

A CURRENT STATUS OF THE DEVELOPMENT OF CHINA'S LOGISTICS SMALL AND MEDIUM ENTERPRISES BASED ON CITESPACE

^[1] FUYUAN YANG, ^[2] BOONSUB PANICHAKARN

^[1] FACULTY OF LOGISTICS AND DIGITAL SUPPLY CHAIN, NARESUAN UNIVERSITY, ^[2] FACULTY OF LOGISTICS AND DIGITAL SUPPLY CHAIN, NARESUAN UNIVERSITY
EMAIL: ^[1] yangf62@nu.ac.th, ^[2] boonsubp@nu.ac.th

Abstract— Small and medium enterprises (SMEs) are an important mechanism for economic growth in the current and new era, the technological innovation, and the main driving force for high-quality industrial development. This paper reviews the current status of the development of China's logistics SMEs from 2012 to 2024, and uses CiteSpace software for visualization analysis. The analysis shows that the current development of China's logistics SMEs mainly focuses on performance and management. According to the visualization analysis results of literature research hotspots and cutting-edge trends, future research will involve digital transformation and other directions.

Index Terms—Logistics SMEs; CiteSpace; Performance; Management; Digital Transformation; Visual Analysis

I. INTRODUCTION

In the contemporary global economic system, small and medium-sized enterprises play a vital role in the industrial structure of developed and developing countries [1].

As a key driver of economic vitality, small and medium-sized enterprises have demonstrated strong adaptability and innovation capabilities, which not only promote the dynamic optimization of the global value chain, but also provide important support for the sustained growth of the local economy. Whether in promoting employment, cultivating technological innovation, or promoting social equity and regional economic balance, small and medium-sized enterprises have demonstrated their indispensable functions. At the same time, they have played an important role in improving human welfare, improving social development indicators and achieving sustainable development goals, and constitute the most vital component of the national economy [2, 3].

Over the past 40 years of reform and opening up, China's economy has achieved tremendous development and has undergone earth-shaking changes. Today, China's economy has entered a stage of high-quality development. China has built the world's largest logistics market, with container throughput, express delivery business volume and cargo turnover ranking first in the world. The logistics industry has gradually become an important industry supporting the national economy. However, the uneven distribution of resources in various regions of China, the gap in development levels and the problem of insufficient development still need to be further addressed [4].

China's economy and society are undergoing an important transition from high-speed growth to high-quality development. Against this background, small and medium-sized enterprises, including logistics small and medium-sized enterprises, as the basic units with vitality in the economic system, their development status and trends have become key issues that need urgent attention in research and practice [5].

The logistics industry is a basic, strategic and leading industry that supports the development of the national economy. It runs through all aspects of production, distribution, circulation and consumption in economic circulation and people's livelihood security. The high-quality development of the logistics industry is an important guarantee for promoting high-quality economic development and satisfying people's pursuit of a better life [6].

The logistics industry is a basic, strategic and leading industry that supports the development of China's national economy. After more than 40 years of reform and opening up, China's economy has developed rapidly and achieved great success. China's logistics industry has also developed rapidly and achieved great success [7].

Since China first introduced the concept of modern "logistics" to China in 1978, after more than 40 years of development, many indicators of China's logistics industry have led the world. In 2013, the scale of China's logistics market surpassed that of the United States for the first time, becoming the world's largest. At the same time, China has established a highly open logistics market. However, the development of China's logistics industry is unbalanced. Generally speaking, the eastern region has developed faster and better, the central and western regions have developed slower and weaker, and urban logistics has developed better than rural logistics [8].

Although China has become a major logistics country, it is not yet a strong logistics country and its logistics performance is not ideal. In terms of logistics performance, there is a certain gap between China and developed countries. The total logistics costs of the whole society from 2013 to 2023 show that although China's total logistics costs of the whole society as a proportion of GDP have declined, they are still higher compared with developed countries. There are various problems in the overall innovation ability of the logistics industry, the level of logistics

internationalization, a standardized and orderly logistics market, unsustainable logistics and safety issues, logistics emergency capabilities, logistics human resource guarantees, logistics systems, mechanisms, laws and policies, etc. question [9].

