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Reshaping Global Supply Chain Resilience via Deepening Regional Trade Agreements: Mechanisms and Pathways

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ABSTRACT
Regional trade agreements (RTAs) represent a critical mechanism for advancing global economic cooperation and fostering high-quality economic development. This paper examines the current state of RTAs, focusing on their impact on the resilience of global supply chains, as well as the mechanisms and pathways for enhancing this resilience. The study finds that the deepening of RTAs significantly strengthens global supply chain resilience by reducing transaction costs, stimulating market competition that drives technological innovation, and enhancing the depth of global trade networks. In response to the trend of the networked development of RTAs, it is essential to actively engage with and establish high-standard regional trade rules to address global supply chain crises. This paper provides theoretical evidence for optimizing regional business environments and enhancing global supply chain resilience through institutional openness.

KEYWORDS
Regional trade agreements; Transaction cost; Supply chain; Resilience

1 Introduction

With the signing of the Indo-Pacific Economic Framework (IPEF) and the escalating trade frictions, global supply chains are undergoing a rapid transformation from the traditional "efficiency-first" model to one prioritizing "security and stability." This shift is characterized by a pronounced trend toward regionalization and localization, while uncertainty in the external environment has significantly increased. Currently, the multilateral trade system under the World Trade Organization (WTO) framework is facing challenges from anti-globalization forces, and regional trade agreements (RTAs) have gradually become the key vehicle for deepening regional division of labor and cooperation. RTAs are not only reshaping the global network of trade agreements but also serving as stabilizers to buffer external shocks and dampen the volatility of supply chains. In this context, exploring the mechanisms through which RTAs enhance global supply chain resilience and the pathways to improving supply chain stability is of significant theoretical and practical value, particularly in terms of mitigating the risk of supply chain disruptions through regional cooperation and constructing a higher level of openness in global trade.

2 Literature Review and Current Status of Regional Trade Agreements

With the deepening development of regional trade agreements (RTAs), their scope has undergone profound changes, evolving from traditional issues such as tariff reductions and rules of origin to encompass a broader range of topics, including technical standards, intellectual property protection, e-commerce regulations, competition policy, and legal safeguards. Particularly, the inclusion of high-standard digital trade provisions such as market access and cross-border data flow has significantly reduced the institutional costs of cross-border economic activities. In recent years, the number of RTAs signed has steadily increased, and the deepening of the RTA network is exhibiting significant characteristics of both horizontal expansion and vertical extension. According to the WTO-RTA database, by 2026, the total number of independent agreements in force globally reached 381. Meanwhile, data from China's Free Trade Area Service Network indicates that by 2026, China had signed 24 free trade agreements with 31 countries or regions. This not only reflects the formation of a complex global RTA network but also signifies China's deep integration and active reshaping of regional trade and economic networks. The rapid increase in the number of bilateral trade agreements and the "fragmentation" of trade rule systems have triggered the "spaghetti bowl" effect, raising transaction costs. However, large-scale RTAs such as the Regional Comprehensive Economic Partnership (RCEP), by coordinating trade rules while taking into account the economic development levels of member countries, have effectively promoted the scaling down of transaction costs, significantly enhancing trade convenience and efficiency.

According to data from the World Trade Organization (WTO), trade in intermediate goods has long accounted for over 50% of global merchandise trade. Although this share dropped to 48.5% in 2023, trade in intermediate goods remains a key variable influencing global trade efficiency. The deepening of regional trade agreements (RTAs) not only significantly reduces both tariff and non-tariff barriers in intermediate goods trade (Baier et al., 2019), but also contributes to improving consumer welfare (Antras and Staiger, 2012), while mitigating the negative effects of trade frictions. Amid increasing uncertainty, although existing research has begun to focus on global supply chain resilience (Bai and Zhang, 2025), and some studies have gradually examined the impact of RTAs on global supply chain stability (Li et al., 2025),

there is still a lack of in-depth analysis of the mechanisms through which RTA deepening affects global supply chain resilience.

3 The Impact of Regional Trade Agreements on Global Supply Chain Resilience

3.1 Regional Trade Agreements, Transaction Costs, and Supply Chain Resilience

The scope of regional trade agreement (RTA) rules has expanded from traditional tariff reductions to include provisions on intellectual property protection, cross-border data flow, and other aspects. The deepening of RTAs is promoting the free flow of transnational resources by reducing both tariff costs and institutional non-tariff barriers. The specific mechanisms through which these effects occur are as follows: First, tariff cost reduction. The tariff concession provisions in RTAs set agreed-upon tariff rates, thereby reducing the tariff costs on intermediate goods trade between countries and enhancing cooperation efficiency. Second, reducing information search costs. The deepening of RTAs has optimized the institutional environment for regional economic cooperation. On the one hand, RTA provisions on intellectual property protection and cross-border data flow alleviate information asymmetries between trading parties, lowering the costs of finding partners and potential legal disputes, thus reducing communication costs. On the other hand, provisions on market access and tariff concessions increase the number of tradable products for businesses in member countries, lowering search costs and improving supply-demand matching efficiency. Third, reducing cross-border clearance costs. Trade facilitation provisions simplify administrative approvals and customs procedures, shortening clearance times, improving logistics efficiency, and reducing trade costs related to cross-border transportation.

In summary, the deepening of RTAs effectively offsets the transaction cost amplification effects caused by the multiple cross-border movements of intermediate goods, promoting the free and efficient transnational flow of intermediate goods（Ma et al., 2025）. The reduction in transaction costs enables multinational companies to allocate more resources to technological innovation and the continuous expansion of production scales, significantly enhancing the risk resilience of global supply chains（Hummels, 2013）. This also implies that, in promoting the construction of high-standard free trade zones, China should focus not only on eliminating tariff barriers but also on addressing non-tariff barriers.

