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Challenges and Reshaping of Global Supply Chains: - Taking the Secondary Sanctions Imposed by the United States on Enterprises Such as Huawei as an Example

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Abstract

Under the intertwined impact of multiple factors such as the COVID-19 pandemic, geopolitical tensions, technological changes, and the United States' extreme policies towards China, the global supply chain is undergoing a profound reshaping.The United States has imposed secondary sanctions on enterprises such as Huawei. Through measures like prohibiting transactions, restricting financial exchanges, and penalizing third parties, it has had a significant impact on the stability and layout of the global supply chain. Firstly, this article expounds the theoretical basis and characteristics of the global supply chain, clarifying its complexity, synergy and other features. Secondly, analyze the background motives of the secondary sanctions imposed by the United States, including aspects such as geopolitics, outsourcing to friendly countries, and technology control in the place of origin, and examine the specific impact of the sanctions on Huawei's market share, financial data, and supply chain. Finally, explore Huawei's response strategies and achievements, summarize the impact of sanctions on the global supply chain and the reshaping trend, and put forward relevant inspirations.

Keywords

Global Supply Chain; Secondary Sanctions; "Huawei; Supply Chain Reshaping; Coping Strategies.

1. Introduction

In recent years, the global supply chain has been undergoing profound changes under the interwoven influence of various complex factors. The outbreak of the COVID-19 pandemic in 2020 swept across the entire market, causing production disruptions, logistics blockages and a decline in demand worldwide, fully exposing the vulnerability of the global supply chain. The World Bank's World Development Index (WDI) shows that the global economy has been growing at a steady pace since 2010, but this trend suddenly reversed in 2020, marking the most severe economic recession in decades. In 2020, the gross domestic product (GDP) declined by 3.1%, more than twice the contraction since the global financial crisis in 2009.

Meanwhile, geopolitical tensions have been escalating. Frequent events such as trade frictions between China and the United States, Brexit, the Russia-Ukraine conflict, the Israel-Palestine conflict, and the US imposing additional tariffs on Chinese imports have occurred. The tensions in various regions have had a profound and lasting impact on the global supply chain. In this regard, the chairman of Rio Tinto Group of the UK, David Baume, pointed out that the tense geopolitical situation and protectionist policies not only undermine the global industrial chain, but also cause inflation growth and threaten the ability of all countries to address the common challenges facing the world, including poverty, inequality and climate change.

Technological changes are also profoundly altering the landscape of the global supply chain. New technologies represented by artificial intelligence, big data, blockchain and cloud

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computing are constantly emerging, providing strong technical support for the optimization of global supply chains and promoting the innovation and transformation of supply chain models. Artificial intelligence (AI) technology has rendered a multitude of manual operational procedures redundant, encompassing activities such as promotional campaigns, commodity categorization, and supply chain management. E-commerce enterprises leverage AI to forecast market trends, optimize warehousing and logistics processes, formulate pricing strategies, and implement personalized promotional initiatives. Some enterprises have even taken more advanced measures, for instance, estimating orders and dispatching goods prior to receiving purchase confirmations.[1]

Against such a backdrop, the US government has imposed a series of secondary sanctions on Chinese enterprises such as Huawei under the pretext of so-called "national security", which undoubtedly brings new uncertainties to the stability and development of the global supply chain. Since 2019, the United States has continuously upgraded its measures, from initially restricting Huawei's business in the US market, to later prohibiting US enterprises from providing technology and components to Huawei, and then to persuading other countries to jointly impose sanctions on Huawei. Following through on campaign promises, the U.S. Administration announced a new 10% tariff on all Chinese goods on February 1, 2025 (The Wall Street Journal, 2025) on the grounds of fentanyl and other issues (effective from February 4). On March 3rd, the White House of the United States issued an executive order to revise the executive order issued on February 1st, raising tariffs on all Chinese imports from 10% to 20%. On April 2, Trump issued an executive order imposing a 10% benchmark reciprocal tariff on all US trading partners (effective April 5) and additional reciprocal tariffs on 57 countries and regions, including China (effective April 9).Subsequently, Trump imposed multiple rounds of tariffs successively. As of April 17, 2025, the cumulative tariff rate imposed by the United States on almost all Chinese goods exported to the United States was approximately 145% (excluding integrated circuits, semiconductor devices and other products). The "America First" policy during Trump's 2.0 era became increasingly extreme. It not only disrupted the existing international economic and trade order but also monopolized and suppressed high-tech fields and imposed technological blockades through supply chain reconstruction and market differentiation, coercing other countries and regions to contain China. The global value chain division of labor system suffered a huge blow.

