Proceedings of the 2nd International Conference on Management Research and Economic Development
DOI: 10.54254/2754-1169/72/20240677

Revitalizing the Economy: The Impact of Free Trade Areas on the Logistics Industry Agglomeration in Post-COVID China

Guanlin Zhu[1,a,*]

[1]*University of Southampton, University Road, Southampton,SO17 1BJ, United Kingdom*
a. 2177202348@qq.com
**corresponding author*

Abstract: This study examines the impact of free trade areas on China's logistics industry and its economy in the post-COVID era. The paper primarily focuses on key regions, utilizing the Location Quotient (LQ) method to analyze relevant trends. Notably, Hainan demonstrates substantial growth in the logistics sector, whereas Shanghai and Guangdong exhibit increased output despite declining LQ values, indicative of a shift towards services and innovation. Furthermore, logistics agglomeration promotes cross-industry collaboration, efficient value-added services, job creation, and career mobility, all of which address the economic challenges faced by China. This study emphasizes the crucial role played by free trade areas, such as Hainan, in stimulating logistics agglomeration and driving economic recovery, trade expansion, and employment opportunities in the post-pandemic landscape, thereby offering valuable insights for future growth.

Keywords: free trade areas, industrial agglomeration, logistics industry

1. Introduction

In the aftermath of the COVID-19 pandemic, the Chinese economy faces significant challenges as it endeavors to rebound from three years of sluggish growth. Consequently, the primary objective of the central government is to achieve short-term economic growth, a goal that has also received research support [1]. Notably, China's strong competitiveness in exports, stemming from high productivity and cost-efficient production, along with its absolute advantages in a wide range of goods, underscores the imperative to bolster exports as a means of attaining short-term economic growth. Initiatives like the Belt and Road, launched in 2013, have facilitated infrastructure development in participating countries and established close trading ties with China, thereby providing a conducive environment for expanding exports, an outcome corroborated by previous studies on the initiative's impact on trade relations [2]. Consequently, the ongoing expansion of free trade areas and ports interconnected with the Belt and Road initiative is an essential step for China's economic revival. Since 2013, China has progressively established 18 free trade areas and ports, with the government designating Hainan Island as a free trade area in 2018. Presently, Hainan is in the process of realizing this designation, and if all goes according to plan, it will play a pivotal role in China's future economy.

As of now, most free trade areas are situated in China's economically developed regions, drawing the presence of leading firms and multinational corporations (MNCs). Building on the findings of

DOI: 10.54254/2754-1169/72/20240677

Romanelli and Khessina [3], the localization of these industry leaders and MNCs within free trade areas prompts the emergence of smaller firms seeking to leverage the spillover effects of technology and managerial practices. Consequently, industrial agglomeration, a notable phenomenon in economic development, occurs. Industrial agglomeration refers to the clustering of interrelated firms that cooperate and compete within a specific geographical area [4].

These free trade areas are predominantly located in coastal regions, rendering them particularly advantageous for importers and exporters. Given the heavy reliance of these firms on logistics for their operations, free trade areas attract logistics firms, leading to the phenomenon of logistics agglomeration. This agglomeration encompasses companies offering various logistics services, such as transportation, warehousing, distribution, and other related services [5]. The benefits of logistics agglomeration extend to MNCs, which rely on logistics clusters for the seamless coordination of interconnected operations in the distribution of goods and services to consumers.

Consequently, the establishment of free trade areas appears to have the most significant impact on the logistics industry, and in the long term, the resultant logistics agglomeration seems to be an inevitable consequence. Moreover, as per Chhetri's research in 2014, logistics agglomeration is an evolving phenomenon that sustains regional economies and employment, especially in developed countries experiencing a decline in traditional manufacturing—a goal that aligns with the objectives of the Chinese economy. Thus, this paper's focus centers on China's free trade areas, aiming to unravel the development of agglomerations within the logistics industry and to discern the rationale underpinning the policy, as well as the anticipated impact of these free trade areas on the Chinese economy in the foreseeable future.

2. Method and Data

In order to analyze the industrial agglomeration within the logistics industry, this paper employs the Location Quotient (LQ), as introduced by Chen C and Han Y in 2014, to gauge the extent of agglomeration.

The formula for LQ is as follows:

$$LQ_i = \frac{e_i}{e} / \frac{E_i}{E}$$

Where:

LQ_idenotes the location quotient of the industry in region i.

$e_i$represents the number of employees within the industry in a specific region i.

e signifies the total employment (output) within that particular region.

Ei represents the total employment within the industry for the entire country.

E indicates the overall employment for the entire country [6].

If LQ exceeds 1, it indicates that the industry is more concentrated in that region than the national average. Conversely, if LQ is less than 1, it suggests that the industry is not meeting the local demand for a given product or service. However, an LQ value less than 1 could also be attributed to variations in the industrial structures across different regions. To enhance the accuracy of our conclusions, the paper will also make comparisons of industry values across various regions.

