

Analysis of China's B2C Cross-border Trade from the Supply Chain Perspective



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Abstract: With the rapid expansion of cross-border e-commerce, the global trade landscape is undergoing profound restructuring, and traditional trade models are being continuously redefined. Supply chain management has become a core driver for the globalization and high-quality development of China's B2C cross-border e-commerce. From a supply chain perspective, this paper systematically analyzes the current development status and key challenges of China's B2C cross-border trade, covering uneven logistics infrastructure, cross-border regulatory discrepancies, global market uncertainties, and insufficient application of intelligent technologies. It further explores enterprise competitive strategies in global competition, including digital transformation, overseas warehouse deployment, and localized supply chain optimization for small-language markets such as Latin America and Southeast Asia. This study proposes innovative paths for supply chain upgrading by integrating AI, big data, and blockchain to improve operational agility, transparency and stability. In addition, it puts forward targeted policy recommendations to enhance supply chain efficiency, resilience and risk resistance. The findings provide valuable theoretical support and practical references for Chinese B2C cross-border e-commerce enterprises to achieve sustainable development and enhance long-term global competitiveness.

Keywords: B2C; Cross-border E-commerce; Digital Transformation; Small-language Markets;
Supply Chain Management

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1 Introduction

With the rapid expansion of cross-border e-commerce, the global trade landscape is undergoing profound transformation, and traditional trade models are being redefined. Supply chain management has become a key driver in advancing the globalization of China's B2C cross-border e-commerce. From a supply chain perspective, this paper analyzes the current status and challenges of China's B2C cross-border trade, explores corporate strategies in global competition, and offers innovative approaches to supply chain transformation in response to a complex international market and evolving consumer demands.

2 Literature Review

1) Emergence and Development of the B2C Cross-Border E-Commerce Model

In recent years, the Business-to-Consumer (B2C) model in cross-border e-commerce has grown significantly. Unlike traditional international trade, which typically involves multiple intermediaries, the B2C model connects sellers directly with consumers, streamlining transactions and reducing costs. Existing studies have shown that the rise of the B2C model has reshaped international trade, while improvements in logistics and payment systems have greatly enhanced product circulation efficiency [1, 2]. However, some scholars also point out that despite improvements in consumer experience, B2C cross-border e-commerce still

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faces logistics delays, payment barriers, regulatory inconsistencies, and cultural differences [2, 3]. Therefore, effective supply chain management is critical for overcoming these constraints. Enterprises need to rely on technological innovation and supply chain optimization to sustain growth.

2) The Role of Supply Chain Management in B2C Cross-Border E-Commerce

The success of B2C cross-border e-commerce depends not only on platform development but also on efficient supply chain management. Existing studies suggest that integrated supply chain management can improve logistics efficiency, reduce operating costs, and enhance customer satisfaction [4-6]. In addition, digital transformation has significantly improved supply chain capabilities [4, 7, 8]. Technologies such as information systems, data analytics, and digital coordination tools enable firms to conduct demand forecasting, optimize inventory, and respond more quickly to market changes. These tools help cross-border e-commerce firms better cope with uncertainty and complexity in global markets.

3) Intelligent Evolution of the B2C Supply Chain

With the rapid development of artificial intelligence (AI), the Internet of Things (IoT), and blockchain, B2C cross-border supply chains are moving toward intelligent operations. Existing research indicates that intelligent technologies can improve order processing efficiency, reduce human error, and strengthen operational performance [4, 7, 9]. At the same time, blockchain technology can enhance transparency and traceability in supply chains. By recording transaction and logistics information across multiple stages, blockchain helps improve consumer trust and reduce the risks of data tampering and fraud [10-12].

Technology Adoption in Cross-Border E-Commerce Supply Chain

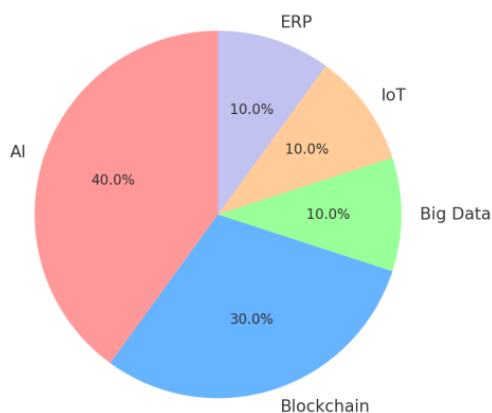


Figure 1 Technology adoption in cross-border e-commerce supply chain

4) Interaction Between Small-Language Markets and Supply Chains

As global consumption becomes more diversified, cross-border e-commerce firms are increasingly entering emerging markets and small-language markets. Existing studies suggest that such markets present both growth opportunities and significant operational challenges, especially in logistics, localization, and infrastructure [3, 13]. To improve competitiveness in these markets, firms need to provide localized products and services while optimizing their supply chains for faster response. By establishing overseas warehouses and localized logistics networks, companies can reduce delivery times and transportation costs and thereby enhance market competitiveness [13].

