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Research on the Mechanism of Enhancing the Resilience of the Industrial Chain under the New Development Pattern of Dual Circulation

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ABSTRACT

Improving the stability and competitiveness of the industrial chain and supply chain is the micro foundation for building a new development pattern, an important way to consolidate and strengthen the foundation of the real economy, and an inherent requirement for accelerating the promotion of high-quality development. Based on understanding the important significance of enhancing the stability and competitiveness of the industrial chain and supply chain under the new development pattern of dual circulation, and based on the characteristics and requirements of the new development pattern of dual circulation in the era background,by analyzing the core connotations and main characteristics of the industrial chain and supply chain, as well as their stability and competitiveness, it is believed that the stability of the industrial chain and supply chain is mainly manifested in five aspects: enterprise embeddedness, industrial synergy, service supporting capacity, basic connectivity, and consumption carrying capacity. The competitiveness of the industrial chain and supply chain is mainly manifested in five aspects: traction and control ability, efficient operation, chain value-added ability, cost intensification degree, and market expansion ability. Thus, an evaluation index system for improving the stability and competitiveness of the industrial chain and supply chain under the dual circulation pattern has been constructed.

KEYWORDS

Dual Circulation Pattern; Industrial Chain and Supply Chain; Industrial chain stability; Industrial chain competitiveness

1 Introduction

Currently, enhancing the resilience and security level of key industrial chains and supply chains has risen to the height of national interests and national security, and it is also an important guarantee for realizing Chinese-style modernization. Especially in the context of more complex and volatile international environments, such as changes in international geopolitics, the rise of anti-globalization trends, and the resurgence of trade protectionism, the security, stability, and competitiveness improvement of industrial chains and supply chains are particularly important. At present, a lot of research achievements have been formed regarding the stability, competitiveness, security, and resilience of industrial chains and supply chains. Constructing an evaluation index system for the stability and competitiveness of industrial chains and supply chains is an innovative exploration and positive practice of researching the stability and competitiveness of industrial chains and supply chains through the means of an evaluation index system. It helps to provide guidance and support for cities to systematically understand the current level of the stability and competitiveness of industrial chains and supply chains and to promote the improvement of their stability and competitiveness.

2 The important significance of enhancing the stability and competitiveness of the industrial chain and supply chain

2.1 Literature Review

Zhang Yifan and Lu Minfeng believe that the application of blockchain in the supply chain can increase the transparency of transactions, reduce corporate operating costs, and improve logistics efficiency, thus promoting the rapid development of the chain economy in developing countries. Li Xianghong and Lu Minfeng believe that blockchain technology helps to improve the intelligent governance level of the industrial chain and supply chain of cross-border e-commerce, thus promoting the sustainable development of the supply chain economy .

2.2 Conducive to Further Improving the Adaptability between the Supply Side and the Demand Side

Currently, the principal contradiction in Chinese society has been transformed into the contradiction between the people's growing needs for a better life and unbalanced and inadequate development. From the perspective of the

economic cycle, this contradiction is concentrated in the fact that the supply system is difficult to respond to the rapid changes in market demand, and the innovation ability has not been able to quickly capture and transmit new consumption in real time. As a result, there is a spatial and temporal dislocation between supply and demand, both internally and externally.

2.3 Conducive to Further Enhancing the Linkage Effect on the Global Economy

The new development pattern of dual circulation promotes the decisive role of the domestic market in resource allocation and economic growth. It not only needs to replace the single circulation pattern of "both ends outside, large import and export" with the circulation between the domestic large market and the international market system but also needs to link the domestic market with the international market. The development and growth of the domestic market promote and drive domestic enterprises to participate in the international market circulation, changing the form, method, and way of participating in international industrial competition. Under the background of economic globalization, the transnational layout and division of labor cooperation of industrial chains and supply chains are common phenomena. Economic globalization, the international connection of industrial chains and supply chains, and international economic cooperation will still be the objective requirements and inevitable trends of world economic development.

