Enhancing Supply Chain Resilience: Adaptation Strategies of China's Manufacturing Industry Post-Pandemic-A Case Study of BYD, an Automotive Manufacturer

Haonan Teng
Macau University of Science and Technology, Macau, China

Abstract: This study focuses on the path to enhance the resilience of China's manufacturing supply chain after the pandemic. Taking BYD as a typical case, it constructs a four-dimensional evaluation system of "Resistance-Adaptability and Recovery-Autonomous Control-Government Support" (RACG). This study aims to identify the core elements of supply chain resilience and strategies adopted by manufacturing enterprises of different scales and industries in response to disruptions such as geopolitical sanctions, material shortages, and price volatility. This paper empirically verifies the effectiveness of the optimization strategies by studying the interview content of relevant manufacturing and conducting a comparative analysis with other manufacturing enterprises and answer three core questions regarding supply chain resilience in the manufacturing industry. The research shows that: ① BYD achieves control over key links through the autonomy of core technologies; ② The diversified layout of the supply chain reduces the impact of external risks; ③ The agile transformation of production significantly improves the efficiency of crisis response, and its production capacity recovery performance is better than the industry benchmark; In addition, the coordination of policy resources strengthens short-term emergency response capabilities.

Keywords: Supply Chain Resilience; Vertical Integration; Technological Sovereignty; Agile Procurement; Industrial Diversification; Risk Management

1. Introduction

On the global manufacturing landscape, China has consistently played a pivotal role as the "world's factory," thanks to its massive manufacturing foundation and comprehensive supply chain system.

The enhancement of supply chain resilience has remained a critical research focus on manufacturing and global economic studies, particularly given the heightened importance of supply chain adaptability and recovery capabilities when confronting global emergencies. In recent years, COVID-19 inflicted severe impacts on global manufacturing. As a pivotal global manufacturing hub, China's supply chains suffered substantial disruptions during the pandemic, with numerous enterprises encountering unprecedented challenges in production, logistics, and raw material procurement.

BYD, as a leading Chinese automobile manufacturer, successfully navigated pandemic-induced crises through strategic supply chain adjustments, production process optimization, avoidance of single-source dependencies, diversified industrial layouts, and strengthened collaboration with upstream/downstream partners, demonstrating exceptional supply chain resilience. Since Professors Christopher and Peck formally defined supply chain resilience in 2004 as "the capability to restore supply chains to their original or improved status post-disruption," global manufacturing has increasingly prioritized this attribute, a trend accelerated by the pandemic. This paper investigates how BYD addressed post-pandemic supply chain challenges through flexible strategy adaptation and enhanced information technology infrastructure, exploring pathways to strengthen supply chain resilience in Chinese manufacturing.

2. Literature Review

2.1 The Research of Supply Chain Resilience

Scholars have varying emphases in their

definitions of supply chain resilience. In 2003, Rice and Caniato first proposed the concept of supply chain resilience. Supply chain resilience refers to the complex adaptive ability of an organization in a supply network to maintain dynamic balance, respond to disruptive events, and quickly recover. Xiong Jianyong believes that this resilience helps enterprises respond more quickly and effectively after the supply chain is impacted, thereby reducing supply chain operation risks, minimizing losses, and establishing a competitive advantage[1]. Ponomarov defines supply chain resilience as the ability of the supply chain system to adapt to internal and external disturbances, risks, and changes. This adaptability enables the supply chain to quickly return to normal operation and maintain stability and efficiency in the face of uncertainty and challenges.

Currently, many scholars have conducted extensive research on the resilience of industrial chains and proposed various methods for assessment and improvement. For example, Wang Zeyu (2022) constructed a resilience evaluation standard system for the marine vessel industry chain from four dimensions: resistance, recovery, reorganization, and renewal capabilities [2]. Duan Hao (2020) pointed out that the resilience of an industrial chain refers to the response of each link in the chain to internal and external shocks, specifically the ability to resist the damage caused by shocks, maintain the stability of its own system, and prevent chain breaks[3]. Research on the resilience of industrial chains has received extensive attention from the academic community. However, there are few studies on the assessment standard system of supply chain resilience in China's domestic manufacturing industry. The adaptation strategies of China's manufacturing industry supply chains in the post-epidemic era are mostly short-term adjustments and mostly quantitative studies, which provides research space for analyzing how to enhance supply chain resilience and build a long-term resilient supply chain for China's manufacturing industry.

2.2 BYD's Adaptation Strategy

While the pandemic has posed severe challenges to China's manufacturing industry, it has also provided an opportunity for domestic manufacturers to re-examine and enhance the resilience of their supply chains. As a well-known Chinese automaker, BYD has demonstrated remarkable supply chain resilience and adaptability during the pandemic, including rapidly adjusting production lines, consistently increasing investment in independent research and development, and diversifying its industrial layout. BYD's pandemic adaptation strategy has gradually drawn the attention of scholars both at home and abroad. Han Xingguo (2023) pointed out in his analysis of the new energy vehicle industry that in 2021, due to rising raw material prices and the impact of the pandemic, the gross profit margins of domestic new energy vehicle manufacturers generally declined[4]. BYD's gross profit margin for its new energy vehicle business was 17.2%, a 6-percentage-point drop from 2020. However, due to BYD's proactive adjustment of its product structure, leveraging economies of scale to increase gross profit margins, and further strengthening cost control capabilities, the proportion of raw material costs in total costs gradually decreased because of product structure optimization. Chen Li (2022) pointed out that compared with traditional vehicles, the new energy vehicles developed by BYD Company have significant advantages in both quality and cost. This is because the power battery has replaced the generator as the most core component of new energy vehicles. With the advancement of technology, the cost of batteries is gradually decreasing, which determines that the price of BYD's new energy vehicles is relatively lower than that of other companies. Moreover, due to BYD's long-term research and development in the battery field, its battery technology is far ahead of the global average level, with a global market share of over 20%[5]. To a certain extent, this reduces the shortcomings of electric vehicles that need frequent charging and have a short driving range, putting BYD's new energy vehicles in a leading position in terms of both quality and cost. Wu Liwen (2025), through an analysis of financial indicators, noted that government subsidies significantly enhanced BYD's profitability and development capabilities, but its debt-paying ability declined. BYD's reliance on government subsidies is evident, and the effectiveness of supplementary funds has not been maximized[6]. This can also be seen as an assessment of the strength of supply chain resilience, and government subsidies should be considered.