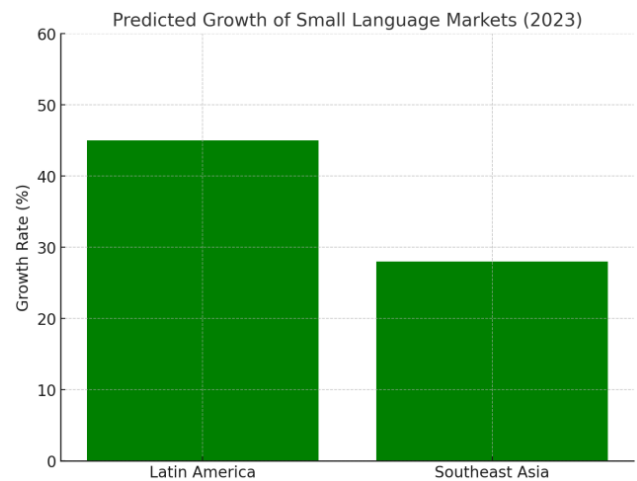


Figure 2 Predicted growth of small language markets (2023)

5) Research Gaps and Future Directions

Despite the growing body of research on B2C e-commerce and supply chain management, notable gaps remain. First, studies on intelligent supply chains in emerging markets like Latin America and Southeast Asia are still limited. Second, while technological applications in supply chains are well-discussed, few address how to mitigate international uncertainty or balance globalization with localization strategies. Future research should focus on:

- 1). advanced applications of intelligent technologies in inventory management, demand forecasting, and route optimization;
- 2). supply chain challenges in regions with underdeveloped infrastructure, and how innovation can enhance service quality and logistics efficiency.

3 Empirical Analysis

1) Current Status of China's B2C Cross-Border E-Commerce

According to relevant reports on China's cross-border e-commerce development, China's cross-border e-commerce sector has maintained rapid growth in recent years, and the B2C segment has expanded steadily. Since 2014, continuous improvements in logistics, warehousing, and digital infrastructure have provided strong support for the rapid development of the B2C sector. With the ongoing optimization of supply chain management by e-commerce platforms, cross-border e-commerce enterprises have made notable progress in international logistics and warehousing, which has helped improve operational efficiency and reduce delivery costs [4, 6, 13, 14]. Overall, China's B2C cross-border e-commerce has entered a stage of steady expansion, supported by platform development, logistics upgrading, and supply chain optimization [3].

For instance, AliExpress launched its overseas warehouse system in 2017, leading to a 35% reduction in average delivery time and enabling faster global consumer response. However, challenges remain, particularly in emerging markets such as Latin America and Southeast Asia, where underdeveloped infrastructure and high transportation costs hinder efficiency. In response, platforms are investing in localized logistics networks and overseas warehouse facilities to improve operational responsiveness and supply chain performance.

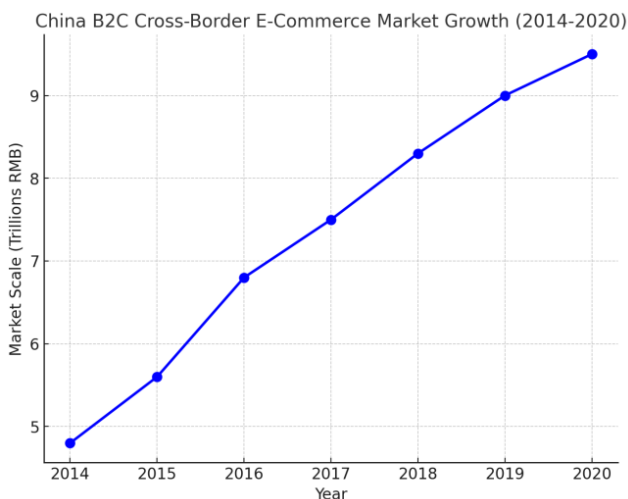


Figure 3 China B2C cross-border e-commerce market growth (2014-2020)

2) The Critical Role of Supply Chain Management

The B2C cross-border model increasingly relies on digital technologies and global logistics infrastructure. Alibaba's Cainiao Network exemplifies best practices, using smart warehousing and route optimization to boost operational efficiency and reduce logistics costs. According to data from AliExpress, the introduction of overseas warehouses in 2017 led to a 35% improvement in delivery speed and a significant drop in logistics expenses through localized warehousing.

With digitalization, supply chain management has undergone a full-scale upgrade. The integration of ERP (Enterprise Resource Planning), WMS (Warehouse Management System), and OMS (Order Management System) allows for real-time tracking of inventory, orders, and supplier coordination. These technologies improve supply chain agility, reduce inventory turnover times, and enhance market competitiveness.

