

Research on the Paths to Enhancing the Resilience of China's Industrial Supply Chain Against the Background of Deglobalization

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Abstract. Against the trend of deglobalization, problems such as trade protectionism, export controls, and key technological barriers are becoming increasingly severe. The global industrial and supply chains are undergoing profound adjustment and restructuring, and their security and stability are facing severe challenges. In this context, the strategic status of supply chain resilience has become increasingly prominent. Therefore, starting from the background of deglobalization, this paper discusses the logical necessity, practical dilemmas and practical paths of enhancing the resilience of China's industrial supply chain. Against the background of profound adjustments in the supply chain under deglobalization, improving its resilience has become an inevitable choice for China's industrial development. However, China's supply chain currently has prominent problems including imperfect resource systems, constraints on key core technologies, unbalanced industrial layout structure, and insufficient cognitive and structural capabilities. These issues must be addressed by constructing a resource guarantee system, promoting the independence of core technologies, optimizing the diversified layout of the industrial chain, improving digital collaboration, and cultivating "chain-leading" enterprises.

Keywords: Deglobalization, Supply chain resilience, Resource guarantee system, Technological independence

1. Introduction

In recent years, deglobalization measures such as geopolitical conflicts, tariff barriers and export controls have led to drastic changes in the international economic and trade environment, undermining the stability of global supply chains. The number of global trade intervention measures remained above 4,700 from 2020 to 2023, with 2,215 new discriminatory trade policies added in 2024. In its "15th Five-Year Plan", China has listed enhancing the security, independence and controllability of industrial and supply chains as a key measure to consolidate the foundation of the real economy and build a modern industrial system. It can be seen that the industrial supply chain is not only the basic support for the stable operation of China's economy against the background of deglobalization, but also an indispensable strategic pillar for high-quality development. The academic community has conducted in-depth discussions on the resilience of industrial supply

chains. Supply chain resilience stems from the essential requirements of industrialization and constitutes a core component of national economic security in the context of deglobalization. It must possess both resistance and resilience, covering multiple dimensions such as innovation capability, security and reliability, and digitalization. The paths to supply chain optimization should focus on strengthening, supplementing and upgrading industrial chains, while cultivating specialized, refined, distinctive and innovative enterprises, so as to enhance the security of industrial supply chains by exploring innovation endowments and consolidating the industrial foundation. Most existing studies focus on macro qualitative analysis and cultivation policies in specific fields, and fail to conduct research from the perspective of the internal evolution logic of supply chain resilience under deglobalization, especially lacking systematic analysis in terms of institutional optimization and cognitive structure. Based on the reality of profound adjustments in global supply chains amid deglobalization, this paper conducts research following the logic of "logical motivation – practical dilemma – practical paths".

2. Logical motivations for enhancing the resilience of China's industrial supply chain against the background of deglobalization

In the current era, deglobalization trends such as the generalization of national security concepts, the prevalence of unilateralism, and technological blockades are intensifying, profoundly reshaping the operational logic of global industrial supply chains and posing new challenges and requirements for their cross-border flow costs, spatial layout, and security guarantees. The current deglobalization presents an obvious trend of de-risking, shifting from pursuing cost dividends to emphasizing the resistance stability and recovery stability of supply chains [1]. First, the generalization of national security concepts imposes higher requirements on the compliance of industrial supply chains. Economic issues are no longer confined to traditional military security but have expanded comprehensively to fields such as key raw materials and high and new technologies. For Chinese enterprises, the cross-border flow of supply chains faces unprecedented institutional barriers, which not only mean higher entry thresholds but also force us to anticipate the risk of administrative intervention from other countries when laying out overseas industrial chains. Second, unilateralism exacerbates the structural fragmentation of global supply chains. The instrumentalization of economic behaviors caused by unilateralism directly undermines the integrity and stability of transnational supply chains. Some major powers respond to the rise of other countries by unilaterally introducing economic policies and changing the pattern of benefit distribution [2]. Third, technological blockades directly threaten the continuity of modern industrial systems. Against the background of highly refined and closely linked division of labor in modern manufacturing, precise strikes on key "choke point" technologies will lead to partial disruptions in supply chains. Such disruptions will quickly trigger a chain reaction through the upstream and downstream connections of the supply chain, even causing risks of large-scale work stoppages, and ultimately leading to instability and discontinuity in the supply chain network.