1.1. Research Significance

1.1.1. Theoretical Significance

The current global supply chain theory mainly focuses on efficiency and cost optimization, while the research on political and geopolitical risks is relatively insufficient. This study, through in-depth analysis of the secondary sanctions cases imposed by the United States on enterprises such as Huawei, reveals the influence mechanism of geopolitical factors on the global supply chain, providing new perspectives and ideas for the development of global supply chain theory. It is conducive to enriching and improving the supply chain theory system and promoting the further deepening and development of theories in this field.

1.1.2. Practical Significance

From a practical perspective, the research results of this study have significant reference value for both enterprises and the govern experiences, they can have a clearer understanding of the potential risks and challenges in the global supply chain, and thus formulate targeted development strategies. Based on the experience of the former, enterprises can further optimize their supply chain layout in advance, enhance their risk preparedness plans and their own risk resistance capabilities, and occupy a favorable position in the new round of global supply chain reconstruction. For the government, this research can provide a strong basis for formulating relevant policies. The government can refer to research results to formulate

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reasonable policies to safeguard the interests of domestic enterprises, ensure the security and stability of the supply chain, and promote the healthy development of the global supply chain.

1.2. Research Methods and Innovation Points

1.2.1. Research Methods

This study mainly adopted the following two research methods:

(1) Case analysis method: Taking the secondary sanctions imposed by the United States on enterprises such as Huawei as a typical case, conduct an in-depth analysis of the reasons for the sanctions, the measures taken, their impact on the global supply chain, and the response strategies of enterprises like Huawei. Through a detailed analysis of specific cases, the mechanism by which geopolitical factors influence the global supply chain can be more intuitively demonstrated, providing rich empirical evidence for research. By studying the changes in Huawei's supply chain under sanctions, including the restricted supply of key components and the almost standstill of its 5G mobile phone business due to the restricted supply of chips, as well as the response strategies adopted by Huawei such as the domestic substitution plan, supply chain diversification, technological innovation and business diversification, we can gain a deep understanding of the challenges and response methods that the enterprise faces when facing sanctions.

(2) Data statistical analysis method: Collect and organize relevant data, such as Huawei's global market share, operating income, financial data, etc., as well as data related to the global supply chain. Through the analysis of existing data, the impact of US sanctions on enterprises like Huawei and the global supply chain can be more accurately evaluated, providing strong data support for research conclusions.

1.2.2. Innovation Points

This article adopts a unique research perspective, starting from the secondary sanctions imposed by the United States on enterprises such as Huawei, to deeply study the impact of geopolitical factors on the global supply chain, providing a new perspective for global supply chain research. Although previous studies have also paid attention to the impact of geopolitics on supply chains, they lack in-depth analysis of typical sanctions cases. Secondly, based on the analysis of enterprises such as Huawei's response to sanctions, this study has proposed targeted response strategies and paths for reshaping the global supply chain. These strategies and paths not only have guiding significance for sanctioned enterprises like Huawei, but also provide references for other enterprises to deal with similar risks, and at the same time offer useful suggestions for the government to formulate relevant policies.

At the same time, this study combines the theory of global supply chain with practical cases. Based on theoretical analysis, the feasibility and effectiveness of the theory are verified through practical cases. This research method that combines theory with practice makes the research results more practical and operational, and can provide more valuable references for the decision-making of enterprises and the government. Through the analysis of sanctions cases against enterprises such as Huawei, the part of global supply chain theory regarding geopolitical risks has been further improved and enriched. At the same time, it also provides specific practical guidance for enterprises to deal with geopolitical risks in their actual operations.

