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Identification of Factors Influencing the Construction of Supply Chains in China's Transport and Logistics Systems

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ABSTRACT

The purpose of the study is to find approaches to identifying factors influencing the construction of supply chains in China's transport and logistics systems, which is becoming especially relevant in the context of the country's "new economy" dictated by the active development of digital technologies, e-commerce and changing consumer behavior. Based on a multidimensional analytical review of scientific sources, the classification of internal and external factors affecting supply chain management in China's transportation and logistics systems is substantiated. The author's configuration of these factors is proposed, taking into account regional differences, and the structure of the factor field is formed. The result of the research from a scientific point of view was an assessment of the functional effectiveness of supply chain management from the perspective of traditional factors such as natural resources, capital, labor and land, as well as transformational and transactional, including human (skills, qualifications, knowledge), scientific and technological (research, innovation, technology) and material (infrastructure, equipment, materials) factors. The theoretical significance of the study lies in the formation of a configuration of internal and external factors affecting supply chain management in China's transport and logistics systems, taking into account regional differences. The results of the work include the development of recommendations aimed at optimizing logistics processes, diversifying risks and adapting to changing conditions in the global market.

Keywords: supply chain management; identification of factors; classification; external factors; internal factors; transportation and logistics systems; China

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INTRODUCTION

Digitalization of transport and logistics supply chains (SCs) in order to increase the efficiency and transparency of logistics processes is one of the priority areas for the development of the Chinese economy [1]. In addition to social and production issues, in the course of implementing the "dual circulation" strategy, the Chinese expert community draws attention to the need for the effective development of transport logistics in general and internal supply chains in particular, which allows for greater connectivity and efficiency of the country's domestic market [2].

According to Chinese expert He Dengcai, the integration of logistics into the digital ecosystem is of great importance both for meeting society's needs for quality logistics services and for improving living standards in general. In turn, Professor Dongbei Wang Xuhui emphasizes the importance of integrating digital technologies into the logistics industry and using the "online Silk Road" to strengthen ties between Chinese regions [3, p. 16].

However, in the context of global economic crises, political instability and sanctions pressure, the transport and logistics systems of the PRC are faced with certain factors that significantly affect their functionality and sustainability. In particular, sanctions aimed at restricting international trade and economic relations serve as additional challenges for them and have a certain impact, creating instability and breaks in supply chains.

However, restrictions on exports and imports can cause supply problems (affecting production processes and global availability of goods), while difficulties with banking procedures, the use of alternative currencies and changes in customs regulations create additional complexities in financial transactions, affecting on the efficiency of logistics operations.

In order to identify factors influencing the construction of supply chains in transport and logistics systems in China, it is proposed:

a) review existing methodological approaches to solving this problem;

b) systematize internal and external factors influencing supply chain management in transport and logistics systems;

c) propose the author's configuration of these factors and their assessment, taking into account regional differences within the country.

The research methodology involves the use of analytical and statistical, as well as general scientific methods (generalization and analogy, comparison, juxtaposition, interpretation, etc.), as well as taking into account the opinions of experts in the field of logistics and international relations and the results of empirical research carried out by the author. In addition, they reviewed strategic planning documents of the Chinese Government, scientific publications by economists, reference and analytical materials. All this ensured the scientific validity of the work carried out and the reliability of its results.

The scientific novelty of the study lies in the author's proposal of a configuration of factors influencing supply chain management in China's transport and logistics systems, taking into account the differences inherent in the country's regions.

METHODOLOGICAL APPROACHES TO IDENTIFYING FACTORS INFLUENCING THE CONSTRUCTION OF SUPPLY CHAINS

The work of a number of specialists is devoted to the study of factors influencing the construction of SC in transport and logistics systems, namely the analysis of their efficiency and sustainability. For example, article [4] talks about the impact of risk management

Table 1

Scientific approaches to the identification of factors influencing the construction of supply chains

Approach	Representatives	Description
Systematic approach	Donald Bollu Hull Lou, Martin Christopher	Considers supply chains as a complex system consisting of interconnected elements and processes
Strategical approach	David Simchi-Levi Sander de Liger, Robin Lamberson	Focuses on strategic supply chain management and identifies strategy drivers
Technological approach	Howie Lee, James Lapidus, Robert Handfield	Focuses on technological innovation and its impact on supply chain management
Client-oriented approach	Mark Barnes, Christopher Sauer Daniel King	Focuses on customer needs and requirements and analyzes factors that satisfy their needs

Source: compiled by the author.

on the resilience and vulnerability of supply chains. The publication [5] identified problems and challenges associated with risk management in SCs in the automotive and electronics industries. The results presented by the authors are based on an analysis of the sources of risks, as well as methods of managing them and measures to reduce risks in these industries. T.N. Odintsova and I. Yu. Yaguzinskaya consider methodological issues of systematization of risks in logistics processes when building supply chains, their identification, assessment of the reasons for their occurrence and methods of minimization [6], and Yu.A. Ilyina studies the influence of the macroenvironment on the supply chain, in particular, under conditions of economic restrictions [7].