Supply chain resilience refers to the systemic capability of a supply chain to effectively resist external disturbances, maintain the stability of its basic framework, and achieve rapid recovery and self-evolution after a chain break when impacted by deglobalization. First, stability capability refers to the ability to ensure that the supply chain maintains its basic framework amid deglobalization disturbances under the existing institutional guarantee system and normal operation conditions. The improvement of stability can ensure the smooth circulation of industrial and supply chains, especially maintaining the normal operation of the entire economic system even in extreme situations [3]. Second, shock resistance capability refers to the hard power to prevent and respond to

deglobalization risks. When facing impacts such as tariff barriers and technological blockades in deglobalization, shock resistance capability can keep the supply chain from breaking as much as possible. It is directly related to whether Chinese enterprises can handle extreme "choke point" dilemmas calmly and systematically, thereby ensuring the continuous survival capability of the supply chain when subjected to trade sanctions. Third, recovery capability refers to the ability of the supply chain to quickly reconnect and resume normal operations after being hit by deglobalization. Strong recovery capability can minimize the work stoppage period to the greatest extent, and realize the reorganization of broken chains in the shortest time by optimizing the reallocation of production factors, thereby reducing the long-tail economic losses caused by deglobalization impacts to the minimum. Fourth, restructuring capability refers to the ability to proactively redesign and optimize the supply chain architecture to avoid future risks brought by deglobalization. Restructuring capability is the highest form of supply chain resilience, enabling China's supply chain not only to survive in the turmoil of deglobalization but also to achieve a growth transformation from passive defense to active leadership. It focuses on learning lessons from experienced shocks, continuously adjusting and learning, and realizing the self-evolution of the supply chain.

Against the background of intensifying deglobalization impacts such as trade protectionism and decoupling and chain-breaking, enhancing the resilience of China's industrial supply chain has become an inevitable requirement for adapting to the shift toward securitization, building a new development pattern, and realizing the transformation and upgrading of the industrial system. First, it is an objective need to adapt to the shift toward securitization of global supply chains. Currently, some developed countries formulate unilateral trade agreements, raise tariff barriers, and implement technological suppression in an attempt to achieve precise decoupling from China's supply chains [4]. Factors such as fragile international logistics channels and blocked flow of technological elements caused by these practices are driving the transformation of global supply chains from efficiency priority to security priority. In this context, China must proactively adapt to this shift by enhancing the shock resistance and recovery capabilities of its supply chains. Second, it is an inherent requirement for building a new development pattern of "dual circulation" to ensure the smooth flow of the domestic circulation and the linkage between domestic and international circulations. The smooth operation of the domestic circulation highly depends on the coordinated smoothness, security, and reliability of supply chains [5]. If strategic links such as key intermediate products are frequently disrupted due to deglobalization impacts, bottlenecks will inevitably emerge in the domestic circulation, further affecting the smooth flow of the overall national economic circulation within the industry. A stable domestic supply chain system is a key condition for ensuring the rational allocation of resource factors and also one of the important factors for attracting high-quality global capital and high-end talents to flow into China and deepening international cooperation. The improvement of the quality of international circulation also requires secure and controllable supply chains, so that China can strive for more discourse power in international competition in emerging fields such as high-end manufacturing and green energy. Third, it is an urgent requirement for the transformation and upgrading of China's industrial system. With the deepening of the new round of industrial and technological revolutions, the logic of global industrial chain division of labor has shifted from simple cost supremacy to equal emphasis on cost, market, and technology accessibility [6]. In this context, China's traditional development model, which has long relied on scale expansion and low labor costs, is facing severe challenges. It not only has a significant risk of manufacturing hollowing out but is also deeply trapped in a dual "low-end lock-in" dilemma, manifested as the lock-in at the bottom of the value chain curve and the overall downward shift of the chain segments [7]. Therefore, continuously consolidating and enhancing

supply chain resilience is the underlying support for ensuring the smooth transformation of China's manufacturing industry from traditional factor-driven to innovation-driven.