2. Research Status and Theory of Global Supply Chain

2.1. Research Status of Global Supply Chain

Lu Yue et al. (2024) concluded through empirical analysis that seeking alternative countries for equipment imports is beneficial for enterprises to effectively restructure their supply chains when facing the crisis of chain breaks. Yu Le 'an et al. (2023) studied the supply chain

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reconfiguration strategies considering technological progress in a competitive environment and constructed two supply chain competition models before and after technological progress. Wang Jing (2022) redefined the content boundaries and core scope of the global supply chain reconstruction and digital transformation of China's manufacturing industry from a transactional perspective and functional paradigm. She believes that it is necessary to accelerate the construction of a modern economic system, take the lead in digital emission reduction, and proposed a comprehensive, autonomous, coordinated, peaceful and inclusive Chinese approach to gain the initiative in controlling the global supply chain. Zhou Xianping (2023) empirically analyzed the panel data of 39 countries and regions around the world from 1993 to 2018 and concluded that an increase in a country's geopolitical risks would significantly reduce its overall participation in the global value chain. At the same time, heterogeneity analysis found that the impact of geopolitical risks on medium and low innovation capacity countries is stronger, and the influence of geopolitical actions is stronger than that of geopolitical threats. Golpira Herisr (2022) proposed a novel decentralized decision support system to optimize the design of a universal global closed-loop supply chain.

2.2. Theory of Global Supply Chain

2.2.1. The Concept of Global Supply Chain

The global supply chain is a process of purchasing raw materials and spare parts, manufacturing goods and selling them globally under the background of economic globalization and global division of labor. Multinational enterprises are representative participants in it. It requires a global perspective, extending the supply chain system to the entire world, and selecting the most competitive partners around the world based on the needs of enterprises. Global supply chain management emphasizes planning, coordinating, operating, controlling and optimizing the demands of consumers around the world while comprehensively and promptly understanding them. It relies on modern network information technology support among core enterprises and their suppliers, suppliers' suppliers, core enterprises and their distributors, and even end consumers in the supply chain. To achieve the integration and rapid response of the supply chain, and to ensure the smooth flow of business, logistics, capital and information, so as to meet the demands of global consumers.

2.2.2. Characteristics of the Global Supply Chain

The global supply chain has the following notable characteristics. (1) Complexity: The global supply chain involves numerous participants, including suppliers, manufacturers, distributors, retailers, and end consumers, and these participants are distributed across different countries and regions, involving diverse political, cultural, social systems, and business management approaches. The global supply chain also involves complex logistics networks and diverse market demands, making coordination and management extremely complicated.[2] The trade policies, laws and regulations, tax systems, etc. of different countries vary, which increases the difficulty of supply chain operation. (2) Synergy: The efficient operation of the global supply chain relies on close collaboration among upstream and downstream enterprises. From raw material procurement, production and manufacturing, product transportation to sales, each link needs to cooperate with each other and share information to achieve the overall optimization of the supply chain. Apple's global supply chain, as a typical case, has suppliers in over 50 countries and regions. With its mature management level, it closely cooperates with numerous global suppliers to jointly develop and produce components, ensuring the high quality and innovation of its products. In terms of supply chain management, Apple has achieved real-time information sharing with its suppliers through advanced information technology systems, including order requirements, production progress, inventory levels, etc. This enables suppliers to adjust their production plans in a timely manner based on Apple's demands, ensuring the timely supply of components. In the product transportation and sales

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process, Apple closely collaborates with logistics enterprises and retailers to ensure that products can be delivered to consumers promptly and accurately.[3] (3) Dynamics: The rapid changes in market demand, the iteration of high-precision and cutting-edge technologies, as well as the revision of policies and regulations, require that the global supply chain must possess a high degree of flexibility and adaptability. Enterprises need to constantly adjust their supply chain strategies to cope with market changes. (4) Riskiness: The global supply chain is confronted with various risks, such as political risks, social risks, natural risks, economic risks, etc. Political risks include trade frictions, sanctions, policy changes, etc., which may lead to supply chain disruptions or increased costs. Social risks such as strikes and social unrest can affect the normal operation of production and transportation. Natural risks such as natural disasters and epidemics may damage production facilities and hinder logistics transportation. Economic risks such as exchange rate fluctuations and inflation can affect a company's costs and profits. The trade sanctions imposed by the United States on Chinese enterprises have severely impacted the supply chains of related companies, causing them to face problems such as shortages of components and rising production costs. The outbreak of the COVID-19 pandemic in 2020 led to disruptions in global supply chains, causing significant impacts on many enterprises and revealing the vulnerability of global supply chains in the face of risks.[4]

3. Analysis of Secondary Sanctions Imposed by the United States on Huawei and Other Enterprises

3.1. Background and Motivation of Sanctions

3.1.1. Geopolitical Factors

With the rapid rise of China's economy and the continuous improvement of its technological strength, as well as the continuous strengthening of the "America First" strategy, the geopolitical disputes that were originally suppressed by the Cold War structure and American hegemony have resurfaced after World War II.