To calculate LQ within the logistics industry, this paper employs data related to logistics employment and total employment within specific areas.

This study draws data from the Yangtze River delta area (Shanghai) and the Pearl River delta area (Guangdong). These regions were selected due to their status as the most economically developed areas in China. Notably, six of the top ten cities in China's 2022 GDP ranking are situated in these areas, with Shanghai leading the list. These regions possess inherent geographical advantages for

DOI: 10.54254/2754-1169/72/20240677

imports and exports, alongside historical factors and policies that promote investments. Moreover, they have a long history of close interaction and exchange with the rest of the world. Consequently, the establishment of free trade areas in these regions maximizes the benefits of such policies.

Additionally, this research includes a comparison with Hainan, an island located in a coastal area with a well-developed tourism industry. However, Hainan is advised not to overly rely on tourism, particularly given the impact of the epidemic. As a result, the government has leveraged the island's unique geographical characteristics and factors, designating it as a large free trade zone to collaborate with the Belt and Road Initiative and facilitate trade. Recent policies indicate a trajectory in which Hainan could evolve into a free trade island with significant influence on the Chinese economy. In summary, these regions were selected for their representativeness in the Chinese economy and their alignment with prospective policies.

The data utilized in this paper is sourced from the National Bureau of Statistics of China [7]. The author employs Chen C and Han Y's calculation method for the past decade (2011-2021) and conducts further analysis and comparisons to provide a comprehensive view of the topic.

3. Results and Discussion

This section delves into the outcomes of the study and provides a comprehensive discussion based on data collected from the selected regions. The analysis focuses on logistics agglomeration and the development of the logistics industry over a decade, revealing noteworthy trends and variations in logistics agglomeration within free trade areas.

To initiate this analysis, the author computes the Location Quotient (LQ) for the four main regions where free trade areas are situated, spanning from 2011 to 2021. The corresponding data is presented in Table 1, showcasing the LQ values over this ten-year period. A graphical representation of these values is also depicted in Figure 1.

Table 1: The LQ of Four Regions from 2011 to 2021.

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
SHANGHAI	1.792	1.560	1.702	1.670	1.709	1.713	1.689	1.664	1.481	1.554	1.464
TIANJIN	0.924	1.112	1.012	1.027	1.076	1.082	1.125	1.071	1.165	1.208	1.239
HAINAN	1.175	1.139	1.170	1.129	1.432	1.456	1.471	1.610	1.504	1..509	1.369
GUANGDONG	1.085	1.081	0.906	0.912	0.899	0.872	0.887	0.913	0.842	0.836	0.818

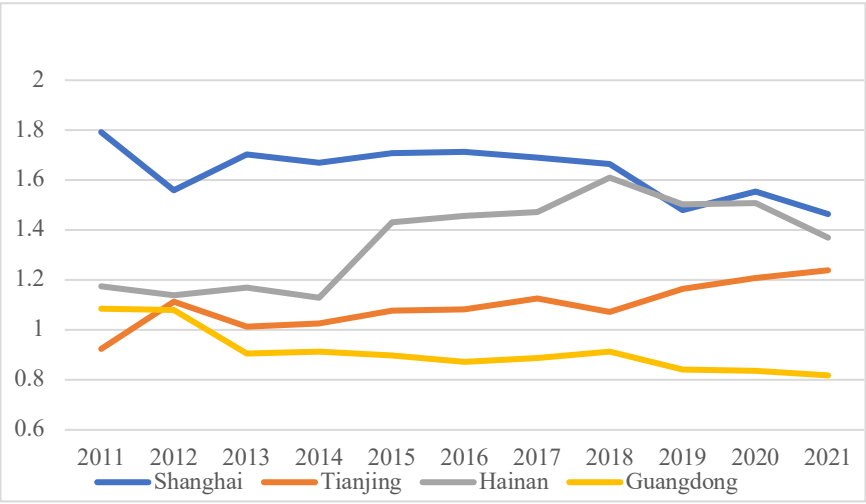

Figure 1: The LQ of Four Regions from 2011 to 2021.

DOI: 10.54254/2754-1169/72/20240677

Figure 1 provides a visual representation of the LQ trends over the ten-year period for the four cities and provinces under examination. It is evident that the average LQ level in Shanghai consistently remains notably higher than in the other three regions, despite a decreasing trend. In contrast, Hainan exhibits the most significant increase among the four regions, while Guangdong and Tianjin maintain LQ values closer to 1.

To enhance the accuracy and reliability of the analysis, this research also collects data related to the added value of transportation, warehousing, and postal services for the same period, from 2011 to 2021. These values offer valuable insights into the dynamics and development of the logistics industry, as presented in Table 2. The corresponding graphical representation is provided in Figure 2.

