Original Research Article

The impact of sino-US trade frictions on the upgrading of China's manufacturing industry chain and countermeasures

Bingfeng Hou

China Jiangsu International hengtai import export co ltd, Nanjing, Jiangsu, 210029, China

Abstract: The Sino-US trade frictions have brought both challenges and opportunities for the upgrading of China's manufacturing industry chain. This paper analyzes the negative impacts such as supply chain disruption and market access limitations, as well as positive effects like incentivizing domestic innovation and market diversification. It proposes countermeasures including technological innovation, policy support, market expansion, talent development, and international cooperation to promote the upgrading of China's manufacturing industry chain in the new context.

Keywords: Sino-US trade frictions; Manufacturing industry chain; Upgrading; Technological innovation; Policy support

1. Introduction

In recent years, Sino-US trade frictions have become a significant global economic issue, characterized by escalating tariffs, trade restrictions, and technological barriers imposed by the United States. These frictions have had profound implications for China's manufacturing industry, which is a cornerstone of the national economy. As the backbone of China's economic growth, the manufacturing industry chain is facing unprecedented challenges, including supply chain disruptions, market access limitations, and technological restrictions. However, these frictions also present opportunities for China to accelerate its industrial upgrading, enhance technological innovation, and reduce dependence on foreign technologies. Understanding the complex impact of these trade frictions is crucial for formulating effective strategies to promote the sustainable development and upgrading of China's manufacturing industry chain.

2. The impact of sino-US trade frictions on China's manufacturing industry chain

2.1. Negative impacts

The Sino-US trade frictions have significantly disrupted China's manufacturing industry chain. Since the imposition of tariffs and trade restrictions by the US in 2018, direct trade volumes between the two countries have declined. For example, the share of Chinese imports in the US market decreased by approximately 5%, while exports to the US also saw a reduction. This has directly impacted Chinese manufacturing firms, particularly those in industries such as machinery and electronics, which heavily rely on the US market.

Moreover, the trade frictions have led to supply chain disruptions. Many Chinese firms that previously supplied US customers have experienced a higher likelihood of inactivity in their supply relationships. The increased tariffs have forced these firms to either absorb the additional costs or seek alternative markets, both of which can be challenging. Additionally, the trade frictions have exacerbated competition within the domestic market, as some firms have shifted their focus from exports to domestic sales.

Technological restrictions have also hindered the upgrading of China's manufacturing industry chain. The US has imposed strict export controls on high-tech products and technologies, limiting the access of Chinese firms to advanced inputs. This has particularly affected the high-end manufacturing sectors, such as the ICT in-

dustry, where technological innovation is crucial. As a result, Chinese firms face increased production costs and reduced efficiency in their manufacturing processes.

2.2. Positive impacts

Despite the significant challenges, the Sino-US trade frictions have also catalyzed positive changes in China's manufacturing industry chain. One of the most notable effects has been the acceleration of domestic innovation. Faced with technological barriers, Chinese firms have been forced to invest more in R&D to develop independent technologies. This has led to an increase in the number of high-tech investments and innovations, particularly in sectors such as artificial intelligence and new energy.

The trade frictions have also prompted Chinese manufacturers to diversify their markets. Many firms have increased their supply chain connections with third countries, reducing their dependence on the US market. This diversification strategy has not only mitigated the impact of US tariffs but also opened up new opportunities for Chinese products in emerging markets. Additionally, the domestic market has seen a surge in demand for locally produced goods, providing a new impetus for the expansion of China's manufacturing industry.

Furthermore, the trade frictions have led to a reevaluation and restructuring of China's manufacturing industry chain. Firms have been encouraged to improve their supply chain resilience by strengthening domestic and regional supply chain connections. This has resulted in increased investment in green-field projects and enhanced cooperation within the domestic industry. Overall, while the Sino-US trade frictions have posed significant challenges, they have also provided opportunities for China's manufacturing industry to become more innovative, resilient, and globally competitive.