The United States has shifted its global strategic focus to major power competition, taking the Indo-Pacific region as its main battlefield. It has controlled Japan to contain China, pushed Australia into the fray, used the Philippines to control China, and harassed China with Latin America and India. At the same time, it has promoted the convergence of NATO and its Asian military Allies, attempting to create an "Asian version of NATO", generate regional hotspots, and even provoke proxy conflicts, thereby affecting China's external development environment.[5] As a representative high-tech enterprise in China, Huawei has achieved remarkable accomplishments in key technological fields such as 5G communication technology, chip research and development, and artificial intelligence. For instance, Huawei holds a large number of patents in 5G technology, and its technical standards and solutions have been widely applied globally, which has weakened the competitive edge of the United States in technology. In order to maintain its technological hegemony, the United States regards Chinese enterprises such as Huawei as strategic competitors and restricts their development by imposing secondary sanctions and other means, attempting to hinder China's technological progress. At the same time, the United States has been continuously strengthening its cooperation with its geopolitical Allies. For instance, in the field of artificial intelligence, in September 2024, the United States signed the legally binding Framework Convention on Artificial Intelligence, Human Rights, Democracy and the Rule of Law with the United Kingdom and the European Union respectively. The United States is pressuring its Allies to ban the use of Huawei's equipment and technology in order to reduce Huawei's share in the global market. The United States has also further weakened the position of Chinese enterprises in the global supply chain by cooperating with its Allies to jointly formulate technical standards and rules, excluding Chinese enterprises such as Huawei. The United States is cooperating with its European Allies

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to promote the so-called "Clean Network" plan, aiming to exclude Chinese enterprises such as Huawei from the construction of 5G networks and strengthen the dominant position of the United States and its Allies in the global communication field. This approach is not only aimed at safeguarding the economic interests of the United States, but also at enhancing its influence in the global political and military fields, consolidating its ally system, and jointly responding to the rise of China.

3.1.2. Friend-shoring Strategy

Against the backdrop of multiple uncertainties such as intensified competition among major powers, the impact of public health emergencies and the ongoing Ukraine crisis, the United States has pursued a "friend-shoring" strategy-relocating supply chains to geopolitically aligned nations-to reduce its reliance on China's industrial and supply chains. This strategy, evolving from earlier concepts of "decoupling" to "de-risking," has seriously affected the stability and smoothness of the global industrial and supply chains.[6]

(1) Supply Chain Restructuring and "De-Sinicization" : The US government is promoting the strategy of supply chain restructuring and "de-Sinicization", attempting to reduce its reliance on the Chinese supply chain and lower the so-called "supply chain risks".[7] Huawei's business covers numerous fields and global suppliers. The sanctions imposed by the United States on Huawei are a typical part of its efforts to "de-Sinicize" its supply chain. Huawei's suppliers are forced to adjust their supply chain layout, transferring production and supply to the United States or its Allies, thereby enabling the United States to regain control of the supply chain. The US government encourages its domestic enterprises to shift their production bases from China to regions such as Southeast Asia and India. At the same time, it imposes tariffs on goods imported from China, attempting to reduce its reliance on Chinese goods. The United States has also been working with its Allies to promote the regionalization and localization of its supply chain in order to reduce its reliance on China's supply chain.

(2) Economic Benefits and Industrial Competition: Huawei's 5G communication equipment features advanced technology and cost advantages, and has gained wide recognition and application in the global market. This poses a direct competitive threat to American communication equipment manufacturers such as Cisco and Lucent. To protect the economic interests of its own enterprises, the United States has imposed sanctions on Huawei, restricting its market expansion and technological development, in order to maintain the competitive edge of American enterprises in related industries.