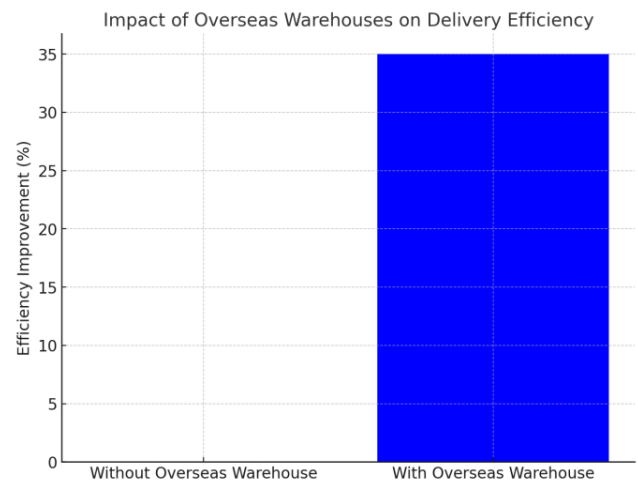


Figure 4 Impact of overseas warehouses on delivery efficiency

3) Expansion into Small-Language Markets and Supply Chain Optimization

Emerging regions such as Latin America, the Middle East, and Southeast Asia are becoming focal points for Chinese cross-border e-commerce. Platforms like Mercado Libre—Latin America's largest e-commerce marketplace—serve as crucial entry points for Chinese sellers. In 2023, the cross-border e-commerce volume in Latin America exceeded \$300 billion, with projections indicating 28% growth by 2027.

By deploying overseas warehouses and localized logistics networks in Latin America and other emerging markets, cross-border e-commerce platforms have improved delivery efficiency and shortened fulfillment time [13]. Meanwhile, Southeast Asia has become a strategic priority for

many cross-border e-commerce firms because of the rapid growth of its digital economy and e-commerce market. Relevant reports show that Southeast Asia's internet economy and e-commerce sector maintained strong growth momentum in 2021 and were expected to continue expanding in the following years. Through localized logistics and warehousing services, platforms can enhance supply chain efficiency in these regions and accelerate market penetration [13].

4) Application of Digitalization and AI in Supply Chains

Technological advancement has positioned digitalization and artificial intelligence (AI) as central to modern B2C supply chains. AI-powered demand forecasting helps platforms adjust inventory and logistics in real time [7, 8, 15]. For example, Amazon uses AI to dynamically manage global inventory and routing, improving delivery speed during peak seasons and reducing transportation costs by 15-20%.

Blockchain is also increasingly adopted in cross-border supply chains, providing immutable transaction records that enhance transparency and credibility. In logistics, blockchain ensures traceability at every stage, preventing data tampering and fraud, and reinforcing consumer trust.

5) Challenges and Strategic Responses in Cross-Border E-Commerce Supply Chains

Despite significant progress, B2C cross-border supply chains face several challenges. Logistics timeliness remains a concern due to infrastructure disparities across countries. Additionally, tariffs, regulatory uncertainty, and compliance issues in international trade present ongoing obstacles [9].

To address these issues, enterprises should expand their global logistics networks, invest in overseas warehouses, and enhance their use of AI, big data, and blockchain to improve supply chain efficiency. Moreover, collaboration with local governments to streamline customs processes and reduce trade barriers is essential for ensuring faster market access.

4 Conclusion

This study indicates that China's cross-border e-commerce is transitioning from rapid expansion to high-quality development. The evolution of the industry—from inception and early-stage growth to rapid expansion and maturity—reveals two notable trends:

First, the B2C model is steadily gaining ground within the B2B-dominated landscape, serving as a critical force in

driving consumption upgrades and brand globalization.

Second, market focus is shifting from traditional Western markets to emerging regions such as Latin America and Southeast Asia, resulting in a more diversified geographic distribution.

Efficient and intelligent supply chain management underpins the success of the B2C model. The integration of digital systems—such as ERP, WMS, and OMS—along with smart warehousing and flexible logistics technologies, has significantly enhanced operational performance and responsiveness. Enterprises should continue to advance brand internationalization by optimizing global logistics networks and employing culturally adaptive strategies to strengthen global brand recognition and trust.

Nevertheless, both external uncertainties (e.g., geopolitical tensions, China-U.S. trade frictions, global economic fluctuations) and internal structural challenges (e.g., limited technological innovation, talent shortages, weak intellectual property protection) may hinder further development. To address these challenges, China's cross-border e-commerce must embrace a supply chain transformation characterized by digitalization, intelligence, localization, and sustainability—shifting from quantitative expansion to qualitative advancement.

Future research may explore the practical impact of emerging technologies—such as AI, blockchain, and big data analytics—on supply chain transparency, flexibility, and sustainability. Green supply chain development will also be critical for meeting carbon reduction goals, involving low-carbon transportation, eco-friendly packaging, and recyclable logistics systems.

In light of global supply chain restructuring and regional industrial shifts, enterprises must not only consolidate domestic manufacturing advantages but also establish overseas supply chain nodes to enhance resilience and global coordination. Continuous innovation in key supply chain segments will be essential for maintaining long-term competitiveness in the global cross-border e-commerce arena.

Author Contributions

Wenran Zhao designed the study, conducted data collection and analysis, and wrote the manuscript.

Conflict of Interest

The authors declare no conflict of interest.

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