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Research on the Mechanism of the Chain Leader System in Promoting the Modernization of Local Industrial Chains

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Abstract: This paper focuses on the chain leader system, an important institutional innovation implemented by local governments in China to address internal and external shocks and promote the modernization of industrial chains. Based on a systematic review of literature related to industrial chains and the chain leader system, this paper focuses on analyzing the core mechanism of the chain leader system in promoting the modernization of local industrial chains. The research proposes that its role is mainly realized through three mechanisms: first, the coordination mechanism; second, the precise empowerment mechanism; third, the environment optimization mechanism. Based on the above mechanism analysis, this paper further puts forward policy suggestions such as improving the scientific decision-making and dynamic evaluation mechanism, promoting in-depth integration with the innovation chain and talent chain, and clarifying the boundary between the government and the market, aiming to provide theoretical reference and decision-making basis for optimizing the practice of the chain leader system and building a modern industrial system.

Keywords: Chain leader system; Industrial chain; Industrial modernization

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1. Problem proposal

The chain leader system is an important institutional innovation and a key measure for local governments to promote the modernization of industrial and supply chains and build a modern industrial system. In recent years, governments at all levels in China have paid close attention to the security of industrial and supply chains, and the chain leader system has emerged as the times require. It first originated in Changsha, Hunan Province, in 2017, and was rapidly promoted and applied by local governments after being implemented in Zhejiang Province in 2019. By the end of 2023, 31 provinces, autonomous regions, and municipalities directly under the Central

Government in mainland China had implemented the chain leader system in the whole region or part of the region. Among them, 19 provinces and cities clearly proposed to implement the chain leader system in provincial policies or planning documents, and required subordinate cities and counties to establish corresponding working systems with reference. The implementation effects and existing problems of the chain leader system are gradually emerging.

2. Literature review

2.1. Research on industrial chains

The "industrial chain" is a Chinese characteristic concept proposed by domestic scholars, and similar concepts abroad mainly include value chain and supply chain [1]. There was an upsurge of research on industrial chains in China between 2004 and 2010. Generally speaking, the industrial chain covers the entire process of product or service production, from raw material production to technological R&D, product design, intermediate product manufacturing, final product assembly, and even circulation, consumption, and recycling [2].

In recent years, the central government has paid increasing attention to the industrial and supply chains and their security issues. Terms such as industrial and supply chains and their modernization have been repeatedly mentioned in relevant central documents, and the academic community has set off a new wave of research. Scholars have conducted extensive discussions on issues such as the connotation and characteristics, practical challenges, and realization paths of the modernization of industrial and supply chains [3–6].

2.2. Research on the chain leader system

In recent years, with the rapid development of the chain leader system from "local experience" to "national practice", academic research on it has gradually emerged. Existing literature mainly conducts qualitative analysis around the background, connotation, significance, and problems of the chain leader system. Scholars believe that China's complete industrial system and industrial agglomeration are the inherent foundation for the emergence of the chain leader system, and the dual impact of the severe economic situation on industrial and supply chains is the realistic background for the rapid promotion and application of the chain leader system [7]. Scholars point out that the chain leader system is an institutional arrangement in which local governments select core industries, and administrative leaders serve as "chain leaders" with the goal of stabilizing, supplementing, extending, and strengthening the chain [8]. The essence of the chain leader system is a new industrial management method introduced by local governments to make up for market failures and maintain the normal operation of market mechanisms. It plays an important role in promoting the coordinated development of the industrial chain and innovation chain, improving the basic capacity and modernization of the industrial chain, and enhancing the position of the industrial chain in the global value chain [9]. In the implementation of the chain leader system, there are problems such as unclear boundaries between the government and the market, leading to the trap of "all-powerful government", and one-sided emphasis on local chain production, leading to the rise of local protectionism. Meng Qi used provincial panel data from 2017 to 2021 to empirically test the impact of the chain leader system on the modernization of industrial chains, pointing out that the chain leader system mainly drives the modernization of industrial chains through factor agglomeration and innovation capacity improvement [10].