3.1.3. Technical Control of Origin

Imposing strict export controls on high and new technologies is one of the strategic measures commonly adopted by developed countries to maintain their technological leading edge and keep their technological monopoly position. Such controls will have a huge impact on the technological innovation of the controlled countries.[8] The United States has extremely strict control over the technology of origin. By imposing secondary sanctions, it restricts American enterprises from exporting key technologies and components to Chinese enterprises such as Huawei, attempting to curb the technological development of Chinese enterprises from the source. The US sanctions on Huawei's chips, which prohibit US enterprises from selling advanced chip technologies and products to Huawei, have put Huawei in a huge predicament in terms of chip supply, seriously affecting the development of Huawei's 5G mobile phone business and other related businesses. Such origin technology control measures not only violate the market principle of fair competition, but also hinder global technological exchanges and cooperation, and undermine the stability and development of the global supply chain.

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3.2. Sanctions Measures

The specific measures of secondary sanctions include the following points: (1) Prohibition of transactions with the United States: The United States prohibits its enterprises from conducting any form of transactions with sanctioned Chinese enterprises, including technology transfer, product sales, investment, etc. This has almost completely halted the business of Chinese enterprises like Huawei in the US market, making it impossible for them to obtain advanced technologies and products from the US, nor to make investments or conduct business cooperation there.[9] Huawei's 5G network construction project in the United States was forced to be suspended, making it unable to cooperate with American communication operators or purchase American communication equipment and technology. This has increased the difficulty for Chinese enterprises to obtain imported high-tech intermediate products and components. (2) Financial sanctions: The United States restricts the transactions between sanctioned enterprises and US financial institutions, preventing sanctioned enterprises from obtaining US dollar financing and support. This has hindered the capital flow of Chinese enterprises like Huawei in the international financial market, increased the difficulty of financing, and significantly raised Huawei's financing costs in the international financial market. Some financial institutions have refused to provide financial services to Huawei for fear of violating the US sanctions regulations, which has affected Huawei's capital turnover and business expansion.[10] (3) Third-party Sanctions: Through the application of 'long-arm jurisdiction' and other legal mechanisms, the United States threatens to impose sanctions on third-party enterprises that have business dealings with sanctioned enterprises. This has restricted the export activities of other countries to Chinese enterprises, which has led to a decline in the quality and scale of imports by Chinese enterprises. As a result, Huawei's overseas procurement costs and independent research and development costs have increased.[11]

3.3. The Impact of Sanctions on Huawei Enterprise

3.3.1. Changes in Global Market Share

The sanctions imposed by the United States have had a significant negative impact on Huawei's global market share. In the field of smart phones, Huawei's global market share continued to grow before the sanctions. It reached 14.7% in 2018 and further increased to 17.6% in 2019, reaching the second highest position globally. However, with the implementation of sanctions, Huawei's market share began to decline sharply. In 2020, due to sanctions, its market share dropped to 14.9%, and in 2021, it failed to enter the top five globally, with its market share almost reaching zero. The global market share was still not restored in 2022. Due to sanctions, some countries have banned the use of Huawei's equipment, squeezing its share in the global communication equipment market and severely hindering its market expansion. However, 2023 marked a significant turning point. Driven by the breakthrough in 5G chip technology and the successful launch of the flagship Mate 60 series, Huawei's smartphone market share began a notable recovery. According to industry reports, Huawei's shipments grew significantly in the second half of 2023, reclaiming a position within the Chinese market's top five and laying a solid foundation for its global comeback in 2024.

3.3.2. Fluctuations in Financial Data

The relevant policies of the United States have also led to significant fluctuations in Huawei's financial data. In terms of sales revenue, Huawei's sales revenue was 721.2 billion yuan in 2018 and increased to 858.8 billion yuan in 2019, representing a year-on-year growth of 19.1%. In 2020, the sales revenue was 891.4 billion yuan, increasing by 3.8% year-on-year, still maintaining a certain growth trend. However, in 2021, it was significantly affected by sanctions, with sales revenue dropping to 636.8 billion yuan, a year-on-year decrease of 28.6%. The sales revenue in 2022 was 642.3 billion yuan, showing a slight recovery. A similar trend of change also emerged in operating profit and net profit. In 2021, the operating profit dropped to 42,216

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million yuan, the operating profit margin decreased to 6.6%, and the net profit fell to 355,62 million yuan, indicating a significant decline in profitability. In 2023, Huawei's sales revenue reached 7,041,740,000 yuan, representing a year-on-year growth of 9.63%. Its operating profit and net profit significantly increased, reaching 104,401 million yuan and 86,950 million yuan respectively, with year-on-year growth rates of 147.3% and 144.3%. This indicates that Huawei's business is gradually recovering and growing as it responds to sanctions. Profitability has improved somewhat, but the impact of sanctions still cannot be ignored.

