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Analysis of Supply Chain Localization Trends and Discussion of China's Response Strategies

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Abstract:

In the context of the current era, where global economic integration faces obstacles and the trend towards de-globalization intensifies, supply chain localization has become an important strategic choice for multinational corporations to cope with geopolitical changes, pandemic shocks, and the rise of developing countries. For China, which plays the role of the "world's factory," supply chain localization can largely be equated with de-Sinicization. Therefore, this paper focuses on the supply chain localization adjustments of multinational corporations in China, not only paying attention to the overall development trend of supply chain localization but also conducting case studies on representative companies situated at different industries and positions within the supply chain. Through in-depth analysis of supply chain layout cases of multinational corporations in various industries in China, this paper reveals the industry characteristics and key influencing factors related to supply chain localization. It also attempts to propose measures that are in line with the current industry status and future development strategies to help the Chinese government and businesses better understand and respond to the comprehensive challenges brought by supply chain localization.

Keywords: Supply Chain Localization, China-US Trade Friction, Multinational Corporations, Response Strategies

1. Introduction

1.1 Research Background

In the wave of economic globalization of the 21st century, the global layout of supply chains has provided significant impetus for the development of multinational corporations. In recent years, with the drastic downturn in Sino-US relations and the global pandemic of COVID-19, the serious flaws of over-concentrated production and long-distance supply chains have been exposed, making supply chain adjustments timely. Simultaneously, the economic rise of developing countries has offered new options for the reconfiguration of supply chains. The rise of countries such as Mexico, Brazil, Southeast Asia and India has provided new momentum for the diversification and localization of global supply chains.

This paper aims to provide a new industry perspective for the current complex pattern of international trade and adjustments in global supply chain management. Moreover, the study further explores how China can effectively adjust its policy framework to adapt and lead the trend of supply chain adjustment, maintaining competitiveness in the global industrial chain.

1.2 Significance of the Research

The primary significance of this research lies in deepening the comprehensive understanding and recognition of the strategic shift towards supply chain localization strategies by multinational corporations. Through case analysis of representative companies among multinational corporations in China, this paper will reveal the factors which could lead to supply chain localization and implementation, and it will also further discuss China's strategic options in the restructuring of the global supply chain, as well as how to leverage the localization trend to optimize its industrial structure and enhance international competitiveness.

1.3 Literature Review

1.3.1 Research on Supply Chain Localization

Regarding the trend of supply chain localization: Kang Jiangjiang and Ning Yuemin (2023) have discovered a decrease in China's position in Apple's supplier list, indicating the existence of the trend towards supply chain lo-

calization. Song Xiaohong (2022) also concludes that the trend of de-globalization objectively exists from official data analysis.

Regarding the reasons for supply chain adjustments: Tao Zhu (2022) proposes that Sino-US tensions, Covid -19 pandemic and geopolitical risks are the main drivers of supply chain localization. Ge Qi (2021) started from the three major theories of Western economics to conduct research, indicating that the factors promoting and hindering the return of supply chains are multifaceted, involving changes in the global competitive environment and factors from host countries, home countries and the enterprises themselves.

1.3.2 Analysis of the Impact of Multinational Corporations' Supply Chain Adjustments in China

On the impact of supply chain adjustments of multinational corporations in China: Xu Jie (2021) believes that the trend towards localization has a significant impact on China, where China has weak discourse power in the supply chain. Therefore, it deserves continuous attention. Ni Hongfu and Tian Ye (2023) also think that the restructuring of the global production layout has caused a real impact on China's industrial chain position, stressing the significant importance of to promote industrial chain upgrading.

1.3.3 Discussion of China's Response Strategies

Scholarly analysis of response strategies mainly includes internal and external aspects: Internally, Xu Jie (2021) and Tao Zhu (2022) suggest strengthening manufacturing and key technologies to enhance supply chain discourse power. Externally, Xu Jie (2021) recommends enhancing supply chains through political and trust cooperation. Bao Qin et al. (2020) propose that openness should promote reform and development. Wang Qian (2022) suggests participating deeply in global governance and advocating new international rules.