In addition, some scholars have analyzed the mechanism and path of large state-owned enterprises (SOEs) playing the role of industrial chain leaders. The research group of the Institute of Industrial Economics, Chinese Academy of Social Sciences proposed that central enterprises as industrial chain leaders can realize the industrial chain governance function of industrial chain leaders by solving the bottleneck of "chokepoint" technologies,

driving the breakthrough of basic software and hardware, coordinating the stable production and supply of the supply chain, strengthening strategic demand traction, coordinating the internationalization of the industrial chain, and filling the gap of industrial common technologies. Zhao Jing et al. found through a case study of UHV power transmission projects that state-owned enterprises can solve identity legitimacy through the "chain leader-led" mechanism, promote the process through the organizational method of the "R&D-engineering coupling" mechanism, and build cooperative network resources through "industry-university-research-application collaboration" to promote key core technology research and independent innovation [11].

3. The mechanism of the chain leader system in promoting the modernization of local industrial chains

3.1. Coordination mechanism: breaking the "fragmentation" dilemma and building an industrial development community

In the traditional industrial development model, there are often information barriers and goal differences between various departments and enterprises, leading to scattered resources, serious internal friction, and the formation of a "fragmentation" dilemma. The primary mechanism of the chain leader system is to integrate scattered factors into an organic industrial development community through high-level coordination and efficient coordination.

First, the chain leader system realizes the integration of governance authority. The appointment of the main leaders of cities and counties as "chain leaders" endows industrial chain governance with sufficient administrative authority and resource mobilization capacity. This can effectively break departmental barriers and realize "cross-departmental" collaboration. When the industrial chain development encounters cross-domain problems involving planning, land, environmental protection, finance, talent, etc., the chain leader can convene relevant functional departments to work on-site, conduct "one-stop" decision-making and scheduling, avoiding the institutional transaction costs for enterprises to "run back and forth" between multiple departments, and significantly improving the efficiency of public services.

Second, the chain leader system promotes the connection of market entities. The key to the modernization of the industrial chain lies in the coordinated progress of enterprises on the chain, especially leading enterprises and supporting enterprises. The chain leader plays the role of a "super liaison officer", accurately removing "blockages" within the industrial chain by establishing industrial alliances and organizing supply and demand docking meetings. For example, helping local small and medium-sized enterprises integrate into the supply chain system of leading enterprises, or guiding leading enterprises to release orders and transfer technologies locally, thereby strengthening the "stickiness" of the industrial chain and forming an integrated development pattern of "large enterprises leading small ones and small enterprises promoting large ones" [12-13].

3.2. Precise empowerment mechanism: focusing on "key points" to improve industrial chain resilience and level

The chain leader system is by no means a "broad-brush" universal policy; its essence lies in "precision." Through in-depth on-site "diagnosis", it identifies the specific needs and weak links of the industrial chain, and conducts targeted resource injection and policy empowerment.

First, precisely "making up for weaknesses" to ensure industrial chain security. The chain leader and his special working group will conduct a panoramic scan and risk assessment of the industrial chain, accurately identifying which key links, core technologies, and core components have "chokepoint" risks or excessive

external dependence. On this basis, the chain leader system can launch mechanisms such as "unveiling the list and appointing the leader", concentrating resources to support relevant enterprises or scientific research institutions in technological research, or targeted introduction and cultivation of specialized, refined, and innovative "little giant" enterprises in this field, realizing import substitution and independent control in key areas, and fundamentally enhancing the resilience and security of the industrial chain.

Second, precisely "strengthening advantages" to promote industrial chain upgrading. For links in the industrial chain that already have certain advantages, the function of the chain leader system is to "add flowers to the brocade" and promote them towards high-end and intelligent development [14–15]. For example, the chain leader can coordinate and connect with national-level innovation platforms and top industry expert resources to provide intellectual support for enterprises' technological transformation and upgrading; set up special industrial funds to guide social capital to invest in key technological breakthroughs and advanced capacity expansion of the industrial chain; and take the lead in formulating industry standards higher than national standards to lead the quality improvement and brand building of the entire industrial chain.