3.3.3. Supply Chain Shock

Before the sanctions, Huawei's supply chain was highly dependent on global suppliers, especially those from the United States for technology and components. After the sanctions, Huawei's supply chain was severely impacted, and the supply of key components was restricted. Chips are core components of Huawei's mobile phones and communication equipment. The sanctions imposed by the United States have prevented Huawei from obtaining advanced chip technology and products from American enterprises. At the same time, it has also made other chips manufacturing enterprises that use American technology reluctant to produce chips for Huawei. For instance, TSMC has stopped manufacturing high-end chips for Huawei, which has put Huawei's chip supply in a huge predicament. It has seriously affected Huawei's 5G mobile phone business and communication equipment business. Huawei's 5G mobile phone business has almost come to a standstill due to restricted chip supply. Although Huawei has maintained its 4G mobile phone business through inventory management and cooperation with Qualcomm, in the long term, the vulnerability of the supply chain has become prominent. In the field of communication equipment, due to the insufficient supply of key components, Huawei's production and delivery have also been affected, failing to meet market demands and further weakening Huawei's competitiveness in the global market.

4. Huawei's Response Strategies and Results

In response to these severe challenges, Huawei and similar enterprises have adopted a multi-faceted strategy to mitigate the impact of sanctions and reshape their supply chains. In terms of the domestic substitution plan, Huawei has been actively promoting chip design and research and development. Based on the R&D of HiSilicon, it has increased investment in chip design and launched advanced products such as the Kirin processor. Facing the technological blockade from the United States, Huawei established Hubble Investment, taking stakes in several domestic EDA enterprises as well as semiconductor material, equipment and manufacturing companies, to promote the independent control of the chip industry chain. In terms of component manufacturing and material supply, Huawei has collaborated with domestic enterprises to achieve domestic substitution of key components and materials. The screens are supplied by BOE and Visionox, optical components by Sunny Optical Technology, metal frames by BYD Electronics, and aluminum alloy and titanium alloy materials for mobile phone frames by Furong Technology and Yinbang Co., Ltd.. Significant progress in software autonomy is exemplified by Chinasoft International's deep involvement in the construction of the HarmonyOS ecosystem with rich experience in HarmonyOS application research and development, migration, etc. It has supported the HarmonyOS delivery of multiple applications, created benchmark cases in the fields of government affairs and finance, and also developed a native application technology development platform for financial HarmonyOS.

In terms of supply chain diversification, Huawei has enhanced the competitiveness of domestic suppliers by providing them with orders, funds and technological support, cultivated a group of powerful domestic suppliers, reduced reliance on foreign suppliers, and strengthened the stability and resilience of the supply chain. Meanwhile, Huawei is actively laying out the global market to achieve market diversification. In Europe, it collaborates with local research

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institutions and universities to develop 5G technology and cooperates with multiple operators. Open up the market in the Middle East and Africa with high cost-performance products and quality services; Cooperation with Brazilian operators in Latin America has consolidated its market position.

Technological innovation and business diversification are important measures for Huawei to address challenges. Huawei has increased its investment in research and development, developing technologies such as chip stacking, superconducting quantum chips, and photonic chips in the semiconductor field and obtaining patents. It has also launched HarmonyOS, which is equipped on a large number of devices and ecosystem devices, covering multiple industries. In addition, Huawei has expanded into new businesses such as cloud computing and smart vehicles. Huawei Cloud has attracted a large number of customers and provided a wide range of services. The revenue of the intelligent vehicle solutions business has grown significantly. Through the vehicle BU and Smart Selection car model, it has cooperated with many automakers and launched a number of popular models.