In recent years, in order to promote the high-quality development of China's logistics SMEs, many domestic scholars have conducted in-depth investigations and studies on their development status. These studies reveal the various problems faced by logistics SMEs in the process of development and put forward corresponding solutions [10].

This paper mainly reviews the relevant research literature on the development of China's logistics SMEs, summarizes the current status and characteristics of research on the development of China's logistics SMEs, uses CiteSpace software for visual analysis, determines research hotspots and trends, and discovers the direction and focus of future research in the field of development of China's logistics SMEs.

II. CURRENT STATUS OF SMALL AND MEDIUM LOGISTICS ENTERPRISES

A. *China's definition of logistics Small and Medium Enterprises*

The latest National Standard Logistics Terminology of the People's Republic of China (GB/T 18354-2021) released in 2021 also defines the definition of logistics enterprises. Logistics enterprises refer to economic organizations that are engaged in logistics business design and system operation within the scope of basic logistics functions, have information management systems suitable for their own business, implement independent accounting, and bear civil liability independently.

Chinese logistics companies are divided into three types: transportation companies, warehousing companies, and comprehensive service companies based on their different business priorities. As for small and medium-sized enterprises, China divides them into three categories: medium-sized enterprises, small enterprises and micro-enterprises. The grading of small and medium-sized enterprises is mainly based on the collection, analysis, and determination of relevant evaluation indicators such as the current relevant employees of the enterprise, the working capital and fixed assets and other related assets owned by the enterprise, and the total annual operating income of the enterprise [11].

Since the country has not clearly defined small and medium-sized logistics enterprises, this study refers to the "National Economic Industry Classification and Code" and the relevant regulations and classification standards for small and medium-sized enterprises. Small and medium-sized logistics enterprises are quantified as follows: those with less than 1,000 employees and operating income less than 300 million yuan are small, medium and micro-sized logistics enterprises.

B. *The status of the development of China's logistics Small and Medium Enterprises*

Modern logistics connects production and consumption, highly integrates and integrates transportation, warehousing, distribution, distribution, information and other service functions. It is an important support for extending the industrial chain improving the value chain, and building a supply chain. It plays an important role in building a modern circulation system and promoting the formation of a supply chain. It plays a leading, basic and strategic role in strengthening the domestic market, promoting high-quality development, and building a modern economic system [12].

China's logistics market is huge and plays an important role in the national economy. Relevant data show that the logistics industry contributes about 15% to the gross domestic product (GDP). In recent years, my country's logistics industry has made significant progress in overall development level and service quality, and the logistics network layout and transportation infrastructure have been continuously optimized. At the same time, the widespread application of emerging technologies and digital tools has greatly improved logistics operation efficiency and service capabilities, and accelerated the modernization and intelligent transformation of the industry [13].

2022 is a year of historic significance for the development of China's modern logistics. China released the "14th Five-Year Plan for Modern Logistics Development", which is China's first national five-year plan in the field of modern logistics. The plan makes a series of innovative, forward-looking, and operable strategic arrangements for the construction of China's modern logistics system, marking that China's logistics industry has entered a new stage of system integration, transformation and development, and functional improvement [14].

The plan points out that in terms of development foundation, China's modern logistics has shown six characteristics: continuous improvement in economies of scale, accelerated structural adjustment, improved quality and growth rate of resource integration, science and technology promoting innovative development, international logistics expansion, and improved business environment.

China has become the world's largest logistics market. After more than 40 years of reform and opening up and sustained and rapid development, China has become a globally influential logistics power and the world's largest logistics market. In 2013, China's logistics market surpassed the United States for the first time and became the largest in the world. In 2023, China's total value of goods operated by logistics has increased from 197.8 trillion yuan in 2013 to 352.4 trillion yuan [9].