3. Countermeasures to promote the upgrading of China's manufacturing industry chain

3.1. Technological Innovation

Technological innovation stands as a cornerstone for the upgrading of China's manufacturing industry chain, especially amidst the backdrop of Sino-US trade frictions. The Chinese government has been actively driving the integration of advanced technologies such as artificial intelligence (AI), the Internet of Things (IoT), and robotics into manufacturing processes through various initiatives like the "AI Plus" program. This program aims to accelerate the digital transformation of manufacturing by supporting the application of large-scale AI models and the development of intelligent manufacturing equipment. For example, in Shenzhen, industrial AI models are used to analyze data streams from over 2, 000 devices, enabling production lines to optimize technological parameters autonomously nearly 30 times an hour. This not only enhances production efficiency but also reduces costs and improves product quality. Moreover, China has become the world's largest market for industrial robots, with a 36.6% market share in 2020. The widespread adoption of robotics has allowed Chinese manufacturers to increase efficiency, reduce labor costs, and improve product quality. Additionally, the development of AI technologies has enabled manufacturers to analyze vast amounts of data, optimize production lines, and predict maintenance needs. This digital transformation is reshaping the global value chain and helping Chinese manufacturers move up to higher value-added segments. The government's support for technological innovation is also evident in the formulation of over 50 national and industrial standards for the AI sector by 2026. These standards aim to guide the high-quality development of the AI industry and better leverage AI to empower new industrialization. By focusing on real-world applications and market needs, China is fostering a robust innovation ecosystem that drives the upgrading of its manufacturing industry chain.

3.2. Policy support

Policy support is essential for promoting the upgrading of China's manufacturing industry chain. The Chi-

nese government has implemented a series of measures to enhance the resilience and competitiveness of the manufacturing sector. For example, the State Council has rolled out initiatives to modernize the industrial system, focusing on high-quality development of key manufacturing chains, shoring up weak links, reinforcing strengths, and fostering new capabilities. These measures aim to accelerate the construction of a modern industrial system with advanced manufacturing as its backbone.

The government has also emphasized the importance of digital transformation. The "AI Plus" initiative and the development of digital industry clusters are key components of this strategy. The central government has allocated significant funds for science and technology expenditures, with a focus on basic research and national strategic science and technology tasks. These policies not only support the development of high-tech industries but also help traditional industries upgrade through digital technologies.

Moreover, the government has introduced policies to promote green and low-carbon development. This includes initiatives to improve industrial energy efficiency, reduce carbon emissions, and enhance the recycling of industrial waste. By providing financial support and incentives for green technologies, the government aims to create a sustainable development environment for the manufacturing industry.

In addition, the government is working to strengthen the role of leading firms in industrial chains and encourage the development of venture capital and equity investment. This will help drive innovation and support the growth of small and medium-sized enterprises. Through these comprehensive policy measures, China aims to create a favorable environment for the upgrading of its manufacturing industry chain and enhance its global competitiveness.

3.3. Market expansion

Market expansion is a crucial strategy to mitigate the impact of Sino-US trade frictions and promote the upgrading of China's manufacturing industry chain. Currently, China's trading partners are mainly concentrated in developed countries such as Europe, Japan, and the United States. However, to reduce the potential uncertainty brought by the concentration of trade partners, China should actively diversify its international markets.

On the international stage, China should continue to stabilize its diplomatic relations with developed countries while actively promoting the "Belt and Road" Initiative, focusing on cooperation with developing countries. This strategy not only helps to develop emerging export markets but also broadens the development space for China's manufacturing industry. According to China Customs statistics, in 2018, the total trade volume between China and countries along the "Belt and Road" reached 8.87 trillion yuan, an increase of 13.3%, which was 3.6 percentage points higher than the overall growth rate. In the first half of 2019, the total foreign trade volume with countries along the route exceeded US$500 billion, a year-on-year increase of 3.2%.