The contribution of Chinese scientists to the study of this problem is significant. Thus, Y. Zhang analyzed both the practical experience of the policy of reform and opening up, as well as the limiting factors and main components of SC management in transport and logistics systems [8], and Y. Caping analyzed global trends and management challenges, as well as its inherent limitations and key elements [9]. The works of H. Zhang [10] are aimed at taking into account the infrastructure and technological aspects of the country's transport and logistics systems; D. Zhao [11] identified factors that hinder the effective operation of logistics companies in China.

Foley & Lardner LLP has focused on optimizing logistics processes and resources in SC management.[1]

If we talk about scientific approaches to identifying factors influencing the construction of supply chains, then among them there are 4 main ones (*Table 1*). They are interconnected and can be combined.

In the context of the identified approaches, factors can be classified according to various criteria, including their nature or origin, including [12, 13]:

1. Structural factors related to the basic structure and configuration of the supply chain: geographic location, number and location of warehouses, production facilities

[1] How has supply chain management changed due to COVID-19? Herz Corporation (official website). URL: https://herzcorporation.com/ru/news/supply-chain-management-shifts-covid-19/

and technical infrastructure. For example, a certain warehouse capacity or physical logistics capabilities may be structural limiting factors.

2. Commercial factors related to customer requirements, seasonal fluctuations in demand, market conditions or product quality. For example, changes in demand for a certain product or customer conditions regarding delivery times can become commercial limiting factors.

3. Operational factors associated with activity processes in the SC, such as supply planning processes, inventory management, delivery logistics, etc. Operational limit factors may include production time constraints, delivery delays, or resource shortages.

4. Functional factors related to the interaction between different functional units within the company or partners in the supply chain. These include coordination between sales, production and logistics departments, information exchange and synchronization of actions. Lack of coherence in the activities of departments within the organization or when interacting with partners can become a functional limiting factor.

Optimizing your supply chain structure by taking into account the above factors will achieve optimal SC management, provide a competitive advantage and satisfy customer needs.

Some experts [14, 15] classify factors of the internal and external environment of supply chains, taking into account uncertainty and risk:

1. System complexity: SCs include many interconnected elements, processes and actors. Difficulties may arise due to the large number of participants, the variety of goods and services, and various processes and stages. Managing such a system requires special approaches and methods.

2. Uncertainty and stochasticity of parameters such as demand, transport conditions, prices, customs procedures, etc. All this can create problems and lead to uncertainty in the planning and management of the SC.

3. Conflicting Interests of Entities: Supply chain participants — suppliers, manufacturers, distributors, retailers, and others — have their own unique interests, strategies, and priorities, which can lead to a number of conflicts and difficulties in the collaboration process.

4. Supply chain dynamism: the ability to adapt and respond to constantly changing environmental conditions, such as changes in legislation and standards, globalization and geopolitical factors, market and consumer demands, technological innovation, etc., which allows maintaining a high level of business flexibility processes in the SC and invest in technologies and strategies that promote adaptation.

For a more detailed understanding of the role of limiting factors in CPU management, we can divide them into geographical and level ones.

It is worth noting that the concept of "limit factor" (in the context of supply chain management) is a management category. This concept is used to refer to limiting or slowing factors that can affect the efficiency and performance of the SC [16].

The level structure of limit factors includes:

1. Global limit factors. Represent a key level of constraint factors that can significantly impact global supply chain management (including supplier selection, delivery strategies and overall coordination). These include: political stability, international trade agreements, the global economic situation, trends and changes in consumer demand, the competitive environment and innovations in world markets.

2. National limit factors. They include various aspects of political, economic, legal and socio-cultural conditions that influence the management of SC in a particular country. For example, legal requirements, tax policy, tariff barriers, infrastructure, availability of resources, etc.

3. Regional limit factors. They play a key role in shaping and defining supply chain management strategies in specific regions and represent various aspects (geographical features, climatic conditions, cultural differences, the specifics of local markets, including consumer preferences, competitive environment and local trading practices, regional infrastructure). These factors can vary significantly from one region to another and influence the choice of warehouse locations and transport routes, inventory management strategies and other aspects of SC management.

4. Local limit factors. These are location-specific conditions and can significantly impact the effectiveness of supply chain management at the city, district, or even site level. These include the availability of transport infrastructure, the availability of qualified personnel, local legal and regulatory requirements, cultural and linguistic characteristics of the participants in the SC. All this may require adaptation of communication and management approaches for effective collaboration [17, 18].