1.4 Literature Critique

The literature review reveals that scholarly research on supply chain localization is relatively abundant. The current gap in research is the lack of attention to the industry-specific nature of supply chain localization. Based on this, this paper will study whether there are significant differences in the supply chain adjustment strategies of different types of manufacturing enterprises, and what impact these differences will have on China, providing targeted response measures differentiated by industry and field.

1.5 Research Methodology

This paper will use a case study approach to explore the actual conditions and core motivations behind the phenomenon of supply chain localization through detailed and in-depth analysis of representative multinational companies in three different industries, thereby gaining a deeper understanding of supply chain localization.

The paper intends to select Nvidia, Tesla and Apple as research subjects. These three companies have a leading position in their respective fields, and have deeply cultivated the Chinese market; there is abundant reporting and research on these companies, making materials relatively easy to obtain.

1.6 Innovations and Limitations of the Paper

The innovations of this paper are mainly reflected in the following aspects:

(1) Cross-industry case analysis: The paper provides a cross-industry perspective to study supply chain localization, which helps to reveal the commonalities and differences in supply chain management across different industries.

(2) In-depth micro-analysis at the enterprise level: The paper delves into how representative enterprises implement localization strategies and the impact of these strategies on enterprise operations and the global supply chain structure.

(3) Special focus on China: The paper focuses on the actual impact of supply chain localization trends on China as the world's factory, with conclusions that have more explicit relevance and guidance for China.

The limitations of the paper include:

(1) Limitations of case selection: Although three well-known companies are selected for the case studies, they are all large multinational corporations which may limit the general applicability of the research.

(2) Restrictions on data acquisition: The paper is limited by the author's identity and capabilities, obtaining information only from public channels, making data limitations more apparent.

(3) Lack of quantitative research: The paper lacks quantitative data support, and its conclusions may not be sufficiently persuasive.

(4) Inability to follow dynamic changes: Supply chain localization is a dynamically changing process, and the paper may not fully capture future development trends and impacts. Thus, the content may not correspond to the actual situation.

2. Case Study: Trends and Drivers of Supply Chain Localization

2.1 Overview

From the research on supply chain localization, schol-

ars generally believe that supply chain localization is an objectively existing development trend. However, few scholars have been able to view the issue of supply chain localization from an industry perspective. This paper posits that business decisions are fundamentally about weighing commercial interests with the goal of maximizing corporate benefits. Clearly, supply chain localization may not necessarily meet the business needs of every industry and enterprise, so there may be significant differences in the supply chain strategies chosen by different industries. Indeed, it is necessary to conduct case studies of representative companies in different industries.

2.2 High-End Manufacturing: Nvidia as the Case Study

2.2.1 Overview of Supply Chain Layout

Nvidia, as a leading chip design company, focuses on design, and does not directly participate in manufacturing, relying on global foundries for the production and packaging of chips.

Nvidia currently adopts a diversified and geographically dispersed strategy to optimize its chip foundry supply chain. Although TSMC remains its main foundry partner, Nvidia has begun to collaborate with other foundry enterprises like Intel. Additionally, Nvidia is exploring the possibility of building a TSMC factory in the United States, which would further strengthen its supply chain's geographical diversity and reduce dependency on overseas supply chains. At the same time, Nvidia has thoroughly unhooked from China, considering almost no supply chain layout in mainland China.

2.2.2 Analysis of Reasons for Supply Chain Layout Adjustment

Nvidia's supply chain layout changes have been strongly driven by policies such as the "CHIPS Act": on one hand, these policies aim to encourage and subsidize the localization of the chip industry in the United States; on the other hand, U.S. government policies strictly limit Nvidia's foundry cooperation in mainland China, including prohibiting the establishment of advanced process chip manufacturing plants in China, banning the transfer of advanced technology to mainland China, strictly controlling the export to China of equipment and raw materials directly related to chip manufacturing.

In the field of chip packaging and testing, where U.S. government control is weak, Nvidia's cooperation with Chinese companies like JCET and BOJAY continues; indicating that without policy restrictions, Nvidia would not consider decoupling from China.

2.3 Mid-End Manufacturing: Tesla as the Case Study

2.3.1 Overview of Supply Chain Layout

As a representative enterprise in the new energy vehicle industry, Tesla's supply chain geographical layout has been significantly strengthened in China with the completion of its Gigafactory in Shanghai.