Figure 1 : China's total value of goods operated by logistics and year-on-year growth rate

Source: The author compiled based on the website of China Federation of Logistics and Purchasing and China Logistics Information Center. Drawn by the author.

Figure 1 shows the changes in the scale and growth of China's logistics market. This shows that the development trend of China's logistics market is very good.

According to the fourth economic census, there are nearly 600,000 legal entities and more than 5.8 million individual operators in China's transportation, warehousing and postal industries, with a total of more than 6 million logistics-related market entities. Among them, small, medium and micro enterprises account for more than 90% of legal entities [15].

The study shows that the level of logistics development in eastern China varies significantly among provinces and cities. Specifically, the logistics development levels of Hebei, Fujian, Tianjin, Shandong and Zhejiang provinces can better meet the needs of local economic and social development. Based on the overall situation analysis, the 11 provinces and cities in the eastern region can be divided into the following three categories: provinces and cities with relatively high levels of logistics development include Hebei, Fujian, Tianjin, Shandong and Zhejiang; provinces and cities with good levels of logistics development include Liaoning, Guangdong, Jiangsu and Beijing; and provinces and cities with further improvement in logistics development levels include Shanghai and Hainan [4].

The overall development of logistics in western China is on the rise, and the logistics development levels of the 12 provinces (autonomous regions and municipalities) have formed three relatively obvious echelons. The first echelon includes Chongqing, Sichuan, Shaanxi and Inner Mongolia, which have relatively high levels of logistics development; the second echelon is Guangxi and Ningxia, which have medium levels of logistics development; the third echelon is the areas where logistics development is in urgent need of improvement, including Yunnan, Guizhou, Qinghai, Xinjiang, Tibet and Gansu [16].

Over the past 40 years, the development of China's modern logistics can be roughly divided into three stages: Learning and introduction period (1978-1984) During this period, the concept of "logistics" was first introduced to China and gradually began to develop. Exploration period (1984-2001) During this period, China began to conduct research and application practices in the field of logistics, exploring logistics models and theories suitable for local needs. Development period (2001 to present) Since 2001, China's modern logistics has entered a stage of rapid development, with the industry scale and technical level continuously improving, and development is still continuing to deepen [17].

Slow efficiency growth is a problem faced by the logistics industry under the traditional model. To solve this problem, we must move towards high quality and modernization [18].

The research points out that the current status of modernization development of China's logistics industry and logistics enterprises is mainly reflected in three aspects: first, the scale and efficiency of the logistics industry have maintained a good growth trend for many years; second, innovation-driven development has become a significant trend in the modernization development of logistics enterprises; third, my country's logistics industry and logistics enterprises are moving towards a new stage of high-quality development [19].

The operating pressure on logistics companies continues to increase, and their revenue profit margins are low [9]. Research shows that the main constraints facing the strategic development of China's modern logistics enterprises include the following aspects: the national policy support system is still imperfect, there is an imbalance in the allocation of logistics-related resources, especially small and medium-sized logistics enterprises find it difficult to adapt to the rapid development needs of the information age, and at the same time, the strategic linkage mechanism between modern logistics enterprises has not yet been formed [19].

Survey data show that among the main difficulties currently faced by logistics enterprises, the top three are fierce market competition (78.6%), high operating costs (61.96%) and insufficient market demand (43.24%). By business area, the primary challenge in areas such as road freight, water freight and freight forwarding is fierce market competition; urban distribution and express delivery are mainly affected by high operating costs. At the same time, most areas generally reflect insufficient market demand, which has become one of the key factors restricting the development of the industry [20].

The research believes that the main problems affecting the high-quality development of modern logistics enterprises are as follows: the policy environment and basic conditions for the high-quality development of modern logistics enterprises need to be improved, the supply-side structural reform of modern logistics enterprises needs to be continuously deepened, some logistics enterprises have weak technological innovation capabilities, and the overall international competitive advantages of logistics enterprises are insufficient [21].