3 The main connotations and logical relationships of the new development pattern of dual circulation

3.1 The Basic Understanding of the New Development Pattern of Dual Circulation

It is a transformation from the development model of "both ends outside" to a new development pattern of "domestic-oriented and mutual promotion between domestic and international." It emphasizes that the "internal circulation" supports the "external circulation," and the "external circulation" drives the "internal circulation." Combining the basic discussions of Yuan Jie, Gao Wei, Qian Xuefeng, etc., on the basic connotations and theoretical logic of the new development pattern of dual circulation, this paper believes that the "dual circulation" emphasizes the "internal circulation," and the key lies in the unimpeded domestic economic cycle, which maximally stimulates the potential of domestic economic development. From the perspective of the circulation process, it emphasizes that the links of production, circulation, distribution, and consumption rely more on the domestic market.

3.2 The Basic Understanding of the Industrial Chain and Supply Chain

The idea of the industrial chain can be traced back to the discussion on the division of labor in The Wealth of Nations written by the economist Adam Smith. The relevant theories of the industrial chain have received attention and development in China.

Chinese scholars began to study the industrial chain in the 1980s. Yao Qiyuan and Song Wusheng were the first to propose the term "industrial chain" and carried out a large number of studies on relevant issues of the industrial chain, mainly concentrated during the period from 2000 to 2010.

3.3 The Basic Connotations and Main Characteristics of the Stability and Competitiveness of Industrial Chains and Supply Chains

The term "stability" is borrowed from a state description in physics, referring to the performance that the movement of a system can remain within a limited boundary area or return to the original equilibrium state after being disturbed. Competitiveness is the ability demonstrated through comparison in a competitive group and is a relative concept. Combining the above analysis of the connotations and characteristics of the industrial chain and supply chain, this paper believes that the stability and competitiveness of the industrial chain and supply chain refer to the safety, stability, embeddedness, and the ability to resist shocks, self-adjustment and recovery, and adaptability shown by the industrial chain and supply chain when encountering external shocks or major changes in the development environment. The two are both related and different. On the one hand, the stability and competitiveness of the industrial chain and supply chain are interdependent and mutually conditional.

4 Construction of the evaluation index system for improving the stability and competitiveness

4.1 Main Principles of Construction

First, scientific rigor and systematic comprehensiveness. The stability and competitiveness of the industrial chain and

supply chain are a systematic concept. The setting of the index system should fully reflect its scientific connotation and main characteristics, taking into account both the logical rigor of the system and the scientific representativeness of the indicators.

Second, directional guidance and clear hierarchy. The design of the evaluation index system for improving the stability and competitiveness of the industrial chain and supply chain under the dual circulation pattern plays an important role in promoting high-quality economic development, industrial security, adapting to changes in the macro external environment, and resisting the impact of major emergencies.

Third, a high perspective, far-reaching planning, and forward-looking innovation. Firmly establish a global perspective and strategic thinking, and clearly recognize the opportunities and challenges faced by the stability and competitiveness of the industrial chain and supply chain under the background of the reconstruction of the global industrial chain, the new round of scientific and technological revolution, the increasingly complex international political environment, the rise of anti-globalization thoughts, and the resurgence of trade protectionism.

4.2 Basic Ideas for Construction

Through the combing and analysis of the connotations, characteristics, and influencing factors of the stability and competitiveness of the industrial chain and supply chain in the new development pattern of dual circulation, starting from the two dimensions of the stability and competitiveness of the industrial chain and supply chain, and through further analysis of aspects such as the enterprise embeddedness, industrial synergy degree, service supporting capacity, basic connectivity, consumption bearing capacity, as well as traction and control ability, operational efficiency, chain value-added ability, cost intensiveness, and market expansion ability of the stability and competitiveness of the industrial chain and supply chain, construct an evaluation index system that includes two dimensions of the stability of the industrial chain and supply chain and the competitiveness of the industrial chain and supply chain, and ten aspects such as enterprise embeddedness, industrial synergy degree, and service supporting capacity.