According to Tesla's official statements, the localization rate of the supply chain at the Shanghai Tesla factory has exceeded 90% , and the rate is expected to further increase to nearly complete localization. Similarly, other new energy vehicle manufacturers like Lucid Motors and Fisker Inc have also expressed intentions to build factories in China, further confirming that the supply chain layout of the new energy vehicle industry in China is deepening rather than shifting away from China.

2.3.2 Analysis of Reasons for Supply Chain Layout Adjustment

For Tesla, increasing investment in China's super factories aligns with its overall interests. China's advantages in the supply chain layout are undeniable:

(1) China is the world's largest new energy vehicle market, and localizing the industrial chain in China helps Tesla to better engage in localized competition and meet the Chinese market demand;

(2) China holds an important position in the supply of lithium battery raw materials and battery production technology; deploying factories in China facilitates access to raw materials and cost reduction;

(3) The automotive industry has a very long upstream and downstream chain, and the industrial cluster effect is evident. China has a complete range of industries and balanced industrial development, which is conducive to Tesla building a supplier network in Shanghai and its surrounding areas, including batteries, electric motors, electronic control units and other key components.

(4) The Chinese government's subsidies and tax incentives for the development of the new energy vehicle industry are also favorable for Tesla's development.

In a context that the backdrop of a tightening policy environment in the United States towards China, Tesla is also examining the geographical diversification of its supply chain to enhance overall stability. Tesla has super factories in the United States, Germany, and other regions and will not rely entirely on China.

Additionally, Tesla is exploring the possibility of establishing production bases in other countries such as India, both to tap into new markets and to diversify production risks. This should be the norm for future mid-end manufacturing supply chain layouts.

2.4 Low-End Manufacturing: Apple as the

Case Study

2.4.1 Overview of Supply Chain Layout

Apple's supply chain spans the globe, covering everything from raw material procurement and component production to final product assembly. As Apple's main production base, China undertakes a large amount of component manufacturing and product assembly work. These activities are mostly concentrated in manufacturing steps with relatively low technical content and high standardization, such as circuit board assembly, screen manufacturing and final product assembly.

With the changing global supply chain environment, Apple is also gradually adjusting its supply chain layout. In recent years, Apple has started production activities in India, which has almost synchronized with China in producing the latest iPhone models. Additionally, Apple has built assembly plants in Malaysia, Philippines and Vietnam. Apparently, the trend of de-Sinicization supply chains is evident.

2.4.2 Analysis of Reasons for Supply Chain Layout Adjustment

Apple's supply chain layout adjustment is also driven by multiple factors: First, the appreciation of the RMB and the rising labor costs in China have significantly increased production costs. Second, tariffs and trade policies under the Sino-US trade war have brought potential risks to Apple's global supply chain. Furthermore, the global pandemic has exposed the vulnerability of overly concentrated supply chains.

Of course, Apple's de-Sinicization process is far from complete: while some production steps (such as assembly) have been moved to countries with lower labor costs, key activities such as high-end manufacturing and R&D are still retained in China. Moreover, countries like Southeast Asia, India and Mexico often serve as transit stations; Chinese parts and intermediates are exported to these third countries, which then assemble or brand the products before exporting them to the United States, without an actual transfer of the supply chain.

3. Strategies for China to Respond to Supply Chain Localization

The case studies above illustrate that supply chain localization has significant industry characteristics. Addressing the challenges of supply chain localization should also be analyzed from an industry perspective, avoiding a one-size-fits-all approach.

3.1 High-End Manufacturing

For high-end manufacturing industries, such as semiconductors, the stability of the supply chain and technological sovereignty are crucial to national economic security. Faced with the global trend of de-Sinicization supply chains, the high-end manufacturing industry should take this as an opportunity to follow the path of domestic substitution:

3.1.1 Strengthen Basic Scientific Research and Core Technology Breakthroughs

China must unwaveringly strengthen basic research and tackle key technologies, achieving self-sufficiency in critical areas and core technologies to reduce external dependencies. This is not only an economic strategy but also a national security requirement.

3.1.2 Optimize Tax Incentives and Fiscal Subsidy Policies

Tax incentives and fiscal subsidies should ensure that resources are more precisely directed towards key areas and technologies, especially for projects with significant breakthrough and the development of critical common technologies.