The study believes that the main problems faced by China's logistics industry in its development process include: the limitations of market demand restrict the further expansion of the industry scale; the relatively low service quality and management level affect the overall operating efficiency; the high logistics costs put pressure on the profitability and competitiveness of enterprises; the shortage of professional logistics talents restricts the industry's innovation and technological progress; in addition, the cargo supervision mechanism is still imperfect and it is difficult to fully meet the requirements of modern logistics efficiency and safety [22].

According to the latest survey, China's small and medium-sized logistics companies are currently facing four major problems: 1) The biggest problem faced by more than half of the companies is the rapid increase in operating costs, including the continued increase in cost pressures such as energy, manpower, land, and capital. The second biggest problem is that the pessimistic economic situation has led to insufficient market demand and increased uncertainty in the survival of companies. The third biggest problem is insufficient funds and difficulty in financing. The fourth problem is heavy tax burden, low price level, and labor shortage [15].

III. VISUALIZATION ANALYSIS OF THE DEVELOPMENT OF CHINA'S LOGISTICS SMEs BASED ON CITESPACE

This paper uses CiteSpace software to conduct a visual analysis of relevant literature in the field of development of China's logistics SMEs. Its theory is co-citation analysis theory and path-finding network algorithm. By using visual knowledge graph analysis, we can derive research hotspots and cutting-edge trends in related fields [23].

The literature search used the web of science (WoS) as the database, "logistics SMEs" as the keyword, the literature search time was from 2012 to 2024, and the search condition was "precise". The search scope was all journal articles and dissertations, and a total of 357 documents were screened out. After deleting invalid documents such as subject guidelines, conference information, and professional introductions, 339 documents were finally determined as research samples.

○ Research hotspots based on keyword co-occurrence

Research hotspots are research topics that scholars pay close attention to in a specific field. Their notable feature is that the number of related documents increases rapidly in a certain period of time. Keywords, as the core and summary of documents, usually appear repeatedly in documents in a specific field. Therefore, this paper uses Citespace software to analyze the keywords of journal documents related to small and medium-sized logistics enterprises and generates a keyword co-occurrence clustering diagram (as shown in the figure).

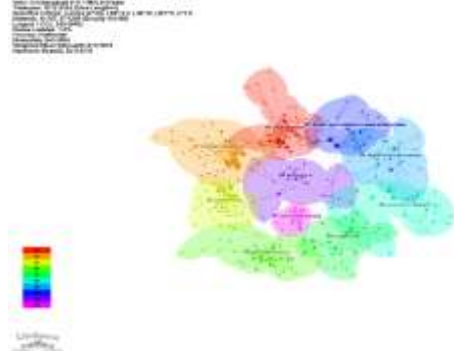


Figure 2: Keyword co-occurrence clustering diagram

As can be seen from the figure, the clustering in the field of small and medium-sized logistics enterprises is mainly divided into two parts. On the one hand, it is mainly the development status of the logistics industry, which is considered from the perspective of the logistics industry as a whole, such as "industry", "industrial cluster", "small and medium-sized logistics enterprises" in the keyword co-occurrence cluster diagram; on the other hand, it is mainly small and medium-sized logistics enterprises, not only logistics enterprises themselves, but also other technological applications, such as "digital transformation", "small enterprises" and "innovation" in the keyword co-occurrence cluster diagram.

○ Analysis of research hotspots on the development of China's logistics Small and Medium Enterprises based on keyword co-occurrence characteristics

By selecting the node type of CiteSpace software as a keyword, we can get the keyword co-occurrence map shown in Figure . The results of this map show that Chinese scholars' research on the development of China's logistics SMEs is reflected in the following aspects: First, the main research objects are "small and medium-sized enterprises", "performance" and "management"; Second, in the content of the research, most of them focus on the

impact of models, determinants and framework structures on the future development of enterprises, raise relevant questions, analyze and provide solutions; Third, there are more studies on the macro perspective than on the micro perspective, and fewer studies consider the relevant influencing factors of enterprise development from the perspective of enterprises (Huo, 2023).