3. Practical dilemmas in enhancing the resilience of China's industrial supply chain against the background of deglobalization

3.1. Imperfect resource systems restrict the stable operation of supply chains

The imperfection of resource systems in security construction has led to problems in the stability of China's supply chains when responding to sudden interruptions in resource supply. This is reflected in three aspects: the unsound strategic resource reserve mechanism, the imperfect diversification mechanism for resource import sources, and the lagging emergency system for key resources.

First, the unsound strategic resource reserve mechanism results in insufficient supporting supply capacity for the continuous and stable production of supply chains. The scale of strategic reserves in some key raw material and energy sectors in China does not match the huge demand for industrial security, and there is a problem of unreasonable reserve structure. Existing reserves are mostly concentrated in basic agricultural and industrial raw materials, and the variety composition and proportion arrangement fail to fully adapt to the overall current and future industrial development needs. Reserves in some key areas are relatively weak, affecting the coordinated stability of the upstream and downstream of the supply chain. In addition, the dynamic adjustment capacity of resource reserves is insufficient. The decision-making chain of the national reserve system is long, and the response speed lags behind [8]. The flexibility of the resource collection, storage, rotation, and release mechanisms is poor, making it difficult for reserve resources to fully play their role in stabilizing fluctuations.

Second, the imperfect diversification mechanism for resource import sources also restricts the stable supply of raw materials in the supply chain. Take iron ore as an example. Australia is China's largest source of iron ore imports. According to data from the General Administration of Customs, the share of iron ore imported from Australia reached about 60% in 2025, which gives Australia asymmetric power in iron ore trade and pricing with China [9]. This situation of strong supply chain path dependence on a few countries makes China's key resource supply extremely vulnerable to changes in regional trade policies and price fluctuations under deglobalization, severely weakening supply chain stability.

Third, the lagging emergency system for key resources results in weak prevention and collaboration capabilities of supply chains in the face of sudden shocks. At the risk prevention level, China's investment in early risk monitoring in key resource areas is insufficient, and the emergency response plan systems of various entities are not sound enough. This leads to weak identification and early warning capabilities for potential supply chain disruption risks, making it difficult to effectively resolve external shocks in advance against the background of deglobalization. At the emergency collaboration level, the supply chain information sharing mechanism between departments, industries, and enterprises is not yet complete, and cross-entity emergency collaboration response capabilities are insufficient. An efficient and unified joint response system has not yet been formed.

Precisely because of various imperfections in the resource system, the stable operation of the supply chain is restricted, shaking the foundation of the normalized operation of the entire industry. First, the continuous supply capacity of the supply chain is weakened. Second, risk transmission in the supply chain is faster, substitution costs are higher, and enterprises' bargaining power is weaker. Third, local resource fluctuations caused by deglobalization are more likely to evolve into regional

and industry-wide fluctuations, triggering a "ripple effect" across the entire supply chain: due to weak risk monitoring and collaborative emergency linkage, problems originally confined to a single node are transmitted upstream and downstream, further weakening the stable expectations and market confidence of the entire industrial chain.

3.2. External dependence on technology weakens the shock resistance of supply chains

China's external dependence on some key core technologies and intermediate products makes its supply chains highly vulnerable to disruption when impacted by deglobalization. In terms of key core technologies, fields such as integrated circuit technology and chip manufacturing technology face "neck-jamming" problems, relying heavily on foreign technology introduction. This makes China's industries highly prone to structural disruptions in the supply chain once targeted export controls are imposed by individual Western powers, resulting in a serious lack of overall shock resistance. In terms of key intermediate products, there is also import dependence on high-precision components and production equipment. Currently, China has the highest degree of external dependence on key intermediate products in bulk commodities and high-tech fields. The biomedicine and medical devices, electronic information, and new materials industries are major importers of intermediate products, with import sources concentrated in the United States and its allied countries [10]. Considering the high proportion and irreplaceability of key intermediate products in technology-intensive industries, the intermediate links of the industrial chain are extremely vulnerable to shocks when geopolitical competition escalates or trade restrictions are imposed, and in severe cases, even long-term disruptions can occur.