In addition to these, there are many factors in various areas that can significantly influence supply chain management, such as those related to logistics, technology, market competition, legislation, finance and other aspects [19, 20]. Considering additional factors can help create a more comprehensive and adaptive strategic approach to SC management.

Summarizing the analysis of studies and reviews in the field of supply chain management in transport and logistics systems, we can conclude that most experts emphasize the need for a comprehensive analysis of limit factors affecting supply chain management (*Table 2*).

For systematization and analysis, the identified factors in SC management can be classified into main categories (*Table 3*).

FEATURES OF SUPPLY CHAIN MANAGEMENT IN CHINA

In China, as in other countries, there are a number of unresolved problematic issues related to supply chain management in transport and logistics systems. Communications and information technologies play an important role in the development of the country's "new economy" and its functioning, the emergence of which has created new opportunities for entrepreneurship, e-commerce and information exchange [21, 22].

National characteristics of China associated with new technologies include the following aspects:

- Scale and density of Internet users. China is the world's largest Internet market, which creates great opportunities for the development of e-commerce, online platforms and digital services.
- Mobile communications. Mobile Internet plays a key role in transforming various aspects of daily life and business in the country and serves as a tool for mobile commerce, online payments and other mobile services.
- Digital platforms and e-commerce. China has developed various digital platforms, such as Alibaba (Taobao, Tmall), JD.com, Pinduoduo, etc., which provide infrastructure for e-commerce, facilitate interaction between sellers and buyers, and offer various services and business opportunities.

Table 2

Factors influencing supply chain management in transportation and logistics systems

Criterion	Limit Factor	Key Factors Affecting Supply Chain Efficiency
1. Transport infrastructure	Insufficient development of the transport network, limited accessibility and capacity of ports, road and railway infrastructure	Availability of a well-developed and efficient transport infrastructure, quality of roads, ports, warehouses and other logistics facilities
2. Customs procedures and regulation	Difficulties and delays in customs clearance, certification and licensing requirements, changes in customs legislation, restrictions on the import/export of goods can limit the smooth movement of goods through supply chains	The development of efficient and automated customs clearance systems can reduce delays at border crossings. The introduction of electronic systems for declaration and exchange of information between customs and supply chain participants allows speeding up processes and increasing transparency
3. Geographical features	Long distances, difficulty of delivery to remote areas, inaccessibility of certain regions	Investments in the development of transport networks (including roads, railways, ports and airports, improving the quality and efficiency of transport infrastructure can improve accessibility to remote areas and facilitate faster and more reliable delivery of goods
4. Technologies and information systems	Insufficient use of modern technologies and information systems in supply chain management can limit automation and process optimization	The use of modern information technologies and management systems, such as inventory management systems (WMS), cargo tracking, etc., helps to increase efficiency and transparency in supply chain management
5. Partners, suppliers and contractors	Imperfections in the work of suppliers and partners, problems with the quality of goods or services, ineffective cooperation	Collaboration and information sharing among supply chain participants promote coordination and collaborative problem solving
6. Financial aspects	Constraints on capital availability, high financial costs, exchange rate instability	Developing a strategy to diversify funding sources can reduce dependence on limited capital availability. Implementing effective financial systems and processes, such as automated accounting and payment systems, helps manage financial risks and reduce transaction costs

Source: compiled by the author.

Table 3

Classification of internal and external factors affecting supply chain management in transport and logistics systems

Factor	Description
External factors	
Economic factors	Macroeconomic situation, inflation, exchange rate fluctuations, interest rates, unemployment rate, etc.
Political and legal factors	Political stability, legislative requirements, tax policy, international documents, etc.
Sociocultural factors	Demographic changes, social and cultural trends, consumer preferences, safety standards and ethical requirements
Technological factors	Technology development, digitalization, automation, Internet of Things (IOT), artificial intelligence (AI) and other technological innovations
Internal factors	
Strategic factors	Strategic planning, goals and mission of the organization, selection of market segments and positioning, competitive advantages, etc.
Organizational factors	Organizational structure, management system, distribution of responsibilities and roles, coordination and communication within the organization
Logistics factors	Inventory management, warehouse activities, transport, packaging, transportation and delivery, coordination and synchronization of logistics processes, other aspects of logistics
Informational factors	Availability and quality of information, information management systems, data exchange within and outside the supply chain, analytics and forecasting

Source: compiled by the author.

Table 4

Breakdown of China's regions to assess the level of supply chain management in the country's transportation and logistics networks

Region	Peculiarities
Northern China	Developed infrastructure and high level of technological maturity. Dense network of production and logistics centers. High demand for digital solutions for supply chain management
Northeast China	Historical industrial regions with potential for innovation. Availability of advanced manufacturing and technology companies
Eastern China	Availability of technology centers and innovations. Advanced international connections and diversity of economic sectors influencing the specificity of supply chains in this region
South China	Leading technology centers focused on innovation and digital transformation
Central China	Emerging regions with potential to improve supply chain management systems using digital technologies
Southwest China	Unique regions with digitalization needs to manage complex supply chains

Source: compiled by the author.