Based on this, this paper proposes Hypothesis 1:

RTAs enhance global supply chain resilience by reducing transaction costs.

3.2 Regional Trade Agreements, Market Competition, and Supply Chain Resilience

Provisions within RTAs, such as those on intellectual property (IP) and cross-border data flow, contribute to the optimization of the market competition environment, thereby fostering an ecosystem in which competition drives technological innovation. The mechanisms through which this effect occurs are as follows: First, IP provisions improve the market competition environment. The IP protection and anti-unfair competition clauses in RTAs compel firms that rely on piracy, infringement, or low-quality competition to exit the transnational market, thereby optimizing the competitive landscape. Second, provisions on cross-border data flow and IP protection intensify market competition. On one hand, stringent rules regarding data movement and IP protection reduce the number of pirated or infringing goods, thereby improving the business environment and attracting more high-quality firms from member countries, which in turn intensifies market competition. On the other hand, tariff concessions and market access provisions lower the tariff and search costs for member-country businesses (Yu et al., 2024), enabling them to access a broader range of products at more competitive prices. However, while these cost reductions benefit businesses, they also expose them to more intense price and quality competition. Furthermore, provisions related to technology, education, and training accelerate the free cross-border movement of innovative factors and highly skilled talent. While this enhances technological spillover effects, it also further intensifies market competition. Third, market competition serves as a driver for technological innovation. The fierce competition in the market forces businesses to increase their investment in research and development, leading them to break through key technological barriers through independent innovation. This ongoing innovation enables firms to create technological advantages to meet the diverse demands of the market. This market-driven push for innovation not only addresses dependency on critical technologies and mitigates supply chain disruption risks, but it also forces firms with lower supply chain resilience to exit the market, ultimately strengthening the overall resilience and risk management capacity of global supply chains.

Based on this, this paper proposes Hypothesis 2: RTAs enhance technological innovation through market competition, thereby strengthening global supply chain resilience.

3.3 Regional Trade Agreements, Global Production Network Depth, and Supply Chain Resilience

RTAs reduce cross-border tariff and non-tariff barriers, significantly enhancing the depth of global production networks. This effect is manifested in the following ways: First, tariff cost reduction strengthens the depth of global production networks. As RTAs continue to deepen along vertical chains, they substantially alleviate the amplification and accumulation effects of transaction costs, such as tariff and compliance costs, caused by multiple cross-border exchanges of intermediate goods. This improves resource allocation efficiency, enabling countries to leverage their comparative advantages and deeply embed themselves in the vertical specialized divisions of global production networks, thus

promoting the formation of a multi-node global production network system. Second, the optimization of the institutional environment enhances the depth of global production networks. On the one hand, high-standard international trade rules established by RTAs effectively reduce information asymmetry between trading parties, facilitating not only the collaborative development of regional supply chains but also helping countries deeply integrate into the global production system. On the other hand, particularly for countries occupying lower positions in the global value chain, provisions on market access, intellectual property protection, data flow, competition policy, and investment facilitation within RTAs effectively address and optimize their domestic institutional environments, promoting the free cross-border movement of production resources, and enabling them to ascend toward the core of global production networks. Third, the synergy between RTA networks and the depth of global production networks contributes to enhancing supply chain resilience. There is a synergistic relationship between signing more high-standard RTAs and deep integration into global production networks. Countries occupying central positions in the RTA network possess superior market resources and influence, often holding key positions in global production networks. By improving their alignment and adaptability, these countries can further enhance supply chain resilience（Wang et al., 2025）. In summary, as countries deepen their integration into global production networks, their connections within global supply chains become increasingly frequent. When a single node faces exogenous shocks or encounters geopolitical risks, such as "friend-shoring," this intricate network allows multinational enterprises to quickly identify alternative nodes, significantly reducing the risks associated with dependence on single sources and thereby strengthening global supply chain resilience.

Based on this, this paper proposes Hypothesis 2: RTAs enhance supply chain resilience by strengthening the depth of global production networks.

4 Conclusion and Implications

Regional trade agreements (RTAs) serve as a critical institutional framework for reshaping global supply chain structures and enhancing global supply chain resilience. This paper reviews the current state of RTAs and delves into the mechanisms through which the deepening of RTAs impacts the resilience of global supply chains. The study finds that the deepening of RTAs strengthens global supply chain resilience by reducing transaction costs, stimulating market competition that drives technological innovation, and enhancing the depth of global production networks. This research offers important insights for promoting the deepening of RTAs and maintaining the stability and security of global supply chains. Based on these findings, the paper presents the following recommendations:

First, leverage the synergistic effects of RCEP and the Belt and Road Initiative (BRI) to deepen the RTA network. By capitalizing on the combined effects of RCEP and the BRI, China can deepen its integration with RCEP member countries and BRI participants at core supply chain nodes. This can be achieved by enhancing the implementation efficiency and quality of regional economic cooperation, constructing an efficient regional division of labor system, and thereby strengthening supply chain resilience.

Second, actively apply for membership in high-standard RTAs. China should seek to join agreements such as the Digital Economy Partnership Agreement (DEPA) and the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). This would increase China's influence within the RTA network through a higher level of openness and significantly enhance the resilience of global supply chains.

Third, establish high-standard regional trade rules. High-standard RTA rules are essential for China's efforts to promote high-level institutional openness. China should align with leading international economic and trade standards, take the initiative in developing high-standard regional trade rules that serve the interests of developing countries, unlock the dividends of regional cooperation, and enhance supply chain resilience and risk management capabilities.

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