Third, precisely "cultivating seedlings" to lay out the future of the industrial chain. The chain leader system has a forward-looking vision and can deploy the innovation chain around the industrial chain. By analyzing the industrial technology roadmap, the chain leader system can lay out cutting-edge fields in advance, guide the R&D directions of local universities and scientific research institutes to align with industrial needs, accelerate the local transformation of scientific and technological achievements, incubate and cultivate future industries, and inject a steady stream of new momentum into the continuous modernization of the industrial chain.

3.3. Environment optimization mechanism: Creating a "rainforest-type" ecosystem to stimulate endogenous growth drivers

The modernization of the industrial chain not only requires external promotion but also a good ecosystem that can stimulate endogenous innovation vitality. The in-depth mechanism of the chain leader system lies in its role transformation from "manager" to "service provider" and "ecosystem builder", committed to creating a vibrant industrial ecological environment like a tropical rainforest.

In terms of the policy environment, the chain leader system promotes the transformation of policies from "supply-oriented" to "demand-oriented." By conducting in-depth research in enterprises, the chain leader can directly hear the voices from the front line, thereby promoting the introduction of more down-to-earth and targeted personalized policies. This avoids the drawbacks of "one-size-fits-all" policies, making policy supply highly compatible with the real needs of industrial development, and forming a "drip irrigation" policy support system [16].

In terms of the business environment, the chain leader system itself is a "letter of trust" and "commitment letter." It sends a strong signal to the market that the local government attaches great importance to and is committed to the development of the industrial chain for a long time, which greatly enhances entrepreneurs' investment confidence and attracts the agglomeration of external high-end factors. A stable, transparent, and predictable business environment, like fertile soil, allows all types of entities on the industrial chain to operate with peace of mind and innovate boldly, and ultimately form a self-reinforcing and sustainable modern industrial system.

4. Policy suggestions

4.1. Improve the scientific decision-making and dynamic evaluation mechanism to enhance the operational efficiency of the chain leader system

It is recommended that local governments establish a "digital brain of the industrial chain", use big data, artificial intelligence, and other technologies to real-time monitor the operation of the industrial chain, accurately identify breakpoints, blockages, and potential points, and provide data support for the chain leader's decision-making. At the same time, introduce third-party institutions to conduct regular evaluations of the implementation effect of the chain leader system, establish a key performance indicator (KPI) system, such as industrial chain resilience, innovation capacity, and local supporting rate, and realize dynamic adjustment and precise policy implementation of "one chain, one policy" to avoid resource misallocation.

4.2. Promote the in-depth integration of the chain leader system with the innovation chain and talent chain to strengthen endogenous drivers

Encourage the chain leader to take the lead in establishing an innovation consortium of "government-industry-university-research-funding-application", and set up "unveiling the list and appointing the leader" projects around key core technologies of the industrial chain. Simultaneously implement the "talent training on the chain" plan, customize talent introduction and training programs according to the industrial chain development map, realize the seamless connection between industrial chain needs and innovation resources and talent supply, and gradually shift the focus of the chain leader system from "making up for weaknesses" to "forging strengths."

4.3. Clarify the boundary between the government and the market to build a sustainable industrial ecosystem

The key to the success of the chain leader system lies in stimulating the vitality of market entities. The government should position itself as a service provider and coordinator, focusing on breaking administrative barriers, optimizing the business environment, providing application scenarios, and protecting intellectual property rights. Focus on supporting "chain master" enterprises to play a leading role, cultivate specialized, refined, and innovative "little giant" enterprises to integrate into the global value chain, and ultimately form a sound development pattern dominated by the market and guided by the government, avoiding improper intervention of administrative means in market competition.

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