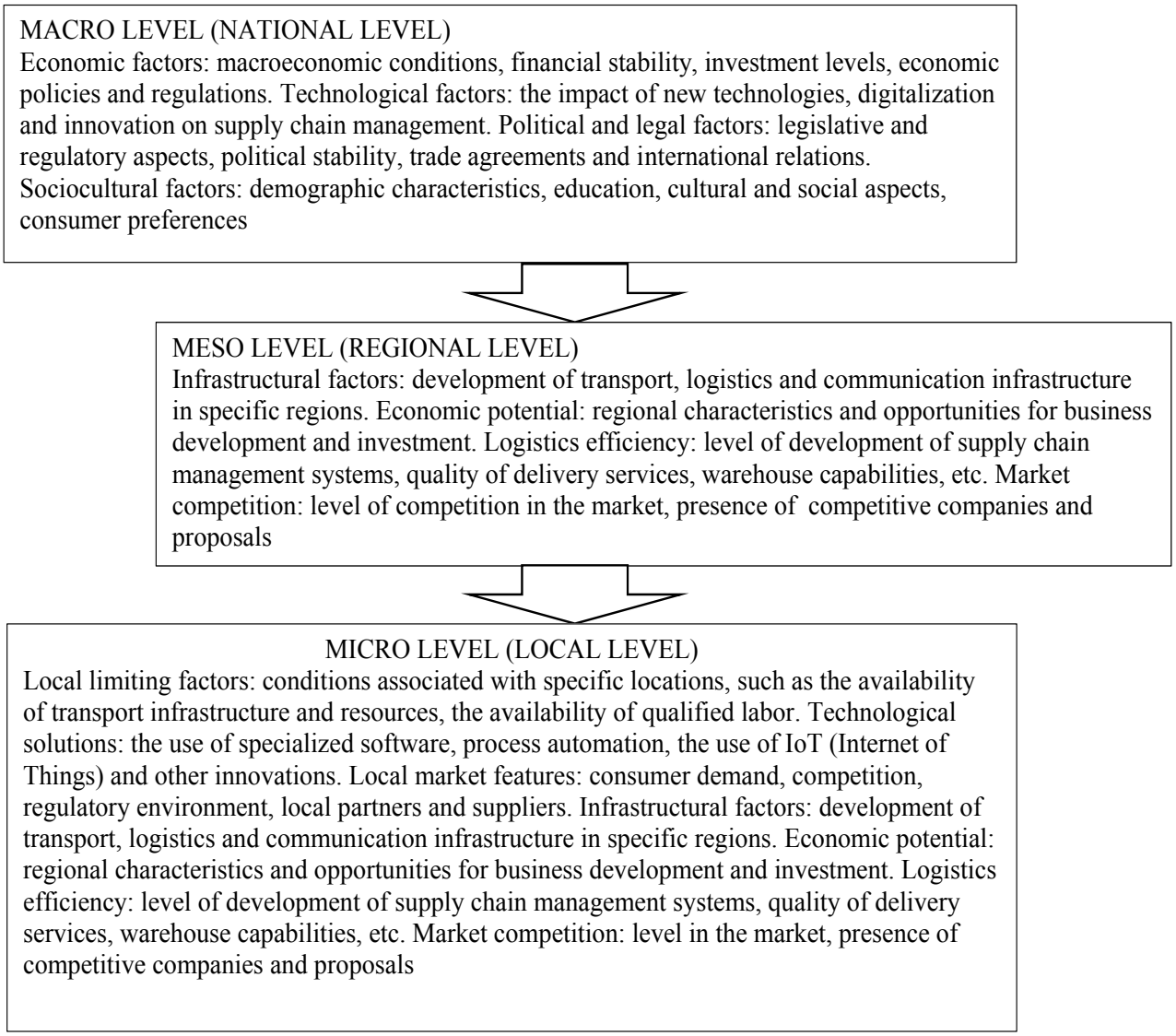

Fig. 1. **Configuration of factors affecting supply chain management in China's transport and logistics systems**

Source: compiled by the author.

• Social media and consumer interaction. Popular social media platforms such as WeChat, Weibo and Douyin (TikTok) provide opportunities not only for communication, but also for shopping, ordering services and even participating in online events.

• Innovation and technological progress. China takes a leading position in the development of information technologies (such as artificial intelligence (AI), blockchain, big data and others), which are actively developed and applied in various sectors of the economy. They contribute to the creation of new business models, improving the lives of citizens and increasing the competitiveness of the country's economy in the world market.

These features create new challenges and require additional study to effectively adapt to changing conditions.