3.1.3 Build a New Pattern of International Cooperation

Faced with the reorganization of the global supply chain, China's high-end manufacturing industry cannot develop in isolation, but should actively integrate into the global innovation network. It should fully leverage China's market advantages and the "Belt and Road" strategy to attract foreign high-end talent and advanced technology, while actively participating in the formulation of international standards to enhance China's voice on the international stage.

3.2 Mid-End Manufacturing

Although the mid-end manufacturing industry has not shown a clear trend of de-Sinicization, the trend and pressure of supply chain localization still bring new challenges to the industry, especially for new energy vehicles. To address these challenges, China should:

3.2.1 Build and Continuously Consolidate Manufacturing Industry Clusters

China should establish more integrated manufacturing ecosystem through policy guidance and infrastructure upgrades. For the new energy vehicle industry, it is essential to build enough charging stations and improve the power grid's supporting capacity.

3.2.2 Optimize the Business Environment to Achieve a High Level of Openness

The mid-end manufacturing industry is China's strength, and it is essential to increase openness, lower the thresh-

old for open access; continuously optimize the business environment, which is crucial for attracting foreign investment and technology and promoting healthy market competition.

3.2.3 Increase Technological Investment to Ensure a Leading Position in Core Segments of the Industry Chain

Technological capability and the scientific level are core factors that determine a country's industrial chain status. In the field of new energy vehicles, the development of core technologies such as battery technology, electric motor technology and electronic control technology is particularly important. Breakthroughs in these technologies will directly determine the performance, cost and market competitiveness of new energy vehicles. Without technological advantages, the agglomeration effect of the industry chain will cease to exist, and the existing supply chain layout advantages will be devastatingly impacted.

3.3 Low-End Manufacturing

In the context of ongoing global economic restructuring and supply chain reorganization, low-end manufacturing faces more complex situations. Therefore, response strategies need to be more flexible and diverse:

3.3.1 Accurately Identify and Respond Appropriately

Industries with low added value, limited technical content and poor environmental friendly should be encouraged to build factories overseas in order to promote the transfer of industrial chains abroad.

For parts of the low-end manufacturing industry that possess core technologies, it is crucial to avoid excessive transfer to prevent hollowing out of the domestic industry chain. It must be recognized that retaining core technologies and talents is key to ensuring sustainable development of domestic industries.

For manufacturing industries that have a certain level of technology, environmental friendly and can solve employment issues, incentives such as land, taxes, talent, and public services should be provided to attract enterprises to settle in the central and western regions of China. This can not only promote local economic development and solve employment issues but also maintain social stability. This regional optimization layout can promote balanced regional economic development and contribute to the balanced development of the country's manufacturing industry.

3.3.2 Encourage High-Quality "Going Global" for Enterprises

Chinese enterprises engaged in low-end manufacturing should be actively encouraged to "go global" and participate in the mid-to-high-end segments of the global supply chain. In this process, enterprises should increase investment in key components and raw materials in order to seek technological breakthroughs and innovation globally through joint ventures and cooperation, master more core technologies and improve their position in the supply chain.

3.3.3 Continuously Innovate Business Models

In the current economic environment, the traditional low-cost competition model no longer meets market demands. Low-end manufacturing does not entirely equate to outdated traditional business and production models. Enterprises can innovate business models, use advanced technology and develop service-oriented manufacturing for purpose customized production to meet the market's personalized needs and enhance their competitiveness.

4. Conclusion

This article has conducted an in-depth analysis of the supply chain layout adjustments of multinational corporations in China and has identified a clear trend of localization with significant industry heterogeneity influenced by a combination of factors including national policies, the state of the industry chain, the position of the enterprise in the supply chain, cost structures and market demands. The contribution of this study lies in its elucidation of the complexity and multi-dimensional characteristics of supply chain localization, as well as providing a more detailed and profound perspective through the discussion of specific cases.

The article posits that supply chain localization is also a key opportunity for China to promote the optimization of its industrial structure and the rebalancing of its value chain. By deepening reforms, opening up and adopting targeted industrial policies, China can transform challenges into opportunities and consolidate or even enhance its strategic position in the new global supply chain configuration.

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