3. Horizontal Comparative Analysis

This study carefully selected representative

samples for interviews to ensure coverage of Chinese manufacturing enterprises across different industries, scales, and geographical distributions. Specifically, seven manufacturing enterprises were chosen, including new energy manufacturing giant BYD, electronics and technology companies Huawei and Xiaomi, technology-intensive manufacturer DJI, electronic technology processing service provider Foxconn, as well as labor-intensive small enterprises-a corrugated pipe workshop and a machinery parts processing factory. These enterprises demonstrate broad industrial representation spanning key sectors such as automotive manufacturing, electronics, component processing, and drone technology, while also showing significant variation in company size from multinational corporations to local small workshops.

Regarding interview participant selection, this study established clear criteria. Considering supply chain resilience is a specialized topic, we required interviewees to hold managerial positions (e.g., workshop supervisors or department managers) to ensure in-depth understanding and practical experience in supply chain management. The final participants were all executives over 40 years old, with most holding bachelor's degrees or higher (except the corrugated pipe workshop manager), all possessing thorough knowledge of supply chain resilience.

For interview methodology, semi-structured interviews were employed to facilitate in-depth exploration of supply chain resilience issues. The interview protocol focused on core themes including supply chain disruption risks, response mechanisms, and recovery strategies, aiming to comprehensively understand different manufacturers' coping strategies and resilience capabilities. Interview questions were customized according to enterprise characteristics and industrial contexts. For instance, large technology firms like Huawei and Xiaomi were asked about strategies to ensure supply chain stability under international sanctions, while small workshops focused on impacts of raw material price fluctuations and order instability. By comparing responses through similar questions across enterprises, this approach identified commonalities and differences in supply chain resilience building methods, providing substantial empirical support and theoretical references for subsequent research and practice. Meanwhile, grouping them into three clusters for horizontal comparative analysis, this study summarizes the essential prerequisites for robust supply chain resilience based on their differences, thereby highlighting the rationality of establishing an evaluation criteria system for building resilient supply chains.

3.1 Technology Sovereignty vs. Agile Ecosystem: A Comparison of Supply Chain Resilience Models of Huawei and Xiaomi in Response to International Sanctions

About differences in supply chain disruptions that encountered by different enterprises, we firstly asked some questions about the product managers of two very different types of domestic companies, Huawei and Xiaomi. We mentioned that both companies have experienced US sanctions against domestic companies, and the product managers of both companies have also stated the authenticity of this matter. Secondly, we asked our questions about the supply chain: what extents the companies are sanctioned and how should both sides deal with the predicament of supply chain sanctions.

According to the description of the two product managers, we believe that Huawei's risk of supply chain disruption is far greater than Xiaomi's. Huawei's R&D investment will reach more than 100 billion yuan in following years, and its self-developed Kirin chips, HarmonyOS systems and 5G standards directly challenge the US semiconductor technology monopoly. On the other hand, most of Xiaomi's hardware costs rely on imported components (such as Qualcomm chips and Samsung screens), and Internet revenue is bound to Google's GMS service, which does not touch the core interests of American technology and the dominance of American technology, so the risk of supply chain disruption for Xiaomi is not high.

Therefore, we believe that in the context of the accelerated restructuring of the global technology industry chain, Huawei and Xiaomi have shown very different supply chain resilience strategies in the face of international sanctions. There is a clear difference between the two, which are driven by technological sovereignty and prioritized by business efficiency.

3.1.1 Huawei

For Huawei, Liang Jiarong, the scholar believes that the reason why Huawei will be sanctioned

by the United States is because it has mastered the world core technology of the advanced level in the world; And the reason why Huawei was able to be under US sanctions, its success also depends on its own insistence on independent research and development of core technologies[7]. When we asked Huawei's product manager about the difficulties, he inevitably mentioned the significant impact of US sanctions on Huawei's supply chain related industries. When we asked what measures, Huawei has taken to combat supply chain sanctions, the manager mentioned that Huawei's full-link technology autonomy is their main tool, and using this method to break through the blockade is the right decision. From chip design (HISilicon Kirin), operating system (HarmonyOS), to core components (RF front-end, optical module) to achieve full-stack self-development.

3.1.2 Xiaomi

Xiaomi's manager said that most of the sanctions against Xiaomi are to restrict the supply of chips but have not been banned, and the strategy adopted in the face of sanctions is completely different from Huawei's. Since Xiaomi has not been subject to strict supply chain sanctions, it has adopted an open ecosystem strategy to ensure that business efficiency is prioritized, so it is important to establish a multi-source supplier pool, such as Qualcomm and MediaTek dual-chip platforms that can complete the switch of key components within 45 days. Simultaneously, Xiaomi adopts a direct-sales supply chain structure, reduces complexity through outsourcing production. The construction of regional manufacturing centers in India, Vietnam, Mexico and other places, the localization rate of its Indian factories has steadily increased over the past four years, while avoiding import tariffs as much as possible, and regionalizing and decentralizing to avoid geopolitical shocks.

In general, Huawei and Xiaomi have adopted two different models in the face of US sanctions. Huawei advocates domestic substitution, thereby greatly reducing its dependence on the outside world. While Xiaomi is mainly risk-averse, with strong external dependence but strong adaptability and resilience, with high agility.

3.2 Technology-Intensive Enterprises vs. Labor-Intensive Enterprises: A Comparison between DJI's Global Chip Localization and Jiangsu Chenguang Corrugated Pipe Co., LTD Procurement Alliance

3.2.1 DJI

When asked whether DJI would also face the risk of supply chain disruptions, Mr. Li, the head of the R&D team admitted that the chips for DJI drones are indeed highly dependent on imports, especially those from the United States.

When further exploring how to address this issue, Mr. Li said that DJI's supply chain risk resistance capabilities are mainly reflected in chip localization and diversified supplier management. Through independent research and development, DJI reduces reliance on foreign chip suppliers, achieving independent control of chips, fundamentally enhancing independent control over chip supply. Meanwhile, for other key components of drones, such as sensors and batteries, Mr. Li said DJI had sought actively seek cooperation with high-quality domestic suppliers to promote the substitution of domestic components. When choosing domestic suppliers, strict quality control standards are needed to help domestic suppliers improve product quality. Mr. Li stated that DJI was collaborating with domestic battery manufacturers to jointly develop high-performance batteries for drones and gradually achieve domestic battery production. This can enhance and optimize the autonomous control of core components and build a more flexible supply chain.

3.2.2 Jiangsu Chenguang Corrugated Pipe Co., LTD

Jiangsu Chenguang Corrugated Pipe Co., LTD. (hereinafter referred to as "Chenguang") is a small and medium-sized manufacturing enterprise specializing in the production of stainless-steel corrugated pipes. It is a typical example of the small workshops we chose. The main risk of supply chain disruption in their company is the drastic fluctuation of raw material prices. Their raw materials mainly rely on imported high nickel stainless steel, so its price fluctuations have a significant impact on the supply chain.