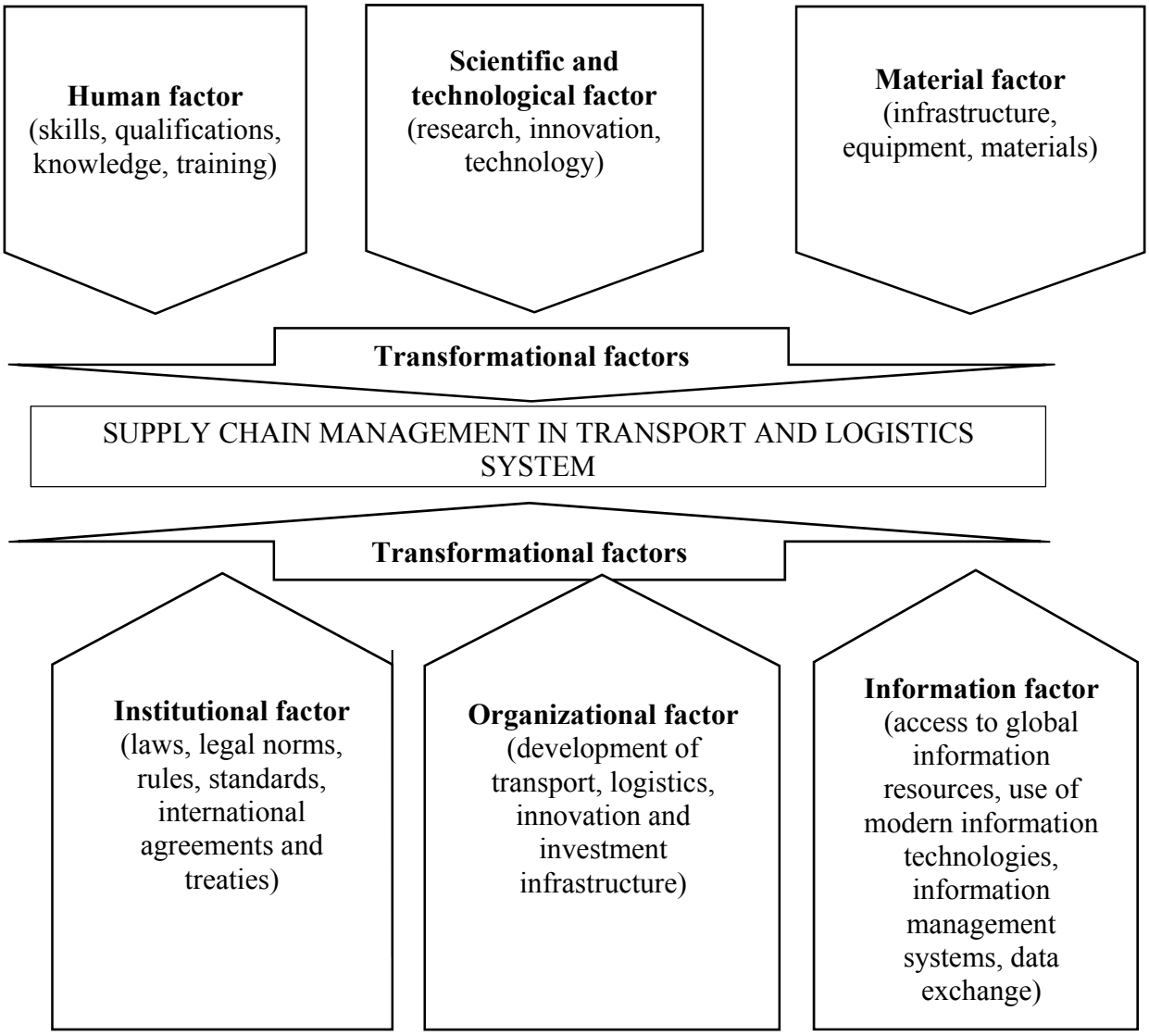

Fig. 2. **Structure of the factor field in the sphere of supply chain management in China's transport and logistics systems**

Source: compiled by the author.

CONFIGURATION OF FACTORS AFFECTING SUPPLY CHAIN MANAGEMENT IN CHINA'S TRANSPORT AND LOGISTICS SYSTEMS

Most SC management experts use a small number of factors based on survey data and regression models [23]. However, the use of regression models to analyze a wide range of factors can lead to ambiguous results [24]. Supply chain management is a complex system involving many interrelated factors, and formalized models may be less suitable for describing complex dynamic structures, making it difficult to interpret and assess the impact of each factor individually. However, specific recommendations for developing research policies are often not offered [25].

