATE INVESTMENT IN LOGISTICS INDUSTRY

The intermediate input rate of an industry refers to the ratio of the intermediate input of an industry to the total input of the industry[14]. It reflects the proportion of intermediate products that need to be purchased from other industries in the production process. The intermediate input rate of the j-th industry is defined as

$$F_j = \sum_{i=1}^{n} x_{ij} / X_j$$

Among them, $\sum_{i=1}^{n} x_{ij}$ is the middle input of the j-th industry in production or service, X_j is the total

investment of the

First j industry,j=1,2,...,n.

The intermediate demand rate refers to the ratio of the sum of the intermediate demand of the national economy to an industrial product to the total demand of the whole society for this product [15]. The higher the intermediate demand rate indicates that the industry has the property of providing intermediate products; the lower the intermediate demand rate indicates that the industry has the property of providing the final product. The intermediate demand rate of the i-th industry sector is defined as

$$G_i = \sum_{j=1}^{n} x_{ij} / (\sum_{j=1}^{n} x_{ij} + Y_i)$$

Among them $\sum_{j}^{n} x_{ij}$ is the sum of the intermediate demand for the i-th industrial products by various

industrial

Sectors; Y_i is the final demand of the i-th industrial sector i=1,2,...,n.

Where, $\sum_{j}^{n} x_{ij}$ is the sum of the intermediate demand of the i-industrial products of each industrial

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sector;

Y_i is the final demand of the i-th industrial sector, i=1, 2,...,n

According to the calculation of the intermediate demand rate and the intermediate input rate of China's logistics industry, it is found that:

First, at this stage, China's logistics industry is a low value-added industry. The intermediate investment rate of China's logistics industry from 2007 to 2015 is above 0.5380 (Figure 3). That is, for every 1 yuan increase in China's logistics industry, it will require at least 0.5380 yuan of intermediate investment in various sectors of the national economy. This also shows that the Chinese logistics industry is highly dependent on other sectors of the national economy. In 2015, the intermediate investment rate of China's logistics industry was 0.6256, and the added value rate of China's logistics industry was about 38%. China's logistics industry has an intermediate investment rate of more than 50% from 2007 to 2015.

Second, at this stage, China's logistics industry is an intermediate product industry. The intermediate input rate and intermediate demand rate of China's logistics industry are both greater than 50% (Figure 3). According to the division of industry types by economists such as Chenery, China's logistics industry is an intermediate product industry. This shows that on the one hand, the development of China's logistics industry has been driven by the growth of the national economy for a long time; on the other hand, many logistics companies in China have not realized that their own service scope is small and the added value of business is low. I just want to be responsible for the transportation of goods and goods. I did not expect to increase the added value of the intermediate links and create greater economic benefits for my own development. This is also the reason that restricts the further development of China's logistics industry.

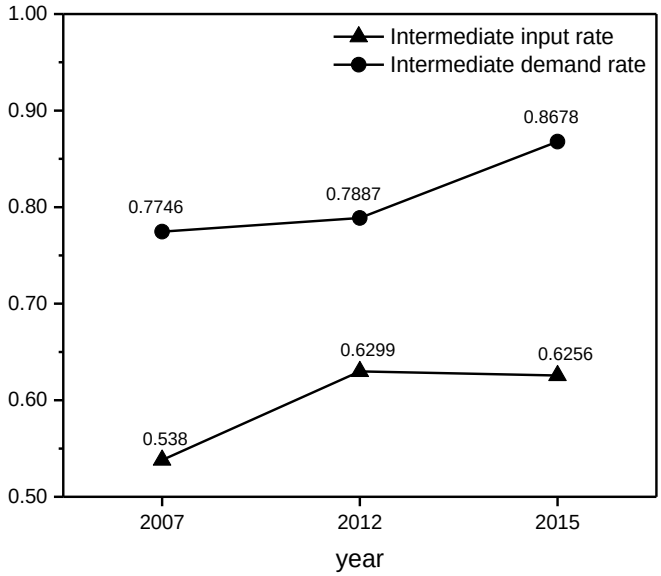

Figure 3. Intermediate input and demand rates of China's logistics

5. THE ANALYSIS ON THE INDUSTRY SPREADING EFFECT OF CHINA'S LOGISTICS INDUSTRY

5.1. 4.1 Analysis on the Influence of the Logistics Industry

The coefficient of influence reflects the extent to which production demand produced by all industries in the national economy is affected for every additional end-use unit in an industry. When an industry's coefficient of influence is greater than 1, it indicates that the impact of the production of the industry on other industries exceeds the social average level, and this industry

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is the key to the development of national economy. The coefficient of influence of the j – th industry on the national economy is:

$$\delta_j = n\sum_{i=1}^{n}\tilde{b}_{ij} / \sum_{j=1}^{n}\sum_{i=1}^{n}\tilde{b}_{ij} \tag{3}$$

Among them, n is the number of industries, b_{ij} is the element in the Leontief inverse matrix $(I-A)^{-1}$. $\sum_{i=1}^{n}\tilde{b}_{ij}$ is the influence of the j industry, and j=1,2,,..,n.

Table 3. Influence and Influence Coefficient of China's Logistics Industry

Sector	Influence			Influence Coefficient		
	2007	2012	2015	2007	2012	2015
X11	2.0690	1.7555	1.9377	0.7152	0.6146	0.6482
X12	2.6706	2.8674	2.9322	0.9231	1.0039	1.0274
X13	2.7883	2.6362	2.6987	0.9638	0.9229	0.9027
X14	1.7754	1.9929	1.8573	0.6137	0.6977	0.6213
X15	2.1934	2.2326	2.4265	0.7582	0.7817	0.8117
X16	2.3133	2.7370	2.7481	0.7997	0.9582	0.9192
X17	2.6812	2.2742	2.3070	0.9268	0.7962	0.7717
X18	2.4542	2.2714	2.2573	0.8484	0.7952	0.7551

The influence and influence coefficient of China's logistics industry in 2007, 2012 and 2015 can be calculated by formula (3), among which, the influence and influence coefficient of the tertiary industry are shown in Table 3. It can be seen from Table 3 that:

First, the influence of China's logistics industry is in a leading position in the tertiary industry. In 2015, the production of the final product with an increase of 1 yuan in the China's logistics industry will increase the total output of the national economy by 2.9322 yuan, while the coefficient of influence is 1.0274, which indicates that the influence of the logistics industry is 1.0274 times of the average level of all industries, and the logistics industry is in the leading position in the tertiary industry.

Second, the influence and influence coefficient of China's logistics industry are constantly improving. The influence increased from 2.6706 in 2007 to 2.9322 in 2015, and the influence coefficient showed an upward trend in 2007 – 2015. It can be seen that China's logistics industry's absolute driving force and relative driving force to the national economy has been improved, and the logistics industry has increasingly become the backbone of China's national economic growth.

5.2. Analysis on the Sensitivity of the Logistics Industry

The sensitivity coefficient indicates the ratio of the sensitivity of an industry to the sensitivity of all industries in the national economy when each industry increase by one unit. When the sensitivity coefficient is greater than 1, it means that the sensitivity of this industry is above the average level, and vice versa. The sensitivity coefficient of the i – th industry to the national economy is defined as

$$\theta_i = n\sum_{j=1}^{n}\tilde{b}_{ij} / \sum_{j=1}^{n}\sum_{i=1}^{n}\tilde{b}_{ij} \tag{4}$$

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Among them, b_{ij} is the element of Leontief inverse matrix $(I-A)^{-1}$, $\sum_{j=1}^{n}\tilde{b}_{ij}$ is the sensitivity of the

i – th industry, and i=1,2,...,n.

The sensitivity and sensitivity coefficient of China's logistics industry from 2007-2015 can be calculated by formula (4), among which the sensitivity and sensitivity coefficient of the tertiary industry is shown in Table 4. It can be seen from Table 4 that:

First, the sensitivity coefficient of China's logistics industry is significantly lower than that of the financial industry and the real estate industry in the tertiary industry. The sensitivity coefficient of China's logistics industry in 2015 was 2.9004, which indicates that for every 1 yuan increase in the final products of various industries in the national economy, the final products of the logistics will increase by 2.9004 yuan. At the same time, the sensitivity coefficient of China's logistics industry in 2015 was 0.9862, lower than the social average level. These indicate that China's logistics industry is less driven by the national economic development than other national industries.

Second, the sensitivity and sensitivity coefficient of China's logistics industry are constantly increasing. From 2007 to 2015, the sensitivity and sensitivity coefficient of the logistics industry showed a small upward trend. The sensitivity increased to 2.8454 in 2015 from 2.4915 in 2007, and the sensitivity coefficient increased from 0.8612 in 2007 to 0.9518 in 2015. This shows that the logistics industry is being increasingly driven by the national economy.

By comparing the influence coefficient and sensitivity coefficient, it can be seen that the influence coefficient of China's logistics industry is greater than the sensitivity coefficient, indicating that the role of China's logistics industry in promoting the national economy is greater than the role of the national economy in driving the logistics industry.

Table 4. Sensitivity and Sensitivity Coefficient of China's Logistics Industry

Sector	Sensitivity			Sensitivity Coefficient		
	2007	2012	2015	2007	2012	2015
X11	1.8735	2.3000	2.5774	0.6476	0.8052	0.8622
X12	2.4915	2.5798	2.8454	0.8612	0.9032	0.9518
X13	1.5639	1.4045	1.5217	0.5406	0.4917	0.5090
X14	2.0381	2.6864	3.0187	0.7045	0.9405	1.0098
X15	1.8848	2.5117	3.0445	0.6515	0.8794	1.0184
X16	1.6383	1.8247	1.9402	0.5663	0.6388	0.6490
X17	1.2741	1.1619	1.2247	0.4404	0.4068	0.4097
X18	1.3645	1.3485	1.4440	0.4717	0.4721	0.4830

6. RESEARCH CONCLUSIONS AND POLICY RECOMMENDATIONS

First, the related industries such as the petrochemical, transportation equipment and finance industry are still the main consumption industries of the logistics industry in China. As a result, it is still of great significance to the development of China's logistics industry by promoting the development of the petrochemical, transport equipment and finance industries and effectively providing the products or services required by the development of the logistics industry. However, this also shows that the logistics industry in China has a large proportion of consumption expenditure on basic logistics such as petrochemical, transportation equipment and finance industry, and has a relatively low proportion of consumption on non-basic logistics, such as technical services, culture, education and health industry. Therefore, China's logistics

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industry needs to strengthen the awareness of talent training, introduce advanced management service level and optimize its own industrial structure.

Second, China's logistics industry has long been a low value-added industry. Due to its low service level and narrow service scope, China's logistics industry has a low added value in the logistics industry. Therefore, we must pay attention to the establishment of the brand image of the logistics industry, fully realize that the level of service can directly affect the healthy long-term development of the logistics industry, strengthen the relationship between the logistics industry and other industries, and expand the service scope of the logistics industry.

Thirdly, we can find by comparing the influence coefficient and sensitivity coefficient of the logistics industry that the influence coefficient is greater than the sensitivity coefficient, indicating that the logistics industry plays a strong role in promoting the development of the national economy while is less driven by the national economy. We can see from the trend of change that the influence coefficient in 2012 is higher than the social average level, and the sensitivity coefficient keeps lower than the social average level, indicating that, relative to other industries, the role of the logistics industry in driving the development of national economy is increasing while it is less driven by the national economy. Therefore, the government should adopt an active development strategy. On the one hand, it should regulate the market order of the logistics industry, and give the logistics industry a good environment for industry development; on the other hand, it should continuously optimize the infrastructure of the logistics industry, especially in remote areas, and it should make great efforts to build logistics centers and cargo transit bases, so as to continuously enhance the correlation and radiation role of the logistics industry in the national economy.

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