Boss Zhu mentioned making small-batch and high-frequency purchases (such as once a week) to avoid stockpiling. Sign a "price guarantee agreement" with local steel dealers: Stipulate that the purchase price will follow the market, but when the single fluctuation exceeds 5%, the order can be cancelled, or the price can be renegotiated. Purchase stainless steel scraps from large factories (with a price about 30%

lower than that of new materials) to produce low-end products. Cooperate with local hardware processing factories to establish a waste recycling network.

Boss Zhu also mentioned they established the "Corrugated Pipe Procurement Alliance". Within Jiangsu Province, there will be 5 to 10 small factories jointly negotiating prices with steel mills. After the purchase volume increases, they will receive discounts. Companies take turns to serve as purchasing representatives among themselves and share the negotiation costs. At the same time, the warehouse space will also be shared. This greatly reduces the cost of inventory management. It effectively alleviated the problem of fluctuations in raw material prices.

3.2.3 Zhejiang Hongdae Machinery Parts Processing Factory

In addition, this article also chose to interview another small manufacturing workshop: Zhejiang Hongda Machinery Parts Processing Factory. It is a small manufacturing enterprise mainly producing mid-to-low-end machinery parts Through an interview with Mr. Zhou, the deputy factory director, an analysis is made on whether there are any similarities or differences with Jiangsu Chenguang Corrugated Pipe Co., LTD, which is also a small manufacturing enterprise.

The main risk it faces lies in the instability of customer orders. Since its customers are mainly large-scale machinery manufacturing enterprises, their order demands fluctuate significantly due to market demand, project progress, and other factors. Sometimes, the order volume may suddenly decrease or increase, causing great difficulties for the enterprise’s production planning and raw material procurement.

Mr. Zhou stated that to address this risk, on the one hand, they strive to secure long-term cooperation orders when signing contracts with customers, clearly defining the flexible range of order quantities and delivery times to reduce the frequency and amplitude of order fluctuations. On the other hand, in internal management, they have adopted a “flexible production unit” model, flexibly combining production equipment and personnel according to different types of parts processing demands, enabling the enterprise to quickly adjust production plans to adapt to changes in orders. At the same time, like Jiangsu Chenguang, they have established strategic partnerships with several nearby parts processing factories to jointly cope with peak and off-peak order periods, achieving resource sharing and complementarity.

3.3 Similarities and Differences between Zhejiang Hongda Machinery Parts Processing Factory and Jiangsu Chenguang Corrugated Pipe Co., LTD

Both Zhejiang Hongda Machinery Parts Processing Factory and Jiangsu Corrugated Pipe Company are small manufacturing enterprises with relatively small scales. They lack market dominance in their respective industries and are vulnerable to external risks, often being at the end of the industrial chain and relying on large enterprises or specific market demands for survival.

Jiangsu Corrugated Pipe Company is greatly affected by fluctuations in raw material prices, while Zhejiang Hongda Machinery Parts Processing Factory mainly faces the risk of unstable customer orders. These risks pose challenges to the production and operation of the enterprises and the stability of their supply chains. Once these risks occur, they may lead to production halts or increased costs for the enterprises.

Jiangsu Corrugated Pipe Company addresses the risk of raw material price fluctuations by establishing procurement alliances and adopting the "ant colony" procurement method. It reduces the impact of raw material price fluctuations through joint price negotiations with suppliers and small-batch, high-frequency procurement. In contrast, Zhejiang Hongda Machinery Parts Processing Factory focuses on signing long-term cooperation orders with customers, adopting the "flexible production unit" model, and establishing strategic partnerships with similar enterprises in the industry to deal with the risk of unstable orders. It reduces the impact of order fluctuations on the enterprise through measures such as clearly defining the flexible range of orders, flexibly adjusting production plans, and sharing resources and complementing each other.

Furthermore, the main differences between DJI and Chenguang in supply chain risk management are as follows:

As a technology-intensive giant, DJI's risks are concentrated on its reliance on imported high-end chips. By vertically integrating core technologies (such as flight control systems) and building a dual-track supply system, it seeks dominance in the industrial chain through a

strategy of "technology localization + global layout", but it needs to deal with the high investment and technical barriers in chip research and development in the long term.

As a labor-intensive small enterprise, Chenguang's core challenge lies in the fluctuation of raw material prices. It adopts a defensive strategy of "flexible survival + local collaboration", offsetting nickel price risks through joint procurement and reducing costs by recycling waste materials. It enhances its survival resilience in the short term consequently.

The two respectively interpret the adaptive wisdom of enterprises at different levels of the industrial chain in complex environments with "technological sovereignty" and "agile survival". The former focuses on reconstructing the global supply chain pattern, while the latter focuses on the collaborative breakthrough of the local ecosystem.

The main supply chain gaps between small workshops like Zhejiang Hongda and large manufacturing enterprises are reflected in three key dimensions:

(1) Resource & Capability Disparities:

Compared to corporate giants like Huawei, Xiaomi, or DJI, small manufacturers such as Zhejiang Hongdae Machinery Parts Processing Plant or Jiangsu Chenguang Corrugated Pipe Co., Ltd face significant disadvantages in capital, technology, and talent. Large corporations leverage their financial strength and R&D teams to invest in core technology development, securing control over critical supply chain nodes. In contrast, Zhejiang Hongda operates with limited funding and equipment, focusing on low-to-mid-tier mechanical part production, lacking both innovation capacity and resources for large-scale R&D, global supply chain expansion, or complex digital transformation initiatives.

(2) Supply Chain Position & Influence:

Small workshops like Zhejiang Hongda typically occupy peripheral roles in supply chains, serving as subcontractors to large enterprises. Their production schedules and material procurement remain highly dependent on client orders, with minimal bargaining power or leadership in supply chain dynamics. Conversely, dominant players like Huawei and Xiaomi occupy core positions, steering supply chain evolution through technological prowess and market influence. They orchestrate supply chain optimization, set industry standards, and drive systemic innovation.

(3) Risk Mitigation Mechanisms:

Large enterprises deploy comprehensive, system-level risk management strategies. Huawei's approach-achieving end-to-end technological autonomy and diversified industrial ecosystems-exemplifies this. Their resilience stems from controlling core technologies, expanding business verticals, and implementing advanced digital governance. In contrast, Zhejiang Hongda adopts simpler, localized tactics: securing long-term client contracts, adopting flexible production units, and forming strategic alliances with peer workshops. While these measures provide partial risk buffering, they pale in effectiveness compared to the multilayered, technology-enabled safeguards of industry leaders.

This asymmetry underscores how scale and resource concentration create self-reinforcing advantages for large firms, while small workshops remain trapped in reactive, dependency-driven operational models. Bridging this gap requires targeted policy interventions-such as SME-focused R&D subsidies, shared industrial platforms, and digital skill development programs-to access to supply chain resilience tools.

To gain insight about how manufacturing companies maintain supply chain resilience in face of supply chain disruption, I selected two representative companies: BYD and Foxconn. Although both are large-scale manufacturing companies, their supply chain resilience is distinct, optimization strategies are also different.

3.4 Vertical Integration vs. Contract Manufacturing Reliance: The Resilient Game between BYD's Full Industrial Chain Autonomy and Foxconn's Global Contract Manufacturing Model

3.4.1 BYD

When asked whether BYD was facing the risk of raw material shortages, Mr. Wang, the head of BYD's operations department, mentioned that BYD had performed well in its vertical strategy and rapid industry transformation.

BYD has always adhered to a comprehensive "vertical integration" strategy and has made many layouts in the field of key components in advance. For example, in addition to supplying its own new energy vehicles, its power batteries are also supplied to other car companies,

occupying an important position in the entire industry; Core technologies such as motors and electronic controls have also been independently developed and produced. This highly autonomous production model enables BYD to independently control the production schedule without relying on external suppliers for the supply of key components, thereby effectively improving the stability and resilience of the supply chain.

After the outbreak of the epidemic in 2020, many of BYD's branches quickly set up emergency response teams. BYD started cross-border mask production in less than 30 days. In the face of a large-scale shutdown of the epidemic, BYD was able to quickly integrate the upstream and downstream supply chains, directly use the manufacturing advantages of workshops and factories, and quickly transform the production of masks and epidemic prevention materials from scratch through rapid response and resource integration.

It is worth noting that in the interview, he also said that industrial diversification is also one of the reasons why BYD's supply chain is resilient. Apart from the huge success of the mask transformation project, since 2008, BYD has provided metal shell processing services for Apple. With its outstanding manufacturing capabilities, BYD has long successfully entered the supply chain of electronic products. In addition, smart devices, photovoltaic and new energy power generation, medical supplies, electronic accessories, transportation equipment, etc. are also part of BYD's industrial business.

As he said, supply chain resilience is not something that can be improved suddenly, and although the epidemic has made Chinese manufacturing companies face severe challenges, it also provides them with an opportunity to re-examine and improve supply chain resilience. However, this kind of supply chain resilience is not possessed by every company, such as the Foxconn Group interviewed by our group online.

3.4.2 Foxconn

We interviewed Mr. Zhou, a workshop manager of Foxconn, when asked whether the industry should be diversified, he bluntly said, “Usually we just cooperate with production and assembly.” “When the epidemic came, we were very affected. Many raw materials and parts are supplied by the customer, and once the other party is cut off, we can't do it.”

In fact, they have indeed taken some measures, such as increasing the number of suppliers, establishing cooperation with many suppliers on a global scale, making the supply sources more abundant, and decentralizing procurement to avoid single dependence.

In addition, Foxconn try to global production layouts in Asia, Europe, America and other regions, so that it can be closer to customer markets and raw material origins, reducing the impact on the supply chain due to long transportation distances and logistics disruptions.

Through these two interviews, we can see that there is a fundamental difference between BYD and Foxconn's supply chain resilience in response to major external shocks. First, BYD's core advantage lies in its high degree of vertical integration and ability to control key links in the supply chain. It does not rely on a single external supplier and can independently develop and manufacture key components. This "upstream-to-downstream" approach allows it to flexibly allocate resources and adjust production direction according to unexpected situations. Even in the face of global raw material shortages or transportation disruptions, it can quickly activate emergency plans--transforming to produce masks is a good example. Foxconn, on the other hand, while its manufacturing capabilities are extremely strong, it lacks control over core materials and designs, leaving it with little room to react when there is a disruption in the upstream supply chain. At the same time, Foxconn's business model is highly focused on foundry and single customers (such as Apple), which is indeed extremely efficient in stable periods. While once the external environment changes, it is easy to fall into passivity. This seems to expose the problem of a single industrial structure.

3.4.3 Further comparison

Amidst the complex, volatile global manufacturing landscape and multiple uncertainties, supply chain digitalization and R&D investment have become critical initiatives for manufacturing enterprises to enhance competitiveness and build supply chain resilience. When addressing the third core question of this study – digital transformation and R&D investment – during interviews with both a small workshop manager and Mr. Sun, production supervisor at BYD, notable disparities emerged regarding the emphasis on supply chain digitalization and R&D commitments across manufacturers of varying

scales and types. The following presents a detailed comparative analysis based on case studies of BYD and Jiangsu Chenguang Corrugated Pipe Co., Ltd.

(1) Research investment

In terms of researching and development investment, after reviewing BYD's annual financial statements and related information, it is evident that the company adopts a core technology strategy, continuously advancing research and development in the new energy vehicle industry. BYD consistently prioritizes technological innovation in automotive production, enhancing the technical sophistication of its vehicles. The company increases annual investments in innovation and patent R&D, holding the highest number of patent applications for new energy vehicle technologies in the industry. The company's substantial annual R&D expenditures have driven consistent revenue growth, securing its strong market position.

(2) Digitalization transformation

BYD has established a highly integrated digital supply chain management system that covers the entire process from raw material procurement and manufacturing to logistics distribution. Through big data analytics and AI algorithms, it achieves accurate demand forecasting, thereby optimizing production planning and inventory management. For instance, leveraging regional and model-specific sales data trends, BYD proactively adjusts component procurement volumes and production schedules, effectively reducing inventory costs while enhancing production efficiency and delivery speed. Furthermore, BYD excels in adopting cutting-edge technologies. Its logistics operations, traditionally reliant on manual labor, are transitioning toward automation and intelligence. BYD Forklift exemplifies this shift through its leadership in smart logistics and material handling, offering a product portfolio ranging from premium lithium-powered forklifts to intelligent AGV solutions. BYD Forklift addresses application scenarios and industry pain points such as material handling, transportation, stacking, and warehousing by deeply integrating new-generation IT (IoT, cloud computing, big data) with intelligent material handling robots. Through comprehensive interconnectivity of personnel, equipment, and objects, it achieves seamless integration with clients' warehouse management systems (WMS) and enterprise resource planning (ERP) systems. This replaces cumbersome, inefficient management models with highly intelligent and automated equipment management systems, significantly enhancing operational efficiency. Therefore, it is clear that the application of digitalization and technology has brought significant benefits to BYD.

Conversely, Jiangsu Chenguang Corrugated Pipe Co., Ltd, a small-scale enterprise, adopts a contrasting approach to digitalization although its underlying reason is obvious. Due to its limited size and capital constraints, the company invests minimally in supply chain digitalization. Its supply chain management relies heavily on manual processes and paper-based workflows, resulting in inefficient, error-prone information transfer. In raw material procurement, unlike BYD’s data-driven platforms for precise demand forecasting and supplier management, Jiangsu Chenguang frequently requires repeated offline negotiations with suppliers to finalize purchase orders. Production planning remains rudimentary, with limited agility to adapt to market fluctuations, leading to inflexible operations and an inability to meet diverse customer demands.

Furthermore, Jiangsu Chenguang allocates minimal resources to R&D, focusing primarily on minor improvements to existing products. Its lack of R&D capabilities in new technologies and materials keeps product value low, leaving it at a competitive disadvantage. For example, when facing stainless steel price volatility, the company cannot emulate BYD’s strategy of developing high-performance alternative materials or optimizing production processes to reduce costs. Instead, it passively absorbs cost pressures from market fluctuations. Limited R&D also restricts its ability to expand into new product areas, resulting in a narrow business scope and weak supply chain risk resilience.

In contrast, BYD’s highly digitized supply chain and robust R&D innovation have forged a resilient, adaptable, and competitive supply chain system. During external shocks like the pandemic, BYD rapidly adjusted production plans, optimized supply chain layouts, and swiftly restored capacity to meet market demands. Conversely, Jiangsu Chenguang’s deficiencies in digitalization and R&D leave its supply chain vulnerable to risks such as material price fluctuations and shifting market needs. This often leads to cost escalation, delayed order fulfillment, and significant threats to business sustainability. Analyzing the root causes of these

differences, two key factors emerge:

(1) Differences in Enterprise Scale and Resources

As a large manufacturing enterprise, BYD possesses robust financial strength and abundant talent resources, enabling substantial investments in digital infrastructure and R&D innovation. Li Yunfei, General Manager of Brand and Public Relations at BYD Group, stated that besides clear strategic planning, vertical technology integration capabilities further propel BYD's global expansion. The company has built the world's most comprehensive new energy industry chain, spanning batteries, motors, electronic controls, and chips. Data shows BYD's per-vehicle costs are 15%-20% lower than competing products, with R&D intensity reaching 6.9%-surpassing Tesla's 4.5%. Its Cell-to-Body (CTB) battery integration technology boosts volumetric efficiency to 66%, forming a technological "moat." To date, BYD has invested over 190 billion yuan in cumulative R&D and employs 120,000 technical engineers[8]. In contrast, small enterprises like Jiangsu Bellows Company face constraints due to limited capital and talent, struggling to afford high costs associated with digital transformation and R&D. Consequently, their emphasis and investment in supply chain digitalization and innovation.

(2) Divergent Market Competition Environment

Moving forward, as market competition intensifies and digital technologies proliferate, small manufacturers seeking improved resilience and competitiveness should incrementally increase digital/R&D investments, explore tailored transformation pathways, and strengthen collaborations with universities/research institutions to boost innovation capabilities-enabling effective responses to volatile markets and supply chain risks. BYD operates in fiercely competitive sectors like new energy vehicles, where technological iterations accelerate, and market demands shift rapidly. To maintain leadership, continuous R&D investments for new products/technologies and digital-driven supply chain agility are imperative. Conversely, Jiangsu Bellows Company operates in a relatively stable market with homogeneous products, leading to insufficient urgency in digitalization and innovation. Such enterprises predominantly rely on traditional cost control and experiential management, reflecting the survival challenges of many small-scale local manufacturers.

In summary, disparities in supply chain digitalization and R&D investment among manufacturers stem from factors including enterprise scale, resource endowments, and market competition dynamics. Large firms like BYD leverage financial and technological advantages to actively pursue digitalization and innovation, achieving enhanced competitiveness and supply chain resilience. Meanwhile, small enterprises constrained by resources remain dependent on traditional practices, facing hurdles in digital transformation and technological advancement. And in the research on the path of digital transformation, Ma Liang, Hu Haolin, et al. (2023) hold that the human capital level, R&D capacity, and the development degree of digital finance of small and medium-sized enterprises, as well as factors such as fiscal support, competitive environment, and investment environment, do not alone constitute the sufficient and necessary conditions for transformation[9]. However, a collaborative path formed by a proactive government, enterprising enterprises, and an effective market can enhance their level of digital transformation. The digital transformation of small and medium-sized enterprises should be based on their own environment and endowments to choose the transformation path.

Kong Lingyi (2024) holds that in the process of further promoting the digital transformation of small and medium-sized enterprises (SMEs), the government needs to increase investment in human resources, funds, and technological innovation, and formulate and improve science and technology policies. On the one hand, it should encourage SMEs to widely apply cloud computing, artificial intelligence, and big data technologies, and integrate them into all aspects of R&D design and business management. On the other hand, it should provide sufficient platforms and public support to meet the digital transformation needs of SMEs[10]. Meanwhile, local governments should encourage financial institutions to expand and enrich their product services, providing financial and capital support for the digital transformation of SMEs and improving the availability of financing. Additionally, the government can stimulate the intrinsic motivation of SMEs for digital transformation through models such as digital transformation subsidies, funds, and special funds. Small and medium-sized enterprises

should also change their mindset and formulate development strategies and goals with a digital mindset. They should enhance the educational qualifications of their senior management and grant them certain decision-making powers, pay attention to technological and R&D investment, and improve their own technological innovation capabilities, converting them into competitiveness and development power. They should actively promote digital transformation and achieve high-quality development. On this basis, small and medium-sized enterprises should also continuously expand their scale of development, enhance their technological innovation capabilities, focus on cultivating and introducing digital technology talents, increase investment in R&D, lay a solid foundation for the digital transformation of enterprises, and help themselves successfully transform in the digital trend.

And in the field of new energy vehicles, BYD has been actively exploring and innovating in supply chain finance, which has become a new engine for enhancing supply chain resilience. BYD has established extensive partnerships with financial institutions to create a comprehensive supply chain finance ecosystem. This ecosystem offers a variety of financial products and services tailored to the specific needs of suppliers at different stages of the supply chain. For instance, in addition to accounts-receivable-based secured loans, BYD has introduced purchase-order-based financing. This allows suppliers to obtain financial support based on purchase orders from BYD, enabling them to prepare raw materials and produce goods in advance, even before delivery. This is particularly beneficial for small and medium-sized suppliers who often struggle with tight funding.

Similarly, BYD's supply chain finance platform is powered by cutting-edge technologies such as blockchain and big data. The platform ensures the authenticity and immutability of transaction information through blockchain technology. Each transaction record is encrypted and stored across multiple nodes, forming a tamper-proof distributed ledger. This not only effectively prevents fraud and malpractice but also provides financial institutions with highly reliable data support, reducing their risk of defaults.