The effectiveness of the response strategy has been remarkable. In terms of financial data, Huawei's global sales revenue in 2024 increased year-on-year, approaching the highest level in history. The operating profit margin remained stable, the cash flow from operating activities improved, and the financial situation was stable. Its market share has also recovered. The aforementioned strategic responses culminated in a dramatic recovery. In the fourth quarter of 2024, Huawei returned to the top of the smartphone market in China. This remarkable rebound was largely fueled by the sustained momentum of its 5G chip breakthroughs and the overwhelming market success of its multiple flagship products, such as the Mate 60 and Pura 70 series, which were well-received by consumers. In the communication equipment market, its 5G base station layout in emerging markets was steadily advancing. The resilience of the supply chain has also been enhanced. Through domestic substitution, the reliance on foreign suppliers has been reduced, improving the autonomy and controllability of the supply chain. The diversification of suppliers and markets has enhanced the stability of the supply chain, and a complete risk management system has improved the emergency response capability.

5. The Impact and Reshaping of U.S. Secondary Sanctions on Global Supply Chains

5.1. The Impact of U.S. Secondary Sanctions on Global Supply Chains

Firstly, the secondary sanctions imposed by the United States significantly increase the risk of supply chain disruptions. The coercive nature of these sanctions forces non-U.S. companies to choose between complying with U.S. regulations or maintaining business relationships with sanctioned entities. This dilemma often leads to the abrupt termination of critical supply relationships. The case of Huawei provides a stark illustration of this risk. The company's reliance on external foundries for advanced chips made it particularly vulnerable. When access to key manufacturers like TSMC was severed due to U.S. pressure, Huawei's 5G smartphone business was nearly paralyzed, demonstrating how a single point of failure in a complex global supply chain can have catastrophic consequences. This effect extends beyond the sanctioned company itself. Many enterprises globally that relied on Huawei's equipment and technology were also affected by the disruption of its supply chain. The inability to complete supplies on time damages corporate reputation and customer trust, and can lead to the breakdown of cooperative relationships among upstream and downstream enterprises. This disrupts the established standards and coordination of the supply chain system, further exacerbating its inherent instability on a global scale.

The secondary sanctions imposed by the United States have led to a significant increase in global supply chain costs. Sanctions have led to an increase in trade barriers, restrictions on

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goods transportation, forced changes in transportation routes, and prolonged transportation times, all of which have significantly raised transportation costs. Some enterprises, in order to avoid being affected by sanctions, have no choice but to bypass transportation routes of sanctioned countries or regions, which leads to increased transportation distances and higher transportation costs. Some goods that were originally transported through US ports have had to choose other ports due to sanctions. This not only increases the transportation time but also raises the transportation cost. At the same time, in order to find alternative suppliers, enterprises have to spend more time and energy on market research and negotiations, which increases the difficulty and cost of procurement. As the production capacity and product quality of alternative suppliers may be inferior to those of the original suppliers, enterprises still need to pay higher prices to obtain the required products and components

5.2. Trends in Supply Chain Reshaping

Technology is driving the transformation of supply chains, which is reflected in digital transformation, intelligent upgrading and green development. In the process of digital transformation, the Internet of Things enables real-time monitoring of goods and equipment, big data assists in decision-making optimization, and artificial intelligence helps with prediction and scheduling, etc. In the process of intelligent upgrading, intelligent warehousing, logistics robots and intelligent supply chain management systems have enhanced efficiency and accuracy. Green development initiatives include the adoption of new energy, environmentally friendly materials, and green packaging. Regionalized and localized supply chain layout has become an important trend for the next stage of development. The acceleration of regional economic integration, such as the signing of RCEP, has reduced trade costs within the region and strengthened the supply chain pattern in the Asia-Pacific region. More and more enterprises are strengthening their local supply chains, establishing production, supply and R&D systems locally to enhance stability and resilience. The rise of nearshore outsourcing and friendly outsourcing has led enterprises to choose suitable outsourcing locations based on their own needs, reducing costs and enhancing competitiveness. Supply chain security and risk management have been strengthened, A scientific risk assessment system has been established.

6. Conclusion

Risks are identified and evaluated through indicators and models covering all links. Improve the emergency response mechanism, formulate emergency plans and establish emergency reserves, and conduct regular drills and evaluations to enhance response capabilities. Countries should cooperate to formulate rules, share information, jointly ensure the security of supply chains, and enhance collaboration in areas such as trade rules, information sharing, and response to public health events.

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