4.3 Main Contents of the Evaluation Index System

The evaluation index system mainly includes two dimensions of the stability of the industrial chain and supply chain and the competitiveness of the industrial chain and supply chain, ten first-level indicators such as enterprise embeddedness, industrial synergy degree, and service supporting capacity, and thirty second-level indicators such as the number of local enterprises among the top 500 enterprises in China and the proportion of the number of branch enterprises. See Table 1 and Table 2 for details.

Table 1 Evaluation Index System for the Stability of the Industrial Chain and Supply Chain

Dimension	First-level Indicator	Second-level Indicator	Unit
Industrial ChainSupply Chain-Stability	Enterprise Embeddedness	The number of local enterprises among the top 500 enterprises in China	unit
		The proportion of the number of branch enterprises	percent
		The number of enterprises cancelled (revoked)	percent
	Industrial Synergy Degree	The economic connection intensity of urban agglomerations	—
		The urban regional industrial coordinated development index	—
		The industrial correlation coefficient	—
	Service Supporting Capacity	The business environment index	—
		The talent attraction index	—
		The total amount of actually utilized foreign capital	hundred million US dollars
		The proportion of the added value of producer services in GDP	percent
	Basic Connectivity Capacity	The number of international (regional) airline routes	route
		The number of first-class ports	unit
		he operating length of rail transit lines	km
		The number of Class 4A logistics enterprises	unit
	Consumption Bearing Capacity	The per capita disposable income of residents	yuan
		The proportion of consumption spillover	percent

Table 2 Evaluation Index System for the Stability of the Industrial Chain and Supply Chain

Dimension	First-level Indicator	Second-level Indicator	Unit
Industrial ChainSupply ChainCompetitiveness	Consumption Bearing Capacity	The per capita disposable income of residents	yuan
		The proportion of consumption spillover	percent
	Traction and Control Ability	The number of national-level "specialized, refined, unique and innovative" little giant enterprises	unit
		The number of listed companies	unit
		The number of unicorn enterprises	unit
	Operational Efficiency	The proportion of the digital economy in GDP	percent
		The product sales rate of industrial enterprises above a designated size	percent
		The industrial Internet index	—
	Chain Value-added Ability	The proportion of the added value of strategic emerging industries in GDP	percent
		The profit rate of main business income of industrial enterprises above a designated size	percent
		The R&D expenditure intensity	percent
	Cost Intensiveness	The labor productivity of the secondary industry	Ten thousand yuan per person
		The incremental capital-output ratio	percent
		The land output per unit	Hundred million yuan per square kilometer
	Market Expansion Ability	The dependence degree on foreign trade	percent
		The proportion of online retail sales in the total retail sales of social consumer goods	percent

Specifically, the stability of the industrial chain and supply chain is mainly reflected in five aspects: enterprise embeddedness, industrial synergy degree, service supporting capacity, basic connectivity, and consumption bearing capacity. Among them, enterprise embeddedness is the micro foundation for the stability of the industrial chain and supply chain, mainly reflected in having a certain scale of the number of local enterprises and headquarters enterprises, with strong enterprise stickiness, and a strong willingness of enterprises to develop and grow locally. Therefore, indicators such as "the number of local enterprises among the top 500 enterprises in China", "the proportion of the number of branch enterprises", and "the number of enterprises cancelled (revoked)" are selected.

The industrial synergy degree is an effective means for the stability of the industrial chain and supply chain, mainly reflected in the ability to achieve good division of labor and cooperation among industries in different regions internally and to achieve cooperation and interaction with more cities and regions externally. Therefore, indicators such as "the economic connection intensity of urban agglomerations", "the urban regional industrial coordinated development index", and "the industrial correlation coefficient" are selected.

The service supporting capacity is the software guarantee for the stability of the industrial chain and supply chain, mainly manifested in having an excellent soft environment that can provide corresponding government service environment and development environment for the development of the industrial chain and supply chain.

The basic connectivity is the hardware support for the stability of the industrial chain and supply chain, mainly manifested in having relatively complete infrastructure that can provide basic conditions such as transportation and logistics for the smooth operation of the industrial chain and supply chain.