Big data analytics enables the platform to conduct in-depth credit assessments of suppliers. By collecting and analyzing a large amount of data, including transaction history, production capacity, and financial status, the platform accurately evaluates the creditworthiness of suppliers. This allows financial institutions to provide more precise and personalized financing solutions, improving the efficiency of resource allocation and ensuring that funds flow to suppliers with genuine needs and growth potential. BYD's supply chain finance initiatives have brought significant benefits to the entire supply chain. For small and medium-sized suppliers, these initiatives not only alleviate financial pressure but also enhance their market competitiveness and operational stability. By ensuring timely funding, suppliers can maintain stable production, meet delivery requirements, and strengthen their long – term partnership with BYD. For the entire supply chain, these efforts improve capital flow efficiency, reduce financial risks, and enhance overall stability and resilience. In the face of market fluctuations and external shocks, a stable financial supply chain can quickly recover and adapt, ensuring the continuity and reliability of the supply chain.

BYD's supply chain finance innovations, backed by advanced technologies and strategic partnerships with financial institutions, have significantly enhanced the resilience of its supply chain. This has provided strong financial support for the sustainable development of the entire new energy vehicle industry.

4. Discussion

After comparing and analyzing these two core issues by 7 companies, I set up examples of companies with strong supply chain resilience (BYD, Huawei). Although they are in different industries and environments, their advantages in supply chain resilience will inevitably make them deal well in some core areas and key elements.

By conducting a series of interviews and searching through papers, we find that many scholars have conducted extensive research on the resilience of industrial chains and proposed various methods for assessing and enhancing resilience nowadays. As mentioned in the previous literature review, an index system for measuring the resilience of the industrial chain can be constructed from four aspects: resistance capacity, recovery capacity, evolutionary capacity, and government power.

In addition, in the article "Research on Strengthening and Supplementing Supply Chain

Strategies Under the Context of High-Quality Development "the Central Economic Work Conference emphasized the need to "prioritize both development and security in industrial policies" and "strengthen weak links in industrial chains." To this end, Chinese government meetings have identified "enhancing independent control capabilities of key industrial chains" as a key task for 2023. It explicitly proposed focusing on key manufacturing industrial chains to identify critical weak links in core technologies and components where "chokepoint" issues exist, advancing chain strengthening, supplementation, and stabilization through a "one chain, one policy" approach. This involves reinforcing collaboration between upstream and downstream sectors of industrial chains, promoting joint research efforts among large, medium, and small enterprises, and driving comprehensive industrial chain development.

To enhance industrial chain resilience, it is essential to strengthen collaborative innovation across industrial chains. This includes encouraging leading enterprises to form innovation consortiums that drive technological breakthroughs through practical applications while using innovation to boost real-world implementation, with special emphasis on overcoming critical "chokepoint" technologies and product challenges.

After reviewing these several relevant academic papers and selecting the main factors suitable for the manufacturing industry, I try to classify the determinants of supply chain resilience into four elements: Autonomous control capabilities, Industrial diversity, adjustment and response ability and government support.

4.1 Autonomous Control Capabilities

It refers to the capacity to rely on self-developed design and fully master the core technologies of products, which are widely applied in multiple fields, especially in the technology and industrial sectors. It is a systemic approach to technological sovereignty in supply chain management, particularly crucial in strategic industries susceptible to geopolitical disruptions. This capability framework encompasses three interdependent layers: foundational R&D competence, vertically integrated manufacturing ecosystems, and closed-loop intellectual property management systems. BYD's development trajectory exemplifies this paradigm – from pioneering iron- phosphate battery chemistry to establishing complete electric vehicle propulsion system architectures, the company has methodically internalized critical technological nodes. Such technological encapsulation creates self-reinforcing innovation cycles where breakthroughs in battery cell design (e.g., blade battery structural innovations) directly inform vehicle platform optimization, effectively avoid the problems caused by external technical disruptions.

Lyu Yue (2023) proposed in her research on the resilience of the automotive industry chain that in the post-pandemic era as well, concerns over the safety of the automotive industry chain have gradually increased, with an ever-stronger emphasis on the independent control of key core technologies[11]. Besides, at present, the headwinds of globalization and geopolitical conflicts are superimposed, the obstruction of multilateral system reform is intertwined with the competition of rules in emerging fields, and the security of the industrial chain has been raised to an unprecedented new height. Since March 2025, the Trump administration has announced high tariffs and its capricious trade policies, which have led to increased uncertainty in the international market for China's industrial chain. Among these six companies, BYD and Huawei both possess extremely strong capabilities in independently researching and developing core technologies. For instance, BYD's blade battery and IGBT chips mentioned earlier, and Huawei's capabilities ranging from chip design to HarmonyOS to core components. Moreover, they invest a very high amount of money in research and development every year.

For example, BYD's R&D investment in the first half of 2024 reached 20.177 billion yuan, hitting a historical high, with cumulative R&D expenditures exceeding 150 billion yuan and tens of thousands of R&D personnel. This massive investment is key to ensuring the company's technological leadership, with BYD significantly surpassing other Chinese automakers like Li Auto and XPeng in this regard. The scale of R&D commitment and technological autonomy precisely explains why BYD serves as a critical case study in this paper for establishing supply chain resilience evaluation criteria. Therefore, the self-production and self-research capabilities of these two companies can significantly reduce the risk of supply chain disruptions, and they both

have extremely high self-control in the supply chain. This plays a positive role in building a strong supply chain resilience.

4.2 Resistance

There are various explanations of resistance in supply chain. I choose industrial diversity for analysis. In this regard, compared with small manufacturing companies that focus on a single corrugated pipe production, BYD and Huawei and Xiaomi obviously have extremely high industrial richness. BYD started from battery manufacturing and expanded into many fields such as new energy vehicles and electronic manufacturing services. Although Xiaomi and Huawei mainly focus on smartphones, they have made achievements in industrial richness respectively. For Xiaomi's business, the core is the smartphone industry, with products covering various price ranges to meet different users' needs. It also has a smart wearable device sector, such as smart bands and watches, which can monitor health and track exercise. Additionally, Xiaomi's smart home appliances are a significant part of its business, including smart TVs, tablets, laptops, etc., building a smart home ecosystem.

Huawei also has a wide range of businesses. The communication sector is its core, including 5G communication equipment and optical transmission equipment, which provide key support for global communication network construction. In the smartphone industry, despite some challenges, Huawei still holds a share in the high-end market and is actively expanding into the foldable smartphone field. Huawei also has consumer electronic product businesses such as laptops, tablets, and smart wearables. Moreover, Huawei is deeply involved in the enterprise business sector, such as servers and storage devices, offering digital transformation solutions for various industries, and its cloud computing services are also growing, promoting enterprise cloud migration and digitalization. Such industrial diversity significantly enhances the resilience of the supply chain by diversifying across different industries. Such industrial diversification enhances supply chain resilience by reducing reliance on a single industry/product. Amid market fluctuations or supply disruptions, businesses can keep running by relying on multiple industries. This layout allows for flexible resource allocation and risk dispersion. Also, the synergy from diverse industries boosts overall supply chain stability and tenacity. In the face of the stagnation of major automotive industries, BYD is always a good example which was able to achieve profitability during the pandemic by virtue of the production of masks and other industries such as electronic product assembly, charging battery manufacturing and photovoltaic production.