The dual constraints of internal capabilities and external blockades have shaped external dependence on technology. From the perspective of internal capabilities, China has long been positioned at the middle and low end of the Smiling Curve in the global industrial division of labor [11]. Its accumulation of basic research and core technology research capabilities are relatively weak compared with developed countries in Europe and America. At the same time, enterprises have formed a procurement inertia for mature foreign technology systems during the period of globalization dividends, leading to relatively lagging construction of independent substitution and supply chain supporting capabilities. From the perspective of the external environment, with the generalization of the "national security concept" in the wave of deglobalization, some countries led by the United States have imposed precise technological blockades and unilateral sanctions on China, artificially blocking China's channels for learning and drawing on global cutting-edge technologies.

These technology-dependent links will become the most vulnerable parts of China's supply chain with the worst shock resistance. Due to the lack of technical capabilities and alternative products in domestic production, the recovery time after disruption will be prolonged. Key links cannot be rebuilt and connected within a few months, making the industrial chain more fragile. In the face of technological blockades caused by deglobalization, the lack of core technologies will lead to local chain breaks, affecting the stability of upstream production scheduling and downstream delivery cycles in the supply chain. Overall, external dependence on technology severely weakens the supply chain's ability to prevent extreme risks. Local disruptions can easily evolve into systemic fractures, laying long-term hidden dangers for national industrial security.

3.3. Unbalanced industrial layout structure leads to fragile supply chain recovery capability

The irrational spatial distribution of the industrial layout has resulted in extremely fragile recovery capabilities of China's supply chains in resuming normal operations after external shocks. Currently, some industries exhibit the coexistence of excessive agglomeration and fragmentation in geographical distribution. This spatial allocation model poses major hidden dangers in responding to sudden deglobalization risks. The imbalance in industrial layout structure is mainly manifested in two aspects: the over-concentration of production capacity in key links and the scattered spatial layout of the upstream and downstream of the industrial chain.

On the one hand, the over-concentration of production capacity in key industrial links in a single region weakens the cross-regional replacement capability of supply chains after being impacted. Take the biomedical industry as an example. Data from the Jiangsu Provincial Medical Products Administration shows that 70% of China's Class I new drug production capacity is concentrated in core cities of the Yangtze River Delta, while development in the vast central, western and northeastern regions lags behind. This unipolar spatial layout means that once the core region suspends production due to force majeure caused by deglobalization, it is difficult for other domestic regions to find enterprises with equivalent technical levels and production capabilities to fill the production capacity vacuum, and the supply chain cannot be repaired and restored to normal operation in a short time.

On the other hand, the spatial imbalance in the layout of the upstream and downstream of the industrial chain greatly prolongs the cycle of supply chain recovery and restart. An important prerequisite for the rapid recovery of supply chains lies in the efficient coordination and rapid resource allocation between upstream and downstream production links. However, some Chinese industries face problems such as excessively long resource allocation distances and mismatched and uncoordinated spatial distribution of resource development and processing and manufacturing [12]. Specifically, the upstream production of some emerging industries is concentrated in the central and western regions due to resource endowments, R&D and innovation links are mostly distributed in the Beijing-Tianjin-Hebei region and the Yangtze River Delta, while downstream processing and manufacturing links are concentrated in the eastern coastal areas. The geographical distance between upstream and downstream enterprises in the industrial and supply chains is long, and the overall coordination capability is insufficient. This spatial dislocation of "resources in the west and capabilities in the east" means that once overseas resource imports are blocked, domestic resources need to be transported and allocated across multiple provinces, which not only pushes up logistics costs but also slows down the connection speed between upstream and downstream in emergency situations, directly weakening the rapid recovery capability of the supply chain.

3.4. Insufficient supply chain cognition and architecture capability restricts supply chain restructuring capability

The insufficiency of enterprises' overall cognition of supply chains and top-level architecture capabilities is a core issue restricting the proactive restructuring and evolution of China's supply chain system.

