



The Author(s). Published by Global Insight Publishing Ltd, USA.

This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Cross-Border Trade, Industrial Integration, and Regional Connectivity: Inner Mongolia's Contribution to China's Dual Circulation Strategy

Jun Tang¹, Lijun Fan^{*}(Corresponding Author)

Abstract: This study examines the role of Inner Mongolia in advancing China's dual circulation strategy through cross-border trade, industrial integration, and regional connectivity. Drawing on policy documents, trade statistics, and case-based analysis, the research highlights how Inner Mongolia functions as a geostrategic hub within the China–Mongolia–Russia Economic Corridor and a critical node in the Belt and Road Initiative. The findings demonstrate that Inner Mongolia's border advantages, resource endowments, and infrastructural investments enable it to support domestic circulation through industrial upgrading and supply chain resilience, while simultaneously contributing to international circulation via diversified export channels and logistics corridors. The study also explores institutional arrangements, including bonded zones, free trade mechanisms, and cooperative frameworks with Mongolia and Russia, which strengthen the region's integrative capacity. However, challenges such as environmental constraints, resource dependence, and policy coordination gaps persist. The research underscores Inner Mongolia's evolving role as both a frontier of national security and a bridge of international cooperation, offering insights into how border regions can shape China's reconfigured global economic geography.

Keywords: Dual Circulation Strategy; Cross-Border Trade; Industrial Integration; Regional Connectivity; Belt and Road Initiative

I. Introduction

1.1 Research Background.

The Belt and Road Initiative (BRI), launched by China in 2013, is a global development strategy aimed at enhancing regional connectivity and fostering economic collaboration across Asia, Europe, and Africa [1]. Over the years, the BRI has accumulated thousands of projects and trillions of dollars in investments, expanding its cooperation scope to over 150 countries and more than 30 international organizations, thus becoming the largest and most extensive international economic cooperation platform globally [2]. BRI seeks to create a modern Silk Road that facilitates trade, investment, and cultural exchange. According to Yuan Da, Secretary-General of the National Development and Reform Commission, the initiative tightly integrates domestic and international dual circulations, injecting strong momentum into the establishment of a higher-level open economy in China and serving as a vital engine for achieving Chinese-style modernization [3]. The initiative has laid a solid foundation for international cooperation, as highlