

Analysis of the Synergistic Development Pathway of “Cross-Border E-Commerce + Industrial Belts” in Liaoning Province

Hongbo Li

Liaoning University of International Business and Economics, Dalian 116052, Liaoning, China

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: Integrating cross-border e-commerce with industrial belts has become a key pathway for restructuring foreign trade. Liaoning now hosts seven cross-border e-commerce pilot zones, with industrial bases in equipment manufacturing, textiles and apparel, and specialty agricultural products. However, synergy is hampered by limited industrial matching, fragile market actors, uneven regional development, and a talent deficit. This study first reviews existing conditions and key obstacles, then outlines a five-pronged pathway: cultivating market actors, integrating industries, empowering digitally, supporting logistics, and improving collaborative governance. Policy responses are proposed in three areas: policy alignment, platform building, and factor support. These are intended to inform high-quality foreign trade development in Liaoning and Northeast China.

Keywords: Cross-border e-commerce; Industrial belts; Synergistic development; Liaoning Province

Online publication: September 30, 2026

1. Introduction

With the continued expansion of the digital economy, cross-border e-commerce has emerged as a new driver of international trade. Its ability to reach wider markets and reduce cross-border transaction costs has made it an important source of trade growth. In April 2023, the General Office of the State Council issued the *Opinions on Promoting the Stabilization and Optimization of Foreign Trade Structure*. This document called for active development of the “cross-border e-commerce + industrial belts” model and closer links between cross-border e-commerce and specialized industrial clusters. The policy therefore encourages local areas to translate their existing manufacturing bases and locational strengths into momentum for foreign-trade upgrading.

Scholarship in this area has expanded quickly. Three theoretical lenses dominate: co-evolution, factor allocation, and institutional innovation. From a co-evolutionary view, cross-border e-commerce and industrial belts reinforce each other. Their interaction can push industrial belts toward digital, higher-value, and more internationalized production, while helping cross-border e-commerce achieve scale, brand recognition, and

ecosystem upgrading^[1]. Li *et al.*^[2] examined trade digitalization and argued that digital trade can counter price-based “involution” at both ends of the trade process; by complementing labor with data factors, it can also raise labor’s income share. This offers a theoretical basis for improving factor allocation in industrial belts supported by cross-border e-commerce. Industrial belts, for their part, shape regional growth and trade competitiveness by reducing transaction costs, facilitating cooperation, and accelerating knowledge and technology spillovers^[3]. Free trade pilot zones can further reduce barriers to factor movement through institutional innovation, thereby speeding the integration of cross-border e-commerce and industrial clusters^[4].

In terms of practical models, the Academy of CCPIT divides the “cross-border e-commerce + industrial belts” model into emerging, growing, and mature types. Guangdong, Zhejiang, and other coastal provinces have produced notable examples, such as Guangzhou’s one-stop service platform based on “three centers,” Yiwu’s digital trade ecosystem combining AI and big data, and Shenzhen’s approach of “hard-core technology + flexible manufacturing”^[1,5]. Hu *et al.*^[6] proposed that the “cross-border e-commerce + industrial belts” model should be more deeply integrated into the domestic and international dual circulation, with enhanced efforts in independent brand building, overseas warehouse development, and the application of new quality productive forces.

A comprehensive review of the extant literature reveals that regionally focused studies have predominantly concentrated on the developed coastal areas, with systematic investigations into the intrinsic mechanisms and differentiated pathways of the synergistic development of “cross-border e-commerce + industrial belts” in the old industrial base of Northeast China remaining conspicuously absent. There is thus an urgent need to deepen research grounded in Liaoning’s specific realities. This paper, taking Liaoning’s actual conditions as its point of departure, analyzes the current status and challenges of the synergistic development of cross-border e-commerce and industrial belts, explores collaborative development pathways with distinctive Liaoning characteristics, and aims to provide actionable references for local government decision-making and enterprise practice.

2. Current development status of cross-border e-commerce and industrial belts in Liaoning Province

2.1. Robust growth trajectory of cross-border e-commerce

Liaoning’s cross-border e-commerce sector shows three main trends. First, pilot zone construction has advanced in a tiered manner. Seven national comprehensive pilot zones now operate across the province. Shenyang, Dalian, and Yingkou provide full-category supervision, while Anshan, Fushun, Dandong, and Panjin have adopted mainstream regulatory models. This creates a spatial pattern led by Shenyang and Dalian, with coastal and border areas developing in parallel. Dandong’s approval by the State Council in April 2025 raised the provincial total to seven. Second, policy backing has become stronger. A provincial cross-border e-commerce training conference was held in December 2025, signaling clear support for new trade formats. The *Action Plan for Promoting the Accelerated Development of Cross-Border E-Commerce in Liaoning Province (2026–2028)* was released in February 2026. In March 2026, eleven provincial and central departments, including Liaoning’s Department of Commerce and Department of Finance, issued nine supporting measures. Third, the ecosystem is taking shape. In 2025, Liaoning’s cross-border e-commerce imports and exports reached 31.1 billion yuan, up 16.3% year on year, 18.3 percentage points faster than the province’s total goods trade. More than 4,600 cross-border e-commerce entities now operate in the province, supported by integrated service platforms, overseas warehouses, and cross-border logistics facilities.

2.2. Solid foundation of specialty industrial belts

Liaoning has diverse industrial belt resources that can support the “cross-border e-commerce + industrial belts” model. These resources fall into five groups. The first is equipment manufacturing, concentrated in Shenyang and Dalian and covering auto and auto parts, CNC machine tools, and rail transit equipment. The second is textiles and apparel, represented by Xingcheng swimwear, Xiliu garments, and Dalian fashion. The third is specialty agricultural products, including geographical indication items such as Dandong strawberries, Yingkou apples, Zhangzidao seafood, and Panjin rice. The fourth is petrochemicals, with Fushun paraffin wax as a leading example. The fifth is specialty handicrafts, such as Xiuyan jade and Jinzhou quartz singing bowls.

2.3. Practical explorations of cross-border e-commerce empowering industrial belts

Policy support and market demand have begun to produce practical results. First, a full-factor matching platform has been built to connect manufacturing firms with cross-border e-commerce platforms in four priority belts: auto and auto parts, textiles and apparel, building materials and home furnishings, and cultural creativity. Second, Fushun has used its petrochemical strengths to open export channels for paraffin wax and other niche products. Third, the Xingcheng swimwear belt has adopted flexible small-batch, quick-response production, allowing it to meet overseas demand through cross-border e-commerce and complete the export chain from factory to buyer. Fourth, several business-model innovations have emerged: a “9610 + TIR” combined transport service; a 1210 export model developed by Shenyang with JD.com; Dalian’s integration into the SHEIN logistics system, which enables two-hour customs clearance; and Anshan’s use of the 9610 model to export Xiuyan jade to Japan, the Republic of Korea, and Russia.

3. Practical challenges confronting synergistic development

Notwithstanding the proactive explorations undertaken in Liaoning regarding the synergistic development of cross-border e-commerce and industrial belts, several salient problems persist when measured against the benchmarks of advanced provinces and the requirements of high-quality development.

3.1. Insufficient industrial compatibility

Liaoning’s exports still rely heavily on traditional sectors such as equipment manufacturing, metallurgy, and petrochemicals, which together exceed 90% of total export value. These products tend to be bulky, high-value, customized, and dependent on after-sales service. Such features do not fit easily with cross-border e-commerce, which is largely consumer-oriented. The province’s consumer-goods base is also relatively weak: consumer goods account for only about 5% of foreign trade. Sectors that are more compatible with cross-border e-commerce, including light industry, textiles, and daily necessities, remain small in scale and weak in branding, and have not yet reached effective economies of scale. As a result, cross-border e-commerce has not penetrated Liaoning’s industrial belts deeply, limiting the expected synergy.

3.2. Weak business entities

Although Liaoning is home to over 4,600 cross-border e-commerce business entities, only some 2,000 enterprises are actually engaged in substantive import and export operations. The sector is characterized by a conspicuous absence of leading enterprises, with the vast majority consisting of self-operated small, medium, and micro-sized businesses that predominantly participate in cross-border transactions through OEM

manufacturing and white-label production. These firms lack core technologies, proprietary brands, and brand premium capabilities, rendering them vulnerable to market risks and leaving them with limited bargaining power in international trade. Furthermore, traditional foreign trade enterprises in the region exhibit insufficient capacity for “digital upgrading” and online integration, a constraint that has impeded the rapid proliferation of the “cross-border e-commerce + industrial belts” model.

3.3. Pronounced regional disparities

Cross-border e-commerce resources in Liaoning Province are heavily concentrated in the two core cities of Shenyang and Dalian. In 2024, Dalian’s total import and export value reached 449.67 billion yuan, accounting for 58.9% of the province’s total foreign trade; Shenyang’s total import and export value stood at 146.56 billion yuan, representing 19.2% of the provincial total. Together, the two cities contributed nearly 80% of the province’s total foreign trade value. Although the remaining comprehensive pilot zone cities have received official approval for establishment, they continue to lag considerably behind Shenyang and Dalian in terms of platform resources, logistics corridors, and professional services—a gap that has precluded the formation of a “multi-point” synergistic development pattern across the province.

3.4. Insufficient factor support

First, a shortage of interdisciplinary talent persists. Cross-border e-commerce entails a multidisciplinary body of knowledge spanning international trade, e-commerce, foreign languages, logistics management, and data analytics. There exists a discernible misalignment between the relevant program offerings of Liaoning’s higher education institutions and the actual demands of the industry, resulting in an inadequate supply of professionals who possess competencies in both foreign trade and e-commerce. Second, cross-border logistics costs remain prohibitively high. Liaoning has relatively few international air cargo routes, while maritime shipping entails extended transit times—factors that pose significant constraints on products with high perishability or stringent delivery timelines, such as fresh produce. Third, the supply of specialized services—including cross-border finance, intellectual property, and legal advisory services—remains insufficient, leaving small and medium-sized enterprises grappling with numerous difficulties in areas such as cross-border foreign exchange collection and brand protection.

3.5. Deficiencies in collaborative mechanisms

There is a conspicuous absence of regularized docking mechanisms between industrial belt enterprises and cross-border e-commerce platforms. On the one hand, industrial belt enterprises exhibit limited awareness of and engagement with cross-border e-commerce, with information asymmetry constituting a prominent obstacle. On the other hand, cross-border e-commerce platforms lack an in-depth understanding of Liaoning’s industrial belts, and their targeted empowerment measures remain inadequate. Furthermore, the synergistic coordination among multiple stakeholders—including government agencies, platforms, enterprises, and higher education institutions—requires substantial reinforcement, and a concerted impetus for the development of the “cross-border e-commerce + industrial belts” model has yet to be formed.

4. Pathway design for synergistic development

4.1. Expanding cross-border e-commerce business entities

A first step is to enlarge the pool of market participants. Liaoning should court major cross-border platforms—such as Alibaba.com, Amazon, Temu, and TikTok Shop—and encourage them to set up regional headquarters or functional offices so that local services improve. Second, the province should nurture local leaders. Traditional traders and manufacturers with strong foundations and willingness to transform should receive policy incentives, resource matching, and training, with the goal of building benchmark cross-border e-commerce firms with annual sales above 100 million yuan. Liaoning’s “1252” roadmap sets targets of 10 industrial belts, 20 key parks, 50 key firms, and 20 independent brands, giving clear direction. Third, entry barriers should be lowered so that college graduates, returning rural youth, and other groups can start cross-border e-commerce ventures linked to industrial belts.

4.2. Deepening cross-border e-commerce empowerment of industrial belts

Industrial integration is the core of synergy. The province should adopt a “one belt, one policy” approach, designing support measures around each belt’s products, target markets, and bottlenecks. Xingcheng swimwear, for example, can use live-streaming and social commerce to reach overseas consumers; Fushun paraffin wax can focus on B2B cross-border e-commerce; and Dandong can develop customized cross-border channels for its specialty agricultural products and border trade advantages. In addition, platforms should work with belt firms to improve product standards, packaging, and after-sales service so that local products are better suited to online overseas markets.

4.3. Enhancing the digitalization level of industrial belts

Digitalization is essential if industrial belts are to keep pace with cross-border e-commerce. On the production side, firms should be helped to build digital workshops and smart factories. Big-data analysis can support flexible production and on-demand customization, making it easier to handle the small-batch, multi-variety orders common in cross-border e-commerce. By applying a “small-batch, quick-response” logic and mining global consumer data, fragmented market signals can be turned into production instructions. On the marketing side, firms should adopt AI for precision marketing, intelligent customer service, and personalized recommendations to improve overseas expansion. In addition, integrated cross-border e-commerce service platforms should be developed. Customs, logistics, finance, taxation, and foreign exchange services should be brought together to provide one-stop digital support and reduce the overall cost of cross-border operations.

4.4. Facilitating cross-border e-commerce export channels

Efficient logistics is a key safeguard for synergy. First, the international logistics network should be improved. Firms should be supported in building overseas warehouses, and the “overseas warehouse + cross-border e-commerce + industrial belt” model should be promoted so that “front-store, back-warehouse” operations can respond in real time. Second, intermodal corridors should be expanded. Using Liaoning’s port cluster, land-sea intermodal services such as “Dandong Port + Tonghua Land Port” can lower logistics costs for inland belt firms. Shenyang Customs has advanced trade facilitation, and Shenyang has become Northeast China’s only national China-Europe Railway Express hub. Third, low-altitude logistics should be tested. Drones could be piloted for short-distance cross-border transport of fresh agricultural products, shortening delivery time and reducing losses.

4.5. Building a full-chain development ecosystem

Collaborative governance provides the institutional basis for sustained momentum. First, open platforms should be better linked. Cross-border e-commerce pilot zones, free trade pilot zones, comprehensive bonded zones, and economic and technological development zones should coordinate their policies to create synergy. Second, intellectual property protection should be strengthened. A rapid response mechanism for cross-border e-commerce IP disputes should be created, and belt firms should be helped with overseas trademark registration and patent planning.