4.3 Adjustment and Response Ability

In supply chain, manufacturing companies need to be capable of responding more quickly and accurately to unexpected events, changes in demand, or market fluctuations and other dynamic environments. In this regard, as mentioned earlier, at the beginning of the epidemic, BYD was aware of the challenges it faced, and soon identified the profit points (masks) that could respond to changes in the market. BYD quickly shifted its production to masks, integrating its upstream and downstream supply chains in a short period of time with quick response and upstream to downstream resource integration. Starting from scratch and conducting cross-industry resource allocation, BYD quickly began to independently develop melt-blown fabric (the core filtering material for masks) and effectively combined self-made equipment with manpower allocation. During several months hard work, BYD became one of the world's largest manufacturers and achieved a profit of two hundred million yuan in just two months. Similarly, in the face of technological blockades and restrictions, Huawei's rapid launch of the HarmonyOS and HI Silicon Kirin chips also demonstrates its strong ability to adjust and respond. Additionally, as a leading enterprise in the global new energy vehicle sector, BYD has adopted a "technology + globalization" dual-drive strategy to establish a manufacturing and supply chain network covering six continents. As of 2024, BYD's global sales volume of 4.27 million vehicles placed it in the fifth position among global automakers. Its factory layout not only supported market expansion but also became an important symbol of "Made in China" going global. From Southeast Asia to South America and Europe, regarding the reason why BYD plans to build production bases in these regions is precisely to avoid the adverse effects brought about by international import and export tariffs. In recent years, the constantly fluctuating and changing customs tariff policies have also forced BYD to seek overseas factory construction. From this, it

is not difficult to observe the adjustment, adaptation and response capabilities of large enterprises. BYD has gradually achieved the leap from "Chinese factories" to "global manufacturing" through local production and technological innovation.

4.4 Government Support

On the other hand, the government support BYD has received constitutes a crucial factor in its emergence as a manufacturing leader as well. As China's leading new energy vehicle (NEV) enterprise, BYD leverages first-mover advantages and synergistic development across its businesses to effectively reduce costs in power batteries and vehicle production, securing a firm foothold in the global NEV sector. With comprehensive product coverage, dominant market share in power battery installations, and outstanding R&D achievements, BYD represents China's prized fully integrated automaker. This qualifies it for national strategic support under China's 13th Five-Year Plan emphasizing low-carbon development and the Made in China 2025 initiative, benefiting from NEV purchase subsidies. Additional support measures include industry-specific tax incentives significantly lower than other sectors, substantial investments in charging infrastructure development with charging station subsidies, and local incentives like Shanghai's free license plate allocation policy.

This demonstrates the Chinese government's comprehensive support for the NEV industry, with BYD receiving particularly substantial assistance as the sector leader. Similarly, Huawei has been positioned as a core player in "new infrastructure" development, with its 5G, cloud computing, and AI initiatives incorporated into the 14th Five-Year Plan. Both companies' policy support aligns with the dual national strategies of "domestic industry revitalization" and "technological self-sufficiency." BYD capitalizes on NEV policies to achieve vertical integration from batteries to vehicles, while Huawei utilizes technology-focused policies to develop autonomous capabilities in critical areas like chips and the HarmonyOS operating system.

Through capital injections, tax incentives, and targeted policy guidance, governments directly alleviate financial burdens on enterprises, enabling them to allocate more resources to R&D innovation, equipment upgrades, and digital transformation. For instance, local governments have implemented VAT reductions and R&D subsidies for new energy vehicle manufacturers. This has allowed companies to intensify investments in battery technology development and automated production line upgrades, enhancing supply chain autonomy and production efficiency. Beyond new energy vehicles, government support for technology projects significantly contributes to building robust supply chain resilience. For example, a semiconductor manufacturer participating in a national key R&D program collaborated with universities to advance chip fabrication technology. The initiative helped overcome critical technological bottlenecks in high-end chip production, achieving domestic substitution and strengthening supply chain security.

Meanwhile, governments must ensure policy stability and continuity to prevent operational uncertainties caused by frequent adjustments. Enterprises should formulate long-term strategies and investment plans while monitoring policy changes. In the new energy vehicle sector, governments have established enduring support measures including sustained purchase subsidies, charging infrastructure plans, and land use policies. This stability provides enterprises with confidence to expand production capacity and optimize supply chain layouts. Through sustained and clear policy incentives, governments guide industrial clustering, fostering collaboration among enterprises and shared infrastructure utilization. Continuous technological innovation and equipment modernization reduce foreign dependency in critical sectors while building alternative supply chains to mitigate international sanction risks. This optimized supply chain ecosystem ensures industrial stability while enhancing resilience through technological self-reliance and cross-sector coordination.

Looking ahead, with the profound adjustment of the global political and economic landscape and the accelerated evolution of the technological revolution, manufacturing enterprises will face a more complex and volatile market environment and more severe supply chain challenges. Enhancing supply chain resilience is not only a strategic requirement for enterprises to cope with external risks and ensure their own survival and development, but also the key for enterprises to stand out in global competition and achieve sustainable development. In the future, the supply chain will accelerate its evolution

towards intelligence, greenness, and collaboration. Manufacturing enterprises must adapt to this trend, make early preparations, increase investment in digitalization and intelligent technologies in the supply chain, and actively explore new models of collaborative cooperation with upstream and downstream enterprises, research institutions, and government departments, etc., to jointly build a more stable and dynamic supply chain ecosystem.

4.5 Comparison of the Six Enterprises

Through a comparative analysis of six enterprises, namely Huawei, BYD (technology-intensive), Foxconn and Xiaomi (contract manufacturing type), and Chenguang (small and medium-sized), the core distinctions in their supply chain resilience strategies are evident and differences in their supply chain resilience strategies can be summarized: Technology giants control key links through vertical integration (such as Huawei's full-stack self-developed chips and BYD's independent "three-electricity" system), and resist systemic risks with high R&D investment. For instance, BYD's blade battery technology not only enhances product safety but also reduces reliance on rare materials, showcasing how R&D-driven strategies build systemic resilience. Technology giants like Huawei and BYD rely on vertical integration to control critical supply chain nodes. Huawei's full-stack self-developed chips and BYD's independent "three-electric" system (battery, motor, electronic control) exemplify how deep vertical integration enables these firms to resist geopolitical risks through technological autonomy. Their high R&D investment, often exceeding tens of billions annually, not only fortifies core competencies but also creates innovation ecosystems that offset external disruptions.