The author of this article has attempted to formulate a new approach to identifying factors influencing the formation of a

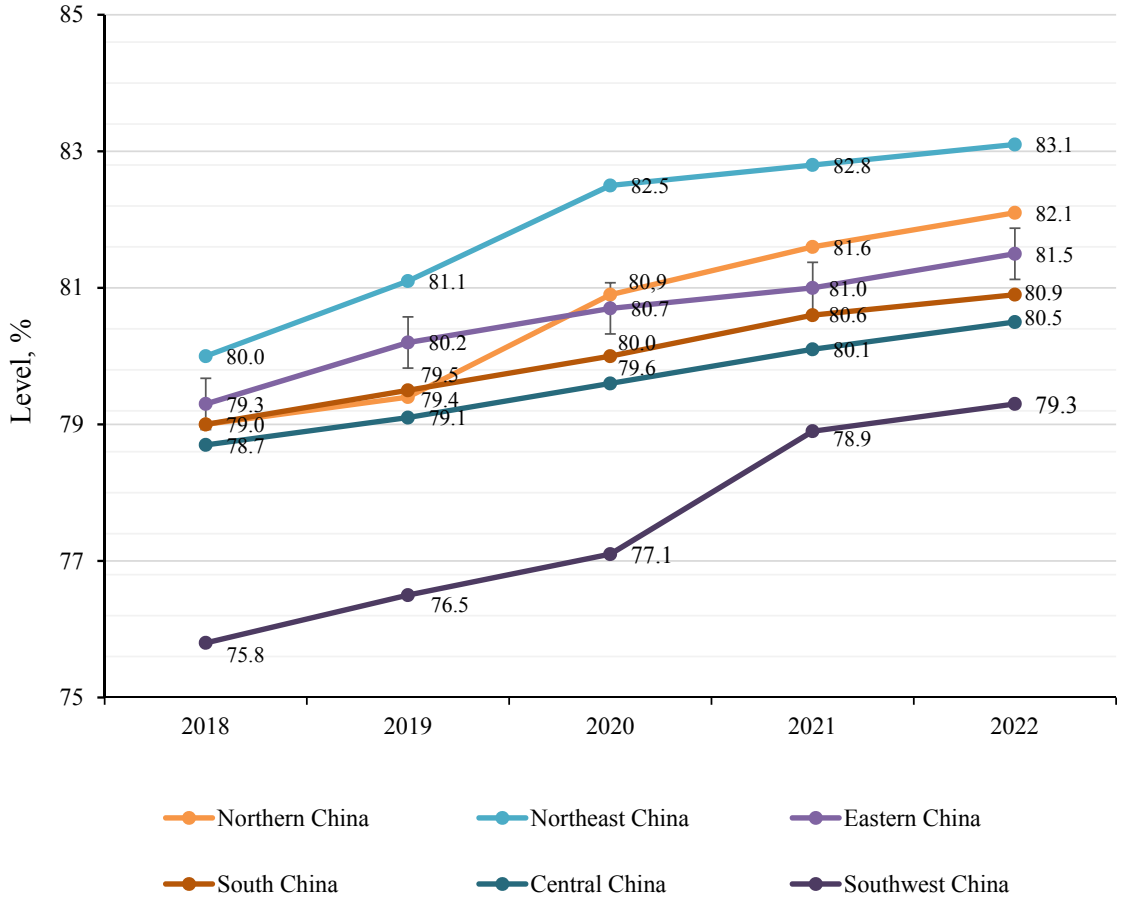

Fig. 3. **Assessment of the level of development of transport, logistics, innovation and investment infrastructure in the regions of China, %**

Source: compiled by the author.

promising supply chain management system in transport and logistics networks in China, which takes into account regional differences in the level of logistics development, especially in the new economy [26] (*Table 4*). This will allow us to offer solutions that meet the specifics of each region.

Taking into account existing methods and the characteristics of the regions, as well as the importance of the level of technology and digitalization in this area, we will systematize the factors influencing the management of SC in the transport and logistics systems of China, and present their author's configuration (*Fig. 1*). When forming it, macro-, meso- and micro-level aspects were taken into account, taking into account the characteristics of the country and helping to improve the efficiency of SC management at various levels.

The configuration of factors takes into account:

- the territorial specifics of China;
- long distances, the difficulty of delivery to remote areas and the inaccessibility of certain regions. These factors, which influence the sustainability and efficiency of supply chains, require adaptation of existing management strategies;
- quality indicators — assessment of infrastructure (roads, ports, warehouses and other logistics facilities), as well as interaction and cooperation with suppliers and

Table 5

Calculation of the concentration index of transport and logistics networks in the region of China, %

Region	Index of digitalization of the regional economy, %	Level of development of transport, logistics, innovation and investment infrastructure in the region, %	Concentration index	Interpretation
Northern China	35.4	82.1	0.43	Sustainable territories. They have a certain concentration of transport and logistics networks and central processing centers that operate stably and create potential for further development
Northeast China	35.1	83.1	0.42	
Eastern China	31.9	81.5	0.40	
South China	31.5	80.9	0.39	Territories of stagnation. There is a certain concentration of transport and logistics networks and central processing centers, but they are functioning unstable and need further development
Central China	29.9	80.5	0.37	
Southwest China	29.1	79.3	0.36	

Source: compiled by the author.

contractors. These conditions are essential to ensure the smooth and efficient movement of goods through the SC.