Figure 3: Co-occurrence map of keywords in the research on the development of China's logistics SMEs

CiteSpace software was used to perform keyword analysis on the selected literature. The co-occurrence map of keywords in the research on China's logistics SMEs is shown in the figure. There are 357 nodes, 1239 links, and the network density value is 0.0195.

○ *Analysis of research trends on the development of China's logistics Small and Medium Enterprises based on the characteristics of keyword emergence*

Through keyword clustering analysis, we can effectively identify the emergence of keywords, and reveal the hot spots and development trends of research fields in a specific period based on the intensity and duration of the emergence. Therefore, this paper uses Citespace software to perform keyword emergence analysis on literature related to small and medium-sized logistics enterprises, and the results are shown in the figure.

The keyword emergence map of research on small and medium-sized logistics enterprises shows a total of 15 emerging keywords, including performance, patterns, collaboration, model, corporate social responsibility, firm performance, service, access, bankruptcy prediction, system, financial distress, quality, logistical studies, export performance, and supply chain.

The emergent features of keywords represent the frontier direction of the research field. Here, the burst term function in Citespace is used to analyze the emergent features of keywords, as shown in Table 2. In the corresponding year of burst term analysis, “_” indicates that the keyword has not appeared, “■” indicates that the keyword has appeared but not emerged, and “■” indicates that the keyword has emerged.

Top 15 Keywords with the Strongest Citation Bursts

Keywords	Year	Strength	Begin	End	2012 - 2024
performance	2013	2.25	2013	2014	■
patterns	2014	2.13	2014	2017	■
collaboration	2015	2.08	2015	2018	■
model	2016	3.32	2016	2019	■
corporate social responsibility	2012	2.96	2017	2018	■
firm performance	2013	2.86	2018	2019	■
service	2019	2.14	2019	2020	■
access	2019	2.12	2019	2021	■
bankruptcy prediction	2016	1.9	2020	2021	■
system	2019	1.88	2020	2021	■
financial distress	2020	1.87	2020	2021	■
quality	2021	2.54	2021	2022	■
logistics	2016	2.4	2021	2022	■
export performance	2022	2.18	2022	2024	■
supply chain	2018	1.81	2022	2024	■

Figure4: Keyword emergence of small and medium-sized logistics enterprises

By analyzing the emergence time and intensity of the keywords in the table, we can conclude that: The keywords that appeared earlier are "corporate performance", "corporate social responsibility" and "cooperation"; The keywords with emergence intensity greater than 2 are "performance", "mode", "cooperation", "model", "corporate social responsibility", "company performance", "service", "right of use", "quality", "logistics" and "export performance", among which "performance" and "corporate social responsibility" appear earlier.

IV. CONCLUSION AND OUTLOOK

From the perspective of scientometrics, this paper uses Citespace software to visualize and analyze the journal articles on the subject of small and medium-sized logistics enterprises published in the WOS database from 2012 to 2024. The following three conclusions are drawn:

The number of articles on the subject of small and medium-sized logistics enterprises has been increasing since 2012, with a cumulative number of more than 357 articles. This shows that small and medium-sized logistics enterprises are still a key research field, but there is a relative lack of valuable articles.

At present, the research on the development of China's logistics SMEs mainly focuses on performance, management and other aspects. According to the visualization analysis results of literature research hotspots and cutting-edge trends, future research will involve digital transformation, high-quality development and other directions.

Based on the visualization analysis of literature on the development of China's logistics SMEs, CiteSpace found that the research on the development of China's logistics SMEs is continuously updated and improved. The keyword emergence characteristics show that the future research direction will involve digital transformation, digital technology adoption, high-quality development and other directions. The problem that needs to be solved urgently is to reduce costs and increase efficiency, find new development strategies, and achieve high-quality development.

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