

Analysis of Influactors of Chongqing Logistics Industry based on Measurement Analysis

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Abstract

With the development of market economy and online industry, the logistics industry has risen rapidly become a hot industry to guide production, promote consumption and promote regional economic development in recent years. As the central hub in the west of the Yangtze River Economic Belt and a national logistics node city, Chongqing has great advantages in geography, technology and national strategy. Based on the measurement and analysis method, this paper uses the time series data of Chongqing logistics industry from 2012 to 2021 to analyze its development influencing factors, and makes the evaluation and corresponding suggestions.

Keywords

Logistics Industry; Measurement and Analysis Method; High-Quality Development.

1. Introduction

As the third party profit growth point of modern society, logistics industry has become a new industry for various regions and major industries to cultivate and develop. In recent years, with the further deepening of the coordinated development layout of regional economy, the influence of the logistics industry on the national economy and the boost to the transformation and upgrading of enterprises have gradually increased. Based on the improvement of comprehensive economic strength and perfect infrastructure, Chongqing logistics industry has continuously achieved new breakthroughs in green, open, innovation and other aspects, and has gradually become a pillar industry and a new economic growth point.

The overall development level of the logistics industry in Chongqing is good and rapid, but there are still unbalanced and unreasonable development. The traditional transaction mode occupies a dominant position, low level of modernization, insufficient development of high-end business forms, and high cost of the logistics industry are more prominent. The "14th Five-Year Plan for the Development of Chongqing Modern Logistics Industry (2021-2025)" proposes to promote the modernization of the logistics industry governance system and governance capacity, and form a new situation in the modernization of the logistics industry.(Source: The 14th Five-Year Plan for the Development of Modern Logistics Industry in Chongqing municipality (2021-2021)) In this regard, this paper combines with the existing research, uses the measurement and analysis method, and empirically analyzes the multiple factors affecting the development of Chongqing tourism industry, and makes a targeted correction and improvement, in order to provide feasible suggestions for the comprehensive and balanced development of Chongqing logistics industry.

2. State-of-the-Art

Chongqing is located in the junction of relatively developed eastern region and resource-rich western region, with vast economic hinterland. It is the inland port city with "golden waterway" of the Yangtze River, one of the "two vertical and three horizontal" main channels, and Shanghai-Kunming (Chengdu) channels in Chongqing, Chongqing, and Chongqing Jiangbei

International Airport, one of the national trunk airports. Chongqing is an important integrated water, land and air transportation hub and material distribution center in the upper reaches of the Yangtze River. It has obvious geographical advantages and is the only comprehensive comprehensive transportation hub with complete water, land and air transportation conditions in western China. In addition, Chongqing three-dimensional traffic network is speeding up the formation, has been formed in the city as the core of "ring" highway and "ring" railway skeleton, and "a small" airport pattern, is speeding up the construction of "three hub five key" port system, preliminary built relatively complete port system, provide for the development of the good infrastructure logistics industry.

On the whole, the development of Chongqing's logistics industry presents an upward trend, and the comprehensive strength of the logistics industry continues to enhance, which plays a good role in supporting and guaranteeing the high-quality development of Chongqing's economy. By 2022, the railway, highway and waterway traffic volume in Chongqing reached nearly 130,000 tons; the logistics costs decreased steadily, and the total social logistics cost to GDP ratio decreased by 2% during the 13th Five-Year Plan period to 14.5%. Chongqing has actively built a new pattern of logistics industry, deeply integrated into the industrial chain, accelerated the construction of a modern logistics system, and achieved good achievements in the development of the city's logistics industry, but there are still some gaps compared with the level required by the whole country.

The development situation of Chongqing logistics industry is mainly manifested in the following aspects:

(1) The overall level is good

As shown in Figure 1, from 2012 to 2021, the total social logistics in Chongqing increased year by year, and the proportion of the total logistics in the average annual GDP increased year by year, and its importance in social and economic development increased year by year. Under the strong household consumption and the support of national policies, the logistics industry in Chongqing operates steadily and gradually, and the total revenue of the industry gradually increases.