Table 2: Added Value of Transportation, Storage, and Postal Services in Four Regions (100M RMB).

	SHANGHAI	TIANJIN	HAINAN	GUANGDONG
2011	868.9	650.0	109.4	1889.9
2012	903.4	679.1	124.6	2100.8
2013	945.0	681.2	135.4	2237.3
2014	1059.5	685.0	150.0	2490.1
2015	1143.3	669.5	176.9	2662.7
2016	1254.6	689.2	188.9	2877.5
2017	1381.7	729.8	213.9	3166.7
2018	1616.5	748.8	224.2	3363.5
2019	1650.4	787.7	256.0	3658.0
2020	1548.0	805.0	257.6	3370.1
2021	1969.4	933.5	346.4	4054.9

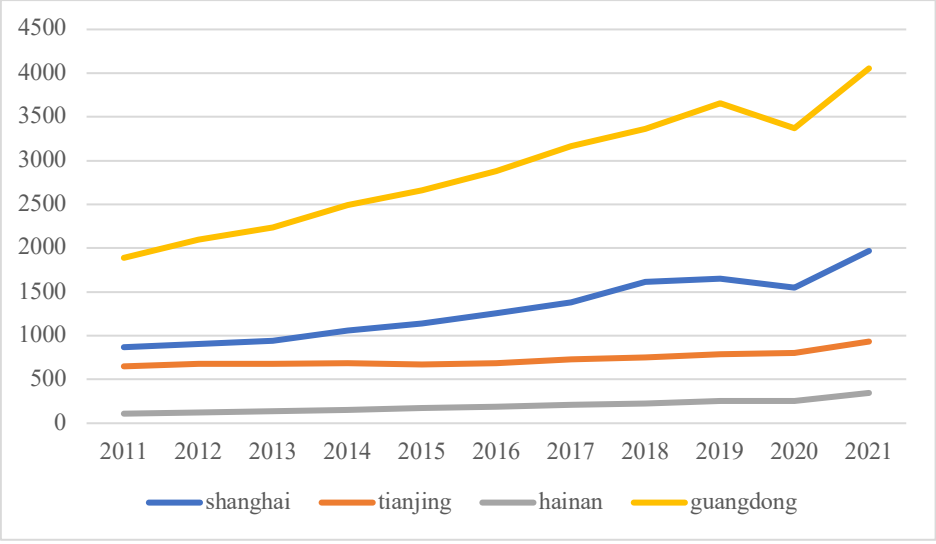

Figure 2: Added Value of Transportation, Storage, and Postal Services in Four Regions.

Figure 2 visually displays the added value of transportation, storage, and postal services in the four regions from 2011 to 2021. Notably, Guangdong exhibits the highest added value within the logistics industry, maintaining a significant difference from the other three regions. Furthermore, both Shanghai and Guangdong showcase continuous growth in the values of their logistics industries over the ten-year period.

Considering the data presented in the tables and figures above, it is evident that following the introduction of the Belt and Road Initiative and the establishment of free trade areas in Guangdong,

DOI: 10.54254/2754-1169/72/20240677

Shanghai, and Hainan, the LQ data, reflecting logistics industry agglomeration, indicates a prominent agglomeration of the logistics industry in Hainan. While the LQ values for Shanghai and Guangdong have not witnessed significant increases and, in some cases, have even decreased, the added value of the logistics industry has shown substantial growth over the past decade, particularly in Guangdong province. This suggests that, despite the absence of improvements in industrial agglomeration, the output of the logistics industry in these regions has continued to rise. This phenomenon can be attributed to the fact that Shanghai and Guangdong are situated in the most economically developed areas in China. As the Chinese economy undergoes a structural shift, these regions are increasingly focusing on the service sector, including financial services and high-tech innovation industries, such as AI and electric cars.

Drawing from previous studies and the embodiment of data and calculations, it can be posited that the establishment of free trade areas has a positive impact on promoting logistics industry agglomeration. However, it is also plausible that the level of industrial agglomeration does not necessarily increase with the establishment of free trade areas, which can be attributed to varying industrial structures and local government development policies. In summary, free trade areas generally encourage the development of the logistics industry in two key ways: by elevating the level of industrial agglomeration and by increasing the value of the logistics industry.

Building on Rivera's research, there are four significant benefits associated with logistics agglomeration. Firstly, the similarity of transportation and logistics assets across industries allows for collaboration in transportation and logistics-related activities, irrespective of the specific goods being handled [8]. This collaboration extends to firms serving different industrie. Additionally, logistics agglomeration creates conditions conducive to providing value-added services. By establishing themselves in logistics agglomeration zones, firms can efficiently postpone the provision of certain value-added services while still delivering products to customers within the stipulated time frame [5].