Contract manufacturing enterprises rely on global decentralized layouts (such as Foxconn's multinational factories and Xiaomi's multi-source chip switching) to achieve agile responses, but are constrained by customer dominance, resulting in relatively low profit margins. Small and medium-sized enterprises, on the other hand, leverage local collaborations (such as the Morning Light Joint Procurement Alliance) to alleviate fluctuations in raw materials, but they are confronted with the challenge of balancing profitability and flexibility. The practices of the three types of enterprises reveal that supply chain resilience needs to choose the spectral path of "technology sovereignty-hybrid strategy-agile survival" based on scale and industry characteristics and make up for resource deficiencies through policy support and industrial collaboration.

In contrast, contract manufacturers such as Foxconn and Xiaomi prioritize global decentralized layouts for agility. Foxconn's multinational factory network and Xiaomi's multi-source chip-switching mechanism allow rapid supplier adjustments amid sanctions or shortages. However, their customer-driven business models limit profit margins and expose them to risks like order volatility and regulatory pressures. Xiaomi's ability to switch from Qualcomm to MediaTek chips within weeks mitigates short-term disruptions but relies on established supplier relationships that may falter during geopolitical tensions.

Small and medium sized enterprises like Chenguang adopt localized collaboration strategies. Through joint procurement alliances (e.g., the Morning Light Alliance), they stabilize raw material costs and share inventory risks. Yet these strategies face challenges in balancing short-term cost savings with long-term flexibility, especially during prolonged market fluctuations. While Chenguang's "sharing warehouses" reduce capital tie up, they lack the scale to negotiate favorable long-term contracts, leaving them vulnerable to sudden price spikes.

The divergence in strategies highlights that supply chain resilience must align with enterprise scale and industry risks. Large tech firms pursue "technology sovereignty" through vertical integration, contract manufacturers opt for "agile hybrid" models combining global sourcing with regional production, and SMEs focus on "local ecosystem survival." All three approaches require complementary policy support-such as R&D subsidies for tech giants, tax incentives for global manufacturers, and procurement facilitation for SMEs-to address resource gaps. This spectrum of resilience strategies underscores the need for enterprises to dynamically balance autonomy and flexibility while leveraging industrial collaboration to enhance adaptive capacity in an uncertain global landscape.

5. Conclusion

As Shi Jianxun mentioned in research report, the

continuous improvement of supply chain resilience and security level is the core element and solid foundation for achieving the modernization upgrade of industrial and supply chains and building a new development pattern[12]. Through analyzing the supply chain resilience practices of six manufacturing enterprises, we have identified three core elements of supply chain resilience: Self-control capability, Industrial diversity and Ability of adjustment and response. Whatever Huawei and BYD's independent innovation, Xiaomi and DJI's global layout, or the flexible survival strategies of small workshops, all indicate that supply chain resilience is a key competitiveness for enterprises to cope with uncertainties and achieve sustainable development.

In the future, manufacturing enterprises need to comprehensively utilize means such as technological innovation and digital transformation. They must build a resilient supply chain system adapted to complex environments based on their size and positioning to face the challenges of the future. As the global political and economic landscape undergoes profound adjustments and the technological revolution accelerates, manufacturing enterprises will encounter a more complex and volatile market environment and more severe supply chain challenges. Enhancing supply chain resilience is not only a strategic requirement for enterprises to cope with external risks and ensure their survival and development but also the key for enterprises to stand out in global competition and achieve sustainable development. The supply chain is evolving towards intelligence, greenness, and collaboration at an accelerated pace. Manufacturing enterprises must adapt to this trend by making early preparations and increasing investment in digital and intelligent technologies within the supply chain. They should actively explore new models of collaborative cooperation with upstream and downstream enterprises, research institutions, and government departments to jointly build a more stable and dynamic supply chain ecosystem. Additionally, enterprises need to strengthen their awareness of supply chain risk management, establish a comprehensive risk early warning and response mechanism, and enhance their ability to respond to various risks. By doing so, they can ensure the stability and resilience of their supply chains in the complex and ever-changing market environment, thereby achieving sustainable development.

In summary, supply chain resilience is a dynamic and comprehensive capability that requires enterprises to continuously optimize and enhance it in practice. Enterprises should focus on cultivating self-control capabilities, expanding industrial diversification, and improving adjustment and response abilities. Meanwhile, they should actively seek government support and policy resources to strengthen supply chain resilience. Only in this way can enterprises effectively respond to various supply chain risks and challenges in the post-epidemic era, achieve stable development in the global market, and ultimately realize sustainable growth.

References

[1] Xiong, J., Sun, T., & Wang, L. (2025). Logistics supply chain resilience: Conceptual evolution, research status and prospects. Logistics Sci-Tech, 48(2), 134-140.

[2] Wang, Z., Tang, Y., Han, Z., & Wang, Y. (2022). Measurement of the resilience of the marine vessel industry chain in China's coastal provinces and its influencing factors. Economic Geography, 42(7), 117-125.

[3] Duan, H. (2020). The stress test of the resilience of China's industrial chain caused by the COVID-19 Pandemic and the response measures. China Industry & Information Technology, (3), 94-96.

[4] Han, X., & Yuan, H. (2023). Analysis of the investment value of new energy vehicles-taking byd as an example. Modern Business, (19), 19-22.

[5] Chen, L. (2022). Analysis of strategic management of listed companies: A case study of byd company. China Circulation Economy, (29), 22-25.

[6] Wu, L., Wang, R., & Xiao, H. (2025). The impact of government subsidies on the financial performance of new energy vehicle enterprises: A case study of byd company. Modern Business, (1), 185-188.

[7] Liang, J. (2025). Huawei's path of independently breaking through sanctions: A growth reference for high-tech enterprises in the new era. Enterprises in Hebei, (4), 21-24.

[8] Zhao, Y. (2025). Interview with Li Yunfei of BYD: Overseas sales target of 800,000 units in 2025. China Business Journal, C08.

[9] Ma, L., Hu, H., & Li, Y. (2023). Exploration

of digital transformation paths for small and medium-sized enterprises: Based on nca and fsqca methods. Finance and Accounting Monthly, 44(17), 152-160.

[10] Kong, L. (2024). Digital transformation and development of small and medium-sized enterprises from the perspective of digital economy. China Journal of Commerce, 33(17), 43-46.

[11] Lv, Y., & Chen, Y. (2025). Analysis of the trend of China's industrial chain transfer and countermeasures under the background of global industrial chain reconstruction. Modern Finance Guide, (5), 20-23.

[12] Shi, J., & Lu, D. (2023). Focus on enhancing the resilience and security level of industrial and supply chains. Research on Financial and Economic Issues, (2), 3-13.