The consumption bearing capacity is an important support for the stability of the industrial chain and supply chain, mainly manifested in having a certain scale of the local consumer market, and the self-supply capacity can effectively meet the needs of local residents. Therefore, indicators such as "the per capita disposable income of residents" and "the proportion of consumption spillover" are selected.

The competitiveness of the industrial chain and supply chain is mainly reflected in five aspects: traction and control ability, operational efficiency, chain value-added ability, cost intensiveness, and market expansion ability. Among them, the traction and control ability is the core key of the competitiveness of the industrial chain and supply chain, mainly manifested in having a certain degree of control and voice in the main links of the industrial chain and supply chain, which can promote the correlation and coupling of the upstream and downstream of the industrial chain and the front and back ends of the supply chain. Therefore, indicators such as "the number of national-level 'specialized, refined, unique, and innovative' little giant enterprises", "the number of listed companies", and "the number of unicorn enterprises" are selected.

The operational efficiency is the internal driving force of the competitiveness of the industrial chain and supply chain,

mainly manifested in having advanced technical levels and innovation capabilities, which can drive the transformation and upgrading and efficient operation of the overall chain through the application and transformation of advanced technologies. Therefore, indicators such as "the proportion of the digital economy in GDP", "the product sales rate of industrial enterprises above a designated size", and "the Industrial Internet index" are selected.

The chain value-added ability is the value embodiment of the competitiveness of the industrial chain and supply chain, mainly manifested in that the industrial chain and supply chain continuously extend towards high value-added through the application of innovative technologies, continuously improving the operating benefits of the participating entities on the chain. Therefore, indicators such as "the proportion of the added value of strategic emerging industries in GDP", "the profit rate of main business income of industrial enterprises above a designated size", and "the R&D expenditure intensity" are selected.

The cost intensiveness is the advantageous performance of the competitiveness of the industrial chain and supply chain, mainly manifested in further improving the utilization efficiency of labor, capital, land, and other resources through the reasonable optimization and allocation of resource elements. Therefore, indicators such as "the labor productivity of the secondary industry", "the incremental capital-output ratio", and "the land output per unit" are selected.

The market expansion ability is the external extension of the competitiveness of the industrial chain and supply chain, mainly manifested in having the ability to open up new markets and unblock international market channels, which can meet the needs of larger markets and the continuously emerging new market demands. Therefore, indicators such as "the dependence degree on foreign trade" and "the proportion of online retail sales in total retail sales of social consumer goods" are selected.

5 Conclusion

As the "veins" and "bones" of the entire economic system, the industrial chain and supply chain are an important form of the modern economy. Especially against the background of a more complex and changeable macro external environment, improving the stability and competitiveness of the industrial chain and supply chain will be a key research direction in the future. In addition, since the research on the evaluation index system for the stability and competitiveness of the industrial chain and supply chain is still in the exploratory stage, conducting research on the stability and competitiveness of the industrial chain and supply chain has high value.

This article constructs an evaluation index system from two dimensions of the stability of the industrial chain and supply chain and the competitiveness of the industrial chain and supply chain, respectively, including ten first-level indicators such as enterprise embeddedness, industrial synergy degree, service supporting capacity, basic connectivity, consumption bearing capacity, as well as traction and control ability, operational efficiency, chain value-added ability, cost intensiveness, and market expansion ability. It provides a new perspective and entry point for the evaluation and analysis of the stability and competitiveness of the industrial chain and supply chain, provides support for cities to deeply understand the actual situation and short-board issues of the stability and competitiveness of the industrial chain and supply chain, and provides methods and means for conducting comparative research on the stability and competitiveness of urban industrial chains and supply chains.

At the same time, through the regular monitoring of the above evaluation index system, it is also helpful to promptly understand the existing problems in the industrial chain and supply chain, predict potential risks in advance, gradually establish the industrial chain policy system and policy formation mechanism, and provide references for the research on the industrial chain policy system.

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