What's more, logistics agglomeration is instrumental in generating job growth and career mobility, two factors highly pertinent to the current Chinese economy. Given the wide array of roles within the logistics industry, the workforce has abundant opportunities for career selection and advancement. Research by Rivera and Sheffi suggests that career mobility within logistics clusters is facilitated by the industry's emphasis on practical experience and its extensive reliance on temporary workers. Furthermore, existing literature addressing the impact of industrial clustering on regional employment [9] underscores the employment opportunities offered by the diverse job functions within the logistics industry. Firms have a compelling need to establish complementary job functions in proximity to logistics agglomeration, which further reinforces the assertion that logistics agglomeration results in job growth in specific regions.

In conclusion, the role of logistics agglomeration within the economy is substantiated by existing research, as supported by the journal "The Geography of Transport Systems" [10].

4. Conclusion

In summary, this paper meticulously explores the impact of free trade areas on logistics agglomeration and their consequences on regional economic growth. The analysis is underpinned by data and calculations grounded in prior research. The findings affirm that free trade areas have the potential to stimulate logistics industrial agglomeration, and even in cases where they do not significantly increase agglomeration levels, they remain closely intertwined with the industry's economic value. However, it is crucial to delve deeper into the mechanisms through which the establishment of free trade areas enhances logistics industry agglomeration and whether this agglomeration can effectively address broader economic challenges, warranting further investigation.

From a macroeconomic perspective, the establishment of free trade areas serves as a strategic tool to alleviate challenges within the Chinese economy. Firstly, these free trade areas hold global

DOI: 10.54254/2754-1169/72/20240677

significance, as supported by [11]. They foster increased import and export activities, bolstering China's relationships with other nations, particularly its trading partners that have embraced the Belt and Road initiative. Secondly, the surge in the value of imports and exports directly contributes to GDP calculations, translating into heightened economic growth. Thirdly, the rising demand for labor in regions hosting free trade areas mitigates unemployment levels and augments incomes. This, coupled with industrial agglomeration, spurs domestic consumption, a pivotal factor in an economy confronted by deflationary risks. Lastly, the allure of free trade policies extends beyond logistics agglomeration, attracting a multitude of investors and multinational corporations (MNCs). This, in turn, enhances the investment climate and inspires confidence.

In conclusion, the establishment of free trade areas exerts a substantial impact on the Chinese economy, chiefly due to the industrial agglomeration effect. The author employs the logistics industry as a demonstrative example to analyze this phenomenon with the support of robust data and calculations. Recognizing the constructive influence of free trade areas on various industries, the author recommends the continued development of the Hainan free trade area. This region holds immense potential to become a influential force within the Chinese economy and potentially on the global trade stage.

References

[1] *Smith, J. (2020). "Chinese Economic Policy Post-COVID-19: A Focus on Short-Term Growth." Journal of Asian Economics, 45, 101823*

[2] *Duan, Y., & Chen, L. (2018). "The Belt and Road Initiative and Its Impact on Global Trade." World Development, 110, 22-32.*

[3] *Romanelli, E. and Khessina, O. (2005), "Regional industrial identity: cluster configurations and economic development", Organization Science, Vol. 16 No. 4, pp. 344-358.*

[4] *Porter, M. (2000), "Location, competition, and economic development: local clusters in a global economy", Economic Development Quartely, Vol. 14 No. 1, pp. 15-42.*

[5] *Rivera, L., Sheffi, Y., & Welsch, R. (2014). Logistics agglomeration in the US. Transportation Research Part A: Policy and Practice, 59, 222–238. https://doi.org/10.1016/j.tra.2013.11.009*

[6] *Chen, C., Han, Y. H., & Huang, Y. C. (2014). Study on the factors influencing the logistics industry agglomeration. Applied Mechanics and Materials, 505–506, 935–939. https://doi.org/10.4028/www.scientific.net/AMM.505-506.935*

[7] *National Bureau of Statistics of China. (2023). http://www.stats.gov.cn*

[8] *Rivera, L., Gligor, D., & Sheffi, Y. (2016). The benefits of logistics clustering. International Journal of Physical Distribution and Logistics Management, 46(3), 242–268. https://doi.org/10.1108/IJPDLM-10-2014-0243*

[9] *Chhetri, P., Butcher, T. and Corbitt, B. (2014), "Characterizing spatial logistics employment clusters", International Journal of Physical Distribution and Logistics Management, Vol. 44 No. 3, pp. 221-241.*

[10] *Rodrigue, J.-P., Comtois, C., & Slack, B. (2019). Transport, energy and environment. The Geography of Transport Systems, 288–310. https://doi.org/10.4324/9781315618159-8*

[11] *UNCTAD (United Nations Conference on Trade and Development). (2020). "World Investment Report 2020: International Production Beyond the Pandemic." Retrieved from https://unctad.org/system/files/official-document/wir2020_en.pdf*