The effectiveness of supply chain management in China's transport and logistics systems depends not only on traditional ones (natural resources, capital, labor and land), but also on transformational and transactional factors — the structure of the system's factor field is shown in *Fig. 2*.

Transformation factors include a resource component that determines the capabilities and means that are supposed to be used for effective management of the SC, and combines human (skills, qualifications, knowledge), scientific and technological (research, innovation, technology) and material factors (infrastructure, equipment, materials).

Transactional, or operational, includes institutional (laws, norms, rules), organizational (structure, organizational processes), information (information management systems, data exchange) factors that determine the connections, relationships and processes in which resources are involved for effective management SC.

The assessment of the development of transport, logistics, innovation and investment infrastructure in the regions of China, carried out as part of the study, highlights the differences in the level of their development. A high level is typical for the Northern (82.1%),

Northeastern (83.1%), Eastern (81.5%) and Southern (80.9%) regions of China; the smallest is observed in the Center (80.5%) and in the South-West of the country (79.3%) (*Fig. 3*).

The calculation of the concentration index of transport and logistics networks in the regions of China is given in *Table 5*.

Thus, regional differences in the level of construction of a country's logistics infrastructure are obvious, and it is important to continue to work on improving it in less developed areas to ensure more efficient operation of supply chains as a whole. Adaptation of SC management strategies must take into account the specifics of each region to optimally use its potential.

CONCLUSION

The article attempts to formulate a new approach to identifying factors influencing supply chain management in China's transport and logistics systems, taking into account regional differences.

The author shows that the functional efficiency of SC management depends on a wide range of factors — traditional (natural resources, capital, labor and land), transformational (technology, information systems and organizational approaches) and transactional (interaction between various supply chain participants, including suppliers, manufacturers, distributors and customers).

The author shows that the functional efficiency of SC management depends on a wide range of factors — traditional (natural resources, capital, labor and land), transformational (technology, information systems and organizational approaches) and transactional (interaction between various supply chain participants, including suppliers, manufacturers, distributors and customers).

Taking into account the configuration of factors when designing the operation of logistics systems is key to assessing their compliance with the principles of sustainable development. This approach allows not only to increase the sustainability and efficiency of SCs, but also to reduce their negative impact on the environment. The results of the study provide a basis for further development of criteria and indicators for assessing supply chain management systems.

REFERENCES

1. Xiugang W. Digitalization of transport and logistics supply chains: Particularities and prospects in China. *Kreativnaya ekonomika = Journal of Creative Economy*. 2023;17(4):1493–1512. (In Russ.). DOI: 10.18334/ce.17.4.117562
2. Liu X., Zhang K., Chen B., Zhou J., Miao L. Analysis of logistics service supply chain for the One Belt and One Road initiative of China. *Transportation Research Part E: Logistics and Transportation Review*. 2018;117:23–39. DOI: 10.1016/j.tre.2018.01.019
3. Kashin V.B., Pyatachkova A.S., Smirnova V.A., Litvinov A.A., Potashev N.A. Chinese experts on the new five-year plan of the PRC. Analiticheskaia zapiska K6/03/2021. NRU HSE Center for Comprehensive European and International Studies. URL: https://cceis.hse.ru/data/2021/03/29/1386510407/14-я%20пятилетка.pdf (accessed on 20.05.2023). (In Russ.).
4. Jüttner U., Maklan S. Supply chain resilience in the global financial crisis: An empirical study. *Supply Chain Management*. 2011;16(4):246–259. DOI: 10.1108/13598541111139062 (In Russ.: *Logistika segodnya = Logistics Today*. 2012;(1):42–63.).
5. Blos M., Quaddus M., Wee H.M., Watanabe K. Supply chain risk management (SCRM): A case study on the automotive and electronic industries in Brazil. *Supply Chain Management*. 2009;14(4): 247–252. DOI: 10.1108/13598540910970072

6. Odintsova T.N., Yaguzhinskaya I. Yu. On risk management in logistic processes of supply chains. *Aktual'nye problemy ekonomiki i menedzhmenta = Actual Problems of Economics and Management*. 2020;(1):128–135. (In Russ.).
7. Il'ina Yu.A. Stability of global supply chains in an unstable external environment. *Aktual'nye voprosy ekonomicheskikh nauk*. 2016;(52):75–79. (In Russ.).
8. Zhang Yu. The experience of Chinese economic reforms and their theoretical significance. Transl. from Chin. Moscow: Shans; 2017. 239 p. (In Russ.).
9. Keping Yu. Global governance trends and China's strategic choices. *Guówài lǐlùn dòngtài = Foreign Theoretical Trends*. 2012;(10):7–10. (In Chin.).
10. Zhang H. Analysis of the achievements of China and Russia in building national innovation systems. *Segodnya i zavtra rossiiskoi ekonomiki = Today and Tomorrow of Russian Economy*. 2010;(33):49–54. (In Russ.).
11. Zhao D. Analysis of China's logistics system in the context of the COVID-19 epidemic. *Izvestiya Sankt-Peterburgskogo gosudarstvennogo ekonomicheskogo universiteta*. 2020;(3):180–184. (In Russ.).
12. Postnikova T.V. Analysis of factors influencing the formation of supply chain subject to constrained logistic infrastructure. *Nauka i obrazovanie: nauchnoe izdanie MGTU im. N.E. Baumana = Science and Education of Bauman MSTU*. 2012;(5):234–244. (In Russ.). DOI: 10.7463/0512.0400544
13. Ivanov D.A., Ivanova M.A. Uncertainty and risks in supply chains: Classification of tasks and directions of future research. *Rossiiskii zhurnal menedzhmenta = Russian Management Journal*. 2015;13(2):99–128. (In Russ.).
14. Aristov V.M. Assessing methods of supply chain security of organizations in the conditions of uncertainty and risk. *Ekonomicheskii vector = Economic Vector*. 2015;(4):6–10. (In Russ.).
15. Gorishnyaya A.A., Chmut G.A. Digital technologies in transport logistics. *Vestnik universiteta (Gosudarstvennyi universitet upravleniya)*. 2021;(8):34–40. (In Russ.). DOI: 10.26425/1816–4277–2021–8–34–40
16. Smeshko O.G. Regional economy: Factors of development. St. Petersburg: St. Petersburg University of Management Technologies and Economics; 2014. 266 p. (In Russ.).
17. Yao Y., Chzhan Y. Dampers of the Sino-Russian cross-border e-commerce. *Kreativnaya ekonomika = Journal of Creative Economy*. 2020;14(8):1725–1736. (In Russ.). DOI: 10.18334/ce.14.8.110738
18. Yan Lvxin. Problems in the development of cross-border e-commerce logistics in China and ways to solve them. *Shangyejingji = Business Economics*. 2016;(4):11–12. (In Chin.).
19. Vershinina E.I., Novikov A.V. Trends and prospects of transport and logistics development. *Vestnik nauki*. 2021;3(12):173–183. (In Russ.).
20. Osintsev N.A., Kazarmshchikova E.V. Factors of sustainable development of transport and logistics systems. *Sovremennye problemy transportnogo kompleksa Rossii = Modern Problems of Russian Transport Complex*. 2017;7(1):13–21. (In Russ.). DOI: 10.18503/2222–9396–2017–7–1–13–21
21. Tomaichuk L.V. Digitalization of China's economy: Risks and opportunities for society. *Evraziiskaya integratsiya: ekonomika, pravo, politika = Eurasian Integration: Economics, Law, Politics*. 2019;(3):31–36. (In Russ.).
22. Zhang L., Chen S. China's digital economy: Opportunities and risks. *Vestnik mezhdunarodnykh organizatsii: obrazovanie, nauka, novaya ekonomika = International Organisations Research Journal*. 2019;14(2):275–303. (In Russ.). DOI: 10.17323/1996–78452019–02–11
23. Greiz G.M., Kuzmenko Yu.G. Evaluation of the effectiveness of regional transport and logistics systems. In: The Urals as the driver of neo-industrial and innovative development of Russia. Proc. 2nd Ural. ekon. forum (Ekaterinburg, October 21–22, 2020). In 2 vols. Vol. 2. Ekaterinburg: Ural State Economic University; 2020:142–144. (In Russ.).

24. Sun Q. Empirical research on coordination evaluation and sustainable development mechanism of regional logistics and new-type urbanization: a panel data analysis from 2000 to 2015 for Liaoning Province in China. *Environmental Science and Pollution Research.* 2017;24(16):14163–14175. DOI: 10.1007/s11356–017–8980-y
25. Chen S., Chen D., Gang M. The regional logistics hubs location problem based on the technique for order preference by similarity to an ideal solution and genetic algorithm: A case of Sichuan. *Journal of Computational & Theoretical Nanoscience.* 2016;13(9):6065–6075. DOI: 10.1166/jctn.2016.5529
26. Xiugang W. Analysis of the development of China's transport economy management. *Ekonomika: vchera, segodnya, zavtra = Economics: Yesterday, Today and Tomorrow*. 2022;12(5–1):145–152. (In Russ.). DOI: 10.34670/AR.2022.88.78.045

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