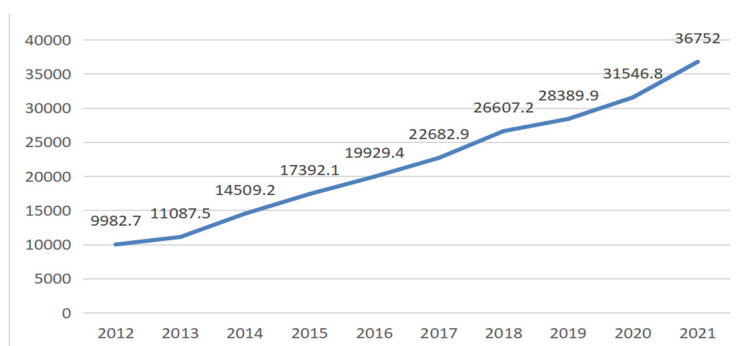


Figure 1. Total social logistics in Chongqing from 2012 to 2021

In addition, Chongqing municipality is committed to the construction of domestic and foreign logistics hubs and port highlands, in the logistics and freight structure has been adjusted accordingly, in order to build an international logistics channel. In the four modes of logistics industry transportation, the proportion of the road freight mode has gradually narrowed, and the railway and waterway transportation maintains a relatively stable state, and the air freight mode continues to maintain a good growth trend.

(2) Development problems are prominent

On the one hand, due to the regional economic level, infrastructure construction and transportation layout, Chongqing regional logistics industry development level imbalance, and

the lack of logistics resources integration and overall configuration, some facilities utilization efficiency is not high, excessive allocation of resources to the central city, the edge area in equipment, technology, information, there are certain fault. On the other hand, the efficiency and integration degree of logistics organization need to be improved, the momentum of innovation and development is not strong, the application of new technologies, new business forms and new models needs to be widely promoted, and the integration of the logistics industry and other industries is not deep enough, resulting in the lack of effective demand and the lack of development impetus of the industry. Specific analysis is as follows:

1)Third-party logistics enterprises have a small scale and a lack of management experience

At present, Chongqing logistics enterprise scale is small, the lack of large first-party logistics leading enterprises. Because most of the third-party logistics enterprises in Chongqing are derived from the traditional enterprise differentiation and transformation, the scale of the enterprises is relatively small, that is, the logistics affairs with a small amount of production and connection, so it is difficult to give full play to the advantages of scale. At the same time, because most of these third-party logistics enterprises are born from production enterprises, often lack logistics management experience, let alone international vision, and the lack of management experience, will directly affect the first party logistics enterprises to become bigger and stronger.

2)The technical service system supporting the development of modern logistics is not perfect enough

First, enterprises need to promote modern logistics management and lack of technical support. Few suppliers, production enterprises and commercial enterprises in Chongqing implement information system management such as lean production, on-time production or manufacturing resource plan MRPERPMIS. Moreover, the construction of information system of logistics enterprises also lags behind, while the construction of information network system among enterprises is even slower. Second, logistics enterprises and equipment standards and norms are not unified. Logistics equipment standards are not matched, the lack of connection between logistics packaging standards and logistics facilities standards. Third, the lack of professional modern logistics research and consulting institutions, it is difficult to provide high-quality technical consultation.

3)Lack of logistics professionals

The number of logistics professionals is seriously out of touch with the market needs, which cannot meet the needs of the future logistics development in Chongqing. Chongqing existing personnel engaged in logistics (in fact, mainly engaged in transportation and storage work) can not adapt to the development requirements of modern logistics industry requirements. Talent problem has become a huge obstacle to the development of logistics industry in Chongqing. Because logistics is still a new thing in our country. Therefore, there is a great shortage of talents who can truly understand modern logistics and distribution, especially in Chongqing.

(3) Both opportunities and challenges coexist

1)Challenge

Influenced by internal and external factors, the development of logistics industry in Chongqing is facing a series of challenges. From the perspective of the external environment, the impact of COVID-19 is still inevitable. In addition, China is currently in a complex environment of profound changes unseen in a century, and there are many uncertain factors in the external environment. In addition, with the increase of oil prices, tolls and other costs, the increase of transportation costs has brought great pressure to the operation of enterprises, and the logistics industry is imminent in seeking to get rid of the traditional mode of reform and upgrading, which will further aggravate the competition in the industry and boost a new round of reshuffle of the logistics industry. From the perspective of the industry, because many

enterprises are not very perfect in the operation mode, the connectivity of each link has not yet formed a relatively mature form, the lack of understanding of the market, resulting in a serious asymmetry between supply and demand.

2) Opportunities

Located in the hinterland of southwest China, Chongqing is an important node between the "Belt and Road" and the Yangtze River Economic Belt. In addition, the flow of cross-border e-commerce business in Chongqing itself is also very large, so the opening of the free trade zone brings more convenience to the development of international logistics in Chongqing.

First of all, the realization of the "single window" of international trade in the free trade zone effectively shortens the circulation time of international orders. The single-window realization not only simplifies the administrative examination and approval procedures, but also breaks the trade barriers formed by the customs duties and cumbersome customs clearance procedures, and effectively improves the international logistics circulation efficiency; secondly, the free trade zone construction effectively expands the functions of the port, and builds a new international logistics center in line with the characteristics of the free trade zone. The development of the free trade zone has transformed the port from a single logistics function, and gradually realized the integrated construction of cross-border marketing, storage, logistics and settlement. In this way, some cross-border enterprises with relatively large business volume do not need to set up multiple warehouses outside, but can directly realize the booking, storage and delivery requirements from the bonded area warehouse, effectively reduce the logistics cost, and greatly shorten the logistics flow time; third, high and new technology continuously improve the service quality of international logistics in the free trade zone. Chongqing area itself has covering water, land, air international logistics system, the establishment of the free trade zone is to realize the customs multimodal transport regulation, plus the Internet of things, big data, cloud computing, artificial intelligence and other high and new technology, makes the Chongqing international logistics more toward the direction of efficient and intelligent logistics, logistics supply chain scheme to further realize the optimization.

With the gradual return of the normal economic operation and the full implementation of the 14th Five-Year Plan, the logistics demand for investment, consumption and foreign trade will continue to reply, and the logistics business activities will maintain a good level, and the transformation and upgrading of the logistics industry needs to be put on the agenda. In addition, the logistics operation environment has been improved under the high attention of the government, the three-dimensional system of transportation network has been improved, the weak links of infrastructure have been consolidated as the logistics industry, and the vicious competition and unreasonable operation in the industry has also been improved.

3. Empirical Analysis

Based on the above analysis, it is not difficult to see that the cultivation and development of the current logistics industry plays an important role in the economy and society of Chongqing. To this end, this paper continues to study the influencing factors, and further illustrate the deep connection between the logistics industry and the economic society and the life of residents through the relevant data of the past decade.

(1) Samples and variables

The explained variable is expressed as the total amount of social logistics in Chongqing. Considering the incomplete data in 2022, the data from 2012-2021 are mainly selected. The core explanatory variables are Chongqing social GDP, per capita consumption level, transportation volume, and Internet coverage rate (expressed by the number of Internet broadband access users). The degree of interpretation and influence of the explanatory

variables on the explained variables is studied. Control variables indicate the social and economic factors affecting the development of the logistics industry, mainly including: 1) urbanization level. Urbanization level is related to the flow and aggregation of elements and resources, which is expressed by the urbanization rate.2) Level of fiscal expenditure. The level of local financial expenditure affects the local infrastructure construction, especially the construction of large transportation facilities such as high-speed rail depends on the government financial support.

Table 1. Descriptive statistics

Variable name	mean	standard error	least value	crest value
Total social logistics	21887.97	8921.206	9982.7	36752
Gross social product	19096.41	5320.294	11595.37	27390.17
per capita consumption level	17121.5	3962.995	11092	22589
quantity of shipments	97358.4	32496.76	13472	128234
Internet coverage	1715.578	709.368	770.81	2698.32

Data source: Chongqing Statistical Yearbook, China Logistics Yearbook

(2) Model setting

Least squares estimation was performed for the above data, and the results are shown in Figure 2.

Variable	Coefficien...	Std. Error	t-Statistic	Prob.
C	-5879.960	3809.028	-1.543691	0.1833
X1	1.552334	1.379166	1.125560	0.3115
X2	-0.270923	1.658734	-0.163331	0.8767
X3	-0.012678	0.018612	-0.681171	0.5260
X4	2.329709	2.667372	0.873410	0.4224
R-squared	0.996167	Mean dependent var	21887.97	
Adjusted R-squared	0.993101	S.D. dependent var	8921.206	
S.E. of regression	740.9988	Akaike info criterion	16.36073	
Sum squared resid	2745396.	Schwarz criterion	16.51202	
Log likelihood	-76.80364	Hannan-Quinn criter.	16.19476	
F-statistic	324.8829	Durbin-Watson stat	2.869229	
Prob(F-statistic)	0.000003			

Figure 2. Shows the OLS parameter estimation

The results estimated by the multiple linear regression model are:

$$Y = -5879.96 + 1.5523X_1 - 0.2709X_2 - 0.0127X_3 + 2.2397X_4$$

$$(3809.028) \quad (1.3792) \quad (1.6587) \quad (0.0186) \quad (2.6673)$$

$$t = (-1.5437) \quad (1.1256) \quad (-0.1633) \quad (-0.6812) \quad (0.8734)$$

$$R^2 = 0.9962, \bar{R}^2 = 0.9931, F = 324.8829, DW = 2.8692$$

According to the model estimation results, both the dependent coefficient R2 and the modified dependent coefficient are large values, and the overall model has a better goodness of fit to the sample. From the F statistics, the regression equation is significant on the whole, that is, the gross social product, per capita consumption level, freight volume and Internet coverage rate have a significant impact on the total amount of social logistics in Chongqing. However, the t-statistic of the explanatory variables is relatively small, and the parameters of the per capita consumption level and the freight volume are negative, which is not consistent with the theoretical and economic significance.

In conclusion, the model may have multicollinearity problems and require model correction.

(3) Model correction

1) Multiplex collinearity test

According to the correlation coefficient, it is known that except that the correlation coefficient between the explanatory variables X1 and X3 is negative, and the direct correlation coefficient of the other explanatory variables is greater than 0.8, indicating that there is a serious multicollinearity.

	X1	X2	X3	X4
X1	1.000000	0.996540	-0.177337	0.987574
X2	0.996540	1.000000	-0.104359	0.988858
X3	-0.177337	-0.104359	1.000000	-0.095263
X4	0.987574	0.988858	-0.095263	1.000000

Figure 3. Correlation coefficient matrix

2) Step by step

Stewise regression using eviews software directly gives the regression model as shown in Fig:

Variable	Coefficien...	Std. Error	t-Statistic	Prob.*
C	-6279.636	2671.798	-2.350341	0.0570
X1	1.334403	0.319389	4.177986	0.0058
X3	-0.015337	0.008255	-1.857886	0.1126
X4	2.435602	2.368236	1.028446	0.3434

R-squared	0.996147	Mean dependent var	21887.97
Adjusted R-squared	0.994220	S.D. dependent var	8921.206
S.E. of regression	678.2384	Akaike info criterion	16.16605
Sum squared resid	2760044.	Schwarz criterion	16.28708
Log likelihood	-76.83025	Hannan-Quinn criter.	16.03328
F-statistic	517.0433	Durbin-Watson stat	2.941299
Prob(F-statistic)	0.000000		

Figure 4. Stereswise regression results

The equation of the stepwise regression after excluding the variable X2 is:

$$Y = -6279.636 + 1.3344X_1 - 0.0153X_2 + 2.4356X_4$$

$$(2671.798) \quad (0.3194) \quad (0.0083) \quad (2.3682)$$

$$T = (-2.3503) \quad (4.1780) \quad (-1.8579) \quad (1.0284)$$

$$R^2 = 0.9961, \bar{R}^2 = 0.9924, F = 517.0433, DW = 2.9413$$

Although the modified model has been improved somewhat, the explanatory variable X_3 is still negative, and it cannot pass it in an economic sense. To further optimize the model, the construction of exponential model is selected to repeat the above test to obtain the final equation:

$$\begin{aligned} Lny &= 8.4138 + 5.5009X_1 + 8.9104X_3 + 0.0002X_4 \\ &\quad (0.2894) \quad (3.4605) \quad (8.9442) \quad (0.0003) \\ T &= (29.0646) \quad (1.5896) \quad (0.9962) \quad (0.8182) \\ R2 &= 0.9815, R2 = 0.9722, F = 106.0676, DW = 0.9379 \end{aligned}$$

3) Self-correlation test

The LM test of the model was performed, and when the significance level was 0.05, the P-values were greater than 0.05 in the range of allowed lag orders, indicating accepting the null hypothesis that the model has no autocorrelation.

To sum up, it can be seen that the social GDP and freight volume have a great impact on the total social logistics, with a significant positive impact; the Internet coverage impact is small and almost negligible.

4. Conclusion and Suggestion

The above analysis shows that Chongqing logistics industry is greatly affected by the local social and economic development level and transportation volume (freight volume), and less affected by the popularity of the network. However, judging from the theoretical analysis, the popularization of the Internet and the rise of the information and intelligent era play a key role in the cultivation and transformation of the logistics industry. In order to actively respond to the current economic situation and the survival of the fittest within the industry, the logistics industry urgently needs to improve the quality of development and strengthen the level of specialization. To this end, this paper makes the following suggestions:

(1) We will promote the balanced development of the logistics industry

Influenced by the level of economic development level and transportation network, Chongqing logistics industry regional development balance, should pay more attention to the rational allocation of logistics resources, logistics in perfecting the center of logistics development at the same time, also should strengthen the surrounding areas and rural areas, development for appropriate logistics system, narrow the gap between urban and rural areas, gradually form urban and rural, center and edge support each other, promote the balanced development of the logistics industry.

(2) We will accelerate the informatization construction of the logistics industry

Logistics industry information construction is the current general trend, but also the key link of the development of modern logistics industry. Chongqing logistics industry needs to pay more attention to the application of various logistics technologies in the information market, increase the investment in the research and development of new technologies, encourage technological innovation, and also increase the introduction of foreign advanced logistics equipment, technology and information systems. The modern logistics enterprises must not only be closely cooperate with logistics, logistics service information system, and the supply chain enterprises must also realize e-commerce informatization, enterprise informatization is actually the major bottleneck problem of logistics socialization, to vigorously promote management talents and information talent closely cooperate, in the process of informatization business restructuring, through informatization to accelerate the enterprise industrialization, automation, improve the efficiency of the supply chain.

(3) Further enhance the environment for logistics development

On the one hand, governments and enterprises at all levels should increase the coordination and connectivity, actively give full play to the unique advantages of Chongqing municipality, reasonably break down various institutional and institutional obstacles, optimize the logistics market, and provide a good development environment for the development of the logistics industry. In the process of the coordinated development of industrial cluster and modern logistics in Chongqing, the government should guide the relevant financial fund subsidies to the construction of logistics infrastructure construction. Based on the characteristics of industrial cluster agglomeration, accelerate the construction of transportation network, promote the interconnection between logistics nodes, realize the transport capacity integration in the logistics network system, continuously expand the extended industrial cluster supply chain; improve the rationality of logistics operation infrastructure construction, connect the logistics park network, transportation hub network and industrial cluster network, and realize the efficient docking of logistics network. Expand Chongqing industrial cluster and modern logistics coordinated development and diversified business mode. With reference to (Chongqing implements several policies and measures for the implementation of western development), formulate a series of encouraging policies suitable for the development needs of Chongqing logistics industry, including project approval, land use, loan, tax, traffic control, industrial and commercial registration and other aspects. For example, priority should be given to national financial funds, foreign government loans, international financial organizations and foreign commercial loans, and corporate income tax for key logistics enterprises.

(4) Actively realize the high-quality development of the logistics industry

The key to high-quality development lies in improving the operation efficiency of the key links in the logistics industry organization and management, especially the fluency of each link and the efficiency of material operation. Innovation, as the driving force and support of high-quality development, is also what the logistics industry must focus on. All departments of the industry should focus on the shortcomings of development, solve problems and promote development with innovative thinking and methods. We should accurately find the breakthrough points and key points for the development of the industry to provide precise policies and achieve high-quality development. In addition, for cross-industry joint and open up various transportation, marketing channels have great difficulties, Chongqing should fully transform the original storage and transportation enterprises, postal enterprises, make full use of its original equipment, site and transportation, marketing channel advantage, vigorously promote the comprehensive logistics agent of the third party logistics operation mode, technical transformation, management innovation, improve its function, improve the circulation efficiency, make it become the modernization of the whole society of logistics enterprises, sharing logistics scale benefit.

(5) Step up the training of logistics talents

We will strengthen academic education. Chongqing Municipal Education Commission should actively encourage and support Chongqing colleges and universities to set up modern logistics and related colleges and junior college specialties according to the market needs for logistics talents, so as to train high and intermediate logistics management talents for Chongqing, and implement logistics vocational education. Drawing on the experience of other related industries, the qualification management system is implemented in the logistics industry, that is, according to the degree of education, logistics professional knowledge and skills, and popularize logistics knowledge. As logistics is still a new thing in China, many of the leaders of government departments and the managers of enterprises still lack of understanding of the logistics concept and the basic knowledge of logistics. Therefore, it is not only important to popularize and educate logistics knowledge for general practitioners, but also for leading cadres, especially the leading cadres of relevant government departments, so as to improve the leading cadres' understanding, understanding and attention to modern logistics. The way of universal

education can mainly invite relevant experts and scholars to give lectures, and distribute logistics knowledge popularization books to leading cadres.

To sum up, the development of the logistics industry in Chongqing should focus on open road, building platform, excellent service, promote economy and trade, xing industry, etc., depth into the industrial chain supply chain, speed up the construction of modern logistics system, build inland international logistics hub and port highland, promote the modernization of logistics industry management system and management ability, form a new situation of logistics industry modernization, provide strong support for service to build a new development pattern.

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