5. Countermeasures and recommendations

5.1. Improving the policy coordination mechanism

First, a provincial-municipal and interdepartmental policy implementation mechanism should be created. The province should handle overall planning, while municipalities formulate locally adapted rules, forming a system that is vertically connected and horizontally coordinated. Second, policy evaluation and dynamic adjustment should be strengthened. Regular reviews of cross-border e-commerce support policies should be conducted, with timely changes made as industry needs and the international environment evolve. Third, fiscal and financial support should be increased. A dedicated cross-border e-commerce industrial development fund could offer loan interest subsidies and premium subsidies to belt firms engaged in cross-border operations.

5.2. Building a multi-stakeholder collaborative platform

First, a full-factor matchmaking platform should be established. Regular events should connect belt firms with cross-border platforms, logistics providers, financial institutions, universities, and research institutes. Second, a demand feedback mechanism should be built. Industry associations and alliances can periodically collect and synthesize belt firms' cross-border e-commerce needs, producing problem inventories and demand lists for precise service matching. Third, industrial belt cross-border e-commerce alliances should be encouraged. Firms in the same or related belts can cooperate on logistics, marketing, and branding. Collaborative operations centers could be set up in specialty belts such as Xingcheng, Dandong, and Fushun, integrating supply chain, logistics, and marketing resources to provide full-chain services from production to export.

5.3. Strengthening the factor guarantee system

First, a dedicated talent program should be advanced. Liaoning's universities should be encouraged to add cross-border e-commerce majors or concentrations. Industry-academia collaboration can support industrial colleges and training bases that produce graduates with combined skills in "foreign languages + e-commerce" and "foreign trade + digitalization." The provincial departments of education and commerce have already launched training initiatives requiring universities to prioritize such talent cultivation. This should be deepened through a "dual-mentor" system, in which academic and enterprise mentors jointly guide students in product development, customer service, and overseas marketing. Second, cross-border financial services should be improved. Banks and payment institutions should offer belt firms easier cross-border collection, foreign exchange settlement and sales, and supply chain finance, lowering financial barriers for SMEs. Third, IP protection should be reinforced. An early-warning system for cross-border e-commerce IP risks should be established, with professional services for overseas IP planning and infringement response.

6. Conclusion

For Liaoning, aligning cross-border e-commerce with industrial belts is an important way to upgrade foreign trade and deepen RCEP cooperation. This paper shows that Liaoning has a foundation for the “cross-border e-commerce + industrial belts” model, but still faces insufficient industrial compatibility, weak market entities, regional disparities, inadequate factor support, and weak collaboration mechanisms. These issues require a problem-oriented, systematic response in five areas: actor cultivation, industrial integration, digital empowerment, logistics support, and collaborative governance. Policy coordination, multi-stakeholder platforms, and factor guarantee systems should also be strengthened to build momentum for high-quality development of the model. Liaoning should seize this strategic opportunity, build on its industrial base, use its locational advantages, and address its weaknesses to create a distinctive path for cross-border e-commerce and industrial belt synergy, thereby supporting the comprehensive revitalization of Northeast China.

Funding

University-level Scientific Research Project of Liaoning University of International Business and Economics (2025XJLXQN003)

Disclosure statement

The author declares no conflict of interest.

References

- [1] Fan YS, 2026, Analysis on the Development of the “Cross-Border E-Commerce + Specialty Industrial Belts” Model in Henan Province. *Journal of Time Economy*, 23(7): 34–36.
- [2] Sun FR, 2026, Innovative Models and Experiential Insights for the High-Quality Development of “Industrial Belts + Cross-Border E-Commerce.” *National Circulation Economy*, (2): 32–35.
- [3] Li JP, Liu L, Xin DL, 2025, Trade Digitalization and the Enhancement of Labor Income Share: Evidence from the “Cross-Border E-Commerce + Industrial Belts” Model. *Contemporary Finance and Economics*, (12): 129–142.
- [4] Yang Y, Cai LL, Deng S, 2025, Mechanism Analysis of Cross-Border E-Commerce and Industrial Agglomeration Empowering Hunan’s Trade Development with Africa. *Journal of Hunan Open University*, (4): 32–40.
- [5] Xu Y, Zhou HH, 2026, A Strategic Study on the Integrated Enhancement of Cross-Border E-Commerce in Manufacturing Industrial Clusters: A Case Study of Zhejiang Province from the Perspective of Pilot Free Trade Zones. *Northern Economy and Trade*, (7): 106–109.
- [6] Hu KH, Wang H, Wang DW, 2025, Countermeasure Research on the High-Quality Development of China’s “Cross-Border E-Commerce + Industrial Belts” Model. *Customs and Trade Research*, 46(3): 42–52.

Publisher’s note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.