Chinese manufacturing companies should conduct in-depth market research in countries along the "Belt and Road" to produce products that meet local consumer needs. By adopting appropriate market strategies, familiarizing themselves with national laws and customs, and establishing a good corporate image, these companies can significantly boost their export volumes. Additionally, expanding into emerging markets helps reduce dependence on the US market, thereby enhancing the resilience of China's manufacturing industry chain.

3.4. Talent development

Talent development is a critical strategy to support the upgrading of China's manufacturing industry chain. With the rapid advancement of intelligent manufacturing and the increasing demand for digital transformation, China needs to cultivate a workforce equipped with advanced skills in areas such as artificial intelligence, data analysis, and automation. For example, Lenovo has implemented smart employee management systems that enable full-cycle digital personnel management, resulting in significant improvements in employee efficiency and equipment performance. Additionally, the company has launched learning centers to provide practical and

experiential training, enhancing the capabilities of both internal and external customers.

China's educational institutions are also playing a key role in talent development. Universities and vocational schools are increasingly focusing on interdisciplinary training models that combine mechanical engineering with information technology and other relevant fields. This approach aims to produce compound talents who can drive innovation and meet the demands of the intelligent manufacturing era. Furthermore, the government has implemented policies to attract top-level talent from around the world through programs like the "1, 000 Talent Program," which has successfully attracted both Chinese and non-Chinese talent to contribute to China's manufacturing industry.

To further enhance talent development, China needs to continue investing in education and training programs that align with the needs of the modern manufacturing industry. This includes strengthening STEM education, promoting vocational training, and encouraging international collaboration in education and research. By developing a robust talent pool, China can accelerate the upgrading of its manufacturing industry chain and enhance its global competitiveness.

3.5. International cooperation

International cooperation is vital for China to navigate the complex global trade environment and promote the upgrading of its manufacturing industry chain. China can strengthen its participation in multilateral trade negotiations and regional cooperation mechanisms to advocate for fair trade practices and reduce trade barriers. For example, China has been actively involved in the Regional Comprehensive Economic Partnership (RCEP) and other regional trade agreements to enhance economic integration and market access. Additionally, South-South cooperation with developing countries can provide new opportunities for Chinese manufacturers to expand their market presence and share their technological advancements. By fostering international partnerships, China can enhance its global influence and create a more favorable external environment for its manufacturing industry.

4. Conclusion

In conclusion, the upgrading of China's manufacturing industry chain requires a multifaceted approach. Through technological innovation, policy support, market expansion, talent development, and international cooperation, China can effectively mitigate the impact of Sino-US trade frictions and achieve sustainable industrial development.

References

[1] Wang Yuliang, Zhao Jingfeng, Kong Xixian Research on the Impact of Trade Friction on the Transformation and Upgrading of Manufacturing Enterprises: A Quasi Natural Experiment Based on Chinese Listed Companies [J]. Modern Finance and Economics (Journal of Tianjin University of Finance and Economics), 2025, 45 (02): 110-129

[2] Wang Xinpeng, Song Chenghua The Impact of China US Trade Friction on China's Automotive Product Exports to the United States [J]. Northern Economic and Trade, 2024, (07): 25-28+71

[3] Liu Yuehua, Qu Yue, Huang Haigang, etc The Impact of Sino US Technical Trade Barriers on China's Science and Technology Industry and Countermeasures [J]. International Trade, 2024, (03): 30-41

[4] Mao Junpeng Research on the Path of High Quality Development of China's Manufacturing Industry under the Normalization of Sino US Trade Friction [J]. Foreign Economic and Trade Practice, 2023, (03): 27-34

[5] Ma Zhiguo, Zhao Shiqiao Research on the Impact of China's Patent Protection Intensity on the Quality of Manufacturing Industry Development [J]. Journal of Dalian University of Technology (Social Sciences Edition), 2023, 44 (01): 63-73. DOI: 10.19525/j.issn1008-407x.2023.01.007