First, enterprises have limitations in their cognition of the deep supplier network of the supply chain. This is specifically manifested in three aspects: First, limitations in the breadth and depth of information acquisition. Some small and medium-sized manufacturing enterprises only focus on first-tier suppliers with direct relationships, lacking comprehensive and in-depth cognition of the geographical distribution, operating status, risk exposure and potential disruption nodes of second-

tier, third-tier and even deeper suppliers. Second, limitations in cognition of the complex correlations between suppliers. A second-tier supplier may supply multiple first-tier suppliers simultaneously, making it difficult for enterprises to clarify the overlapping and interdependent supply relationships in the deep supply network. The path dependence of their information-seeking behavior locks their cognitive vision within the boundaries of the existing relationship network; the ripple effects triggered by differentiation strategies within a supplier network often extend beyond a company's immediate awareness [13]. Third, limitations in lagging perception of potential risks. The operating risk information of deep suppliers is diluted or delayed layer by layer when transmitted upstream, making it difficult for enterprises to timely capture these weak risk signals and prevent them before chain breaks. The above three points of fragmented cognition make it difficult for enterprises to comprehensively assess the real risks of the entire supply chain after shocks occur, lack a global vision and forward-looking perspective when re-planning node layouts, and limit the repair and restructuring capabilities of the supply chain.

Second, the number of chain master enterprises with full supply chain architecture design capabilities in China is insufficient. Chain master enterprises can formulate unified emergency agreements with their global vision and integrated capabilities of full supply chain architecture, transforming fragmented enterprise collections into highly coordinated organic wholes. As command and dispatch centers, these leading enterprises are crucial for supply chain restructuring. However, the number of China's science and technology leading enterprises is small and their scale is limited, and there is still a certain gap between their R&D investment scale and intensity and the world's leading levels [14]. The 2025 Innovation Report by Boston Consulting Group shows that among its list of the world's top 50 most innovative companies, Chinese enterprises account for only 8 seats (16%), while American enterprises account for 24 seats. Due to the lack of "super chain masters" to take the lead in formulating new rules and coordinate the collective optimization of upstream and downstream enterprises, domestic supply chain restructuring links often fight independently, showing a fragmented state, making it difficult to form a unified and efficient evolutionary path.

The problem of insufficient cognition and architecture capabilities is deeply influenced by China's long-term position in the bottom division of labor in globalization. First, many enterprises have formed production-oriented cognition rather than overall value chain cognition. They are accustomed to pursuing efficiency improvement and cost control within the established framework, which is a linear thinking based on local optimization. This cognitive inertia leads enterprises to only focus on "how to make things" while ignoring "why the architecture is designed this way". Second, in the past, Chinese enterprises mostly participated in the international circulation as marginal OEM or module suppliers. Since the management experience of complex supply chains is mostly monopolized by multinational giants, China does not have the ability to dominate the design of global supply chains.

4. Practical paths to enhancing the resilience of China's industrial supply chain against the background of deglobalization

4.1. Improving supply chain stability with a multi-level resource security guarantee system

China should consolidate the foundation of supply chain stability by building a multi-level reserve system and a diversified supply network. Specifically, supply chain stability can be improved from three aspects: resource reserve structure, diversified resource import mechanisms, and risk monitoring and information sharing platforms.

First, it is necessary to optimize the resource reserve structure and establish a dynamic adjustment mechanism to ensure the continuous supply capacity of the supply chain in the face of foreign export controls. The state should selectively expand the strategic reserve scale of key raw materials and introduce a mechanism to dynamically release and adjust inventories according to international market fluctuations. At the same time, government-enterprise cost-sharing mechanisms such as tax reductions and interest-subsidized loans should be implemented to support enterprises in establishing reasonable safety stocks under low-margin environments. This can directly use inventories in all links of the supply chain to hedge short-term fluctuations when supply disruption shocks caused by deglobalization occur, avoiding reoccurrences of delayed procurement, output reduction, or even production suspension due to insufficient reserves. Thus, it ensures uninterrupted continuous supply of all links in the supply chain, prevents sharp fluctuations in operating costs, and keeps the basic foundation stable.

Second, it is imperative to accelerate the construction of a diversified import mechanism for key resources and break the single import path dependence of the supply chain. The import structure can be optimized by laying out an alternative channel network in multiple overseas countries and balancing the proportion of import source countries in the total national imports [15]. Long-term capital investment should be used to deepen production capacity cooperation under the Belt and Road Initiative, improve long-term procurement agreements, and vigorously support domestic resource recovery and research and development of alternative materials to expand alternative channels. In this way, Chinese industries can steadily reconstruct backup supplies relying on early production capacity and technical reserves when a single source country imposes controls, preventing external shocks from directly transmitting to the entire chain and ensuring that the supply chain no longer experiences large-scale fluctuations and paralysis due to external supply contraction under normal conditions.

Finally, a cross-departmental real-time risk monitoring and information sharing platform led by the government with multi-party collaboration should be established. On the premise of ensuring data security, the platform will introduce a commercial-driven mechanism, horizontally linking various industrial regulatory authorities and vertically connecting upstream and downstream enterprises in the supply chain. The platform can realize real-time risk monitoring, multi-agent information sharing, and rapid connection of emergency responses in all links of the entire supply chain. By obtaining real and effective upstream and downstream information in the cloud in a timely manner, the platform can not only achieve early risk early warning to intercept supply chain disruption risks at the embryonic stage, but also realize rapid cross-departmental linkage to prevent local shocks from evolving into regional or industrial chain production shutdowns. It can also stabilize industrial and market confidence, thereby ensuring the sustainable and stable operation of the supply chain.

4.2. Enhancing supply chain shock resistance with a technology independence strategy

The full implementation of a technology independence strategy will fundamentally enhance the hard power of supply chain shock resistance in the face of extreme external suppression. The core lifeline of the industry should be firmly in its own hands through technological breakthroughs under the new national system and industry-university-research collaborative promotion.

First, it is essential to leverage the advantages of the new national system to concentrate efforts on tackling "choke point" technologies. The Fourth Plenary Session of the 19th Central Committee of the Communist Party of China proposed to "build a new national system for tackling key core technologies under the conditions of a socialist market economy" to accelerate the achievement of

high-level self-reliance and self-improvement. The state should give play to the advantage of "concentrating resources to accomplish major tasks", increase subsidies and tax incentives for the research and development and production of upstream key technologies and intermediate products in "choke point" links of the supply chain [16], so as to form a top-down technology spillover effect, thereby effectively promoting production and R&D activities of downstream enterprises and improving the shock resistance of the supply chain at key technical nodes. This can not only enhance the shock resilience of the supply chain but also safeguard national industrial security.

Second, a cross-industry and cross-disciplinary industry-university-research innovation consortium should be established to accelerate the domestic substitution of key intermediate products through multi-agent cooperation. Empirical studies show that promoting industry-university-research cooperation can effectively stimulate high-quality innovation of enterprises [17]. Therefore, it is necessary to promote the interaction and integration of the innovation chain and the industrial chain, encourage leading industrial enterprises to act as bridges, unite top universities and research institutes, and carry out collaborative research and development and industrial application of basic materials and key production equipment.

4.3. Enhancing supply chain recovery capability through diversified industrial layout

China should take the optimization of diversified industrial layout as a strategic focus to improve the recovery capability of the supply chain. Specifically, the physical spatial layout of the industrial supply chain can be adjusted and optimized starting from production capacity backup and neighboring coordination.

First, it is necessary to build a multi-center production backup system so that the supply chain can resume normal operation from disruption as soon as possible. In view of the current situation that the spatial layout of key links is overly concentrated in specific regions such as the Yangtze River Delta and the Pearl River Delta, we should rely on the unified national market and guide the gradient transfer of some mature production capacity and key supporting links to surrounding areas or central and western regions according to local conditions. In particular, regions with certain economic foundations and potential for urbanization and industrial development can be selected as backup locations for the industrial and supply chains. When the main production areas are forced to shut down due to force majeure, satellite production capacity bases can be used for alternative production to reconnect supply chain nodes and resume operation. Such a spatial pattern of "core clusters + backup bases" is an inevitable choice for enhancing supply chain resilience, coping with the complex and volatile political and economic environment of deglobalization, and building a modern economic system.

Second, it is imperative to build an industrial neighboring coordination mechanism to improve the efficiency of supply chain recovery. The neighboring coordination mechanism refers to a collaboration system that realizes close linkage of all links in the supply chain in terms of geographical distance and functional connection by optimizing the spatial allocation of the upstream and downstream of the industrial chain. In terms of geographical distance, the location layout of production capacity in key links should be rationally planned according to industrial characteristics and resource endowments, and the supply radius of resource areas, R&D areas and manufacturing areas in upstream and downstream should be shortened according to local conditions. In terms of functional connection, it is necessary to break the dilemma of simple piecing together of single production links, and deeply integrate and systematically match diversified functions such as technological R&D, core component manufacturing, logistics warehousing and derivative supporting services within the same spatial radius. This neighboring coordination mechanism can

not only accelerate the circulation of materials and reduce transportation costs relying on geographical advantages.

4.4. Enhancing supply chain restructuring capability through digital collaboration and the cultivation of "chain-leading" enterprises

Faced with the dilemma that some enterprises lack overall cognition of the supply chain and there are few leading enterprises in the chain, it is necessary to build a digital information management platform and vigorously cultivate "chain-leading" enterprises with comprehensive capabilities. The information sharing of production and supply data and the strong driving of core node enterprises have facilitated the adjustment and optimization of China's supply chain architecture, thereby enhancing the resilience of the supply chain in the context of deglobalization.

On the one hand, a digital information management platform should be established to provide underlying data support and decision-making assistance for the architectural optimization and dynamic restructuring of the supply chain. Enterprises are encouraged to join hands with local governments and industrial cluster resources to accelerate the application of new-generation information technologies such as artificial intelligence, big data and blockchain to build a real-time updated database of the overall supply chain status information. Specifically, the operation status and distribution information of secondary and tertiary suppliers can be integrated with the production, logistics and inventory management of enterprises themselves, supplemented by risk prediction and early warning reports. This platform is equivalent to providing a cloud-based panoramic map of the supply chain, breaking the "information islands" between all links of the industrial and supply chains, [18] lowering the threshold for enterprises in the middle and lower reaches of the industry to obtain information, and improving the depth of enterprises' scientific cognition of all links in the supply chain. In addition, enterprises can also use the dynamic data flow of the platform to conduct in-depth analysis of the root causes of chain breaks. This can help enterprises bid farewell to the short-sighted responses caused by limited vision in the past, accurately lock in institutional defects and take targeted measures, provide scientific demonstration for restructuring a new supply chain network structure with greater elasticity and pressure resistance, and help improve supply chain resilience.

On the other hand, it is necessary to vigorously cultivate "chain-leading" enterprises with comprehensive architectural capabilities, so as to drive the sustainable optimization of the entire supply chain after external shocks. "Chain-leading" enterprises are core enterprises that have a strong influence on the allocation of most resources in the supply chain and hold an advantageous position in the chain [19], which are crucial to the improvement of supply chain resilience. Therefore, in the specific practice of cultivating "chain-leading" enterprises, the state should increase policy support, and accurately support high-quality backbone enterprises in key areas by setting up special industrial funds, providing green financing channels, and implementing tax incentives. At the same time, relevant enterprises are encouraged to integrate resources across regions through mergers and acquisitions, strategic cooperation and other means, and granted more rights to resource allocation and top-level design within a reasonable scope. In addition, in terms of cultivation paths, an industry-university-research innovation system with enterprises as the main body and coordinated linkage between upstream and downstream should be constructed to consolidate their "chain-leading" status through key technological breakthroughs [20].

5. Conclusion

The intensifying trend of deglobalization has increased the complexity of the global economic and trade environment. Ensuring the security and stability of the industrial supply chain has become a practical requirement for China to respond to external shocks, build a new development pattern, and promote the upgrading of industrial structure. In this special period, the value of the supply chain has gone beyond the traditional scope of enterprise operation and risen to a strategic support for safeguarding national economic security and the stability of the industrial system. However, China's supply chain system is facing multiple dilemmas, including imperfect strategic resource reserve mechanisms, reliance on imports for some key core technologies, unbalanced spatial layout of production capacity, and weak overall architectural design capabilities of enterprises. Therefore, coordinated efforts should be made from four dimensions: institution, technology, space and organization. A multi-level strategic resource guarantee system should be established to prevent disruptions in basic supply; efforts should be concentrated to overcome shortcomings in core technologies to enhance the hard power of shock resistance; the cross-regional diversified layout of industries should be guided to realize production capacity substitution and improve recovery efficiency; relying on digital information platforms and giving play to the leading role of chain-leading enterprises, the structural optimization and restructuring of the supply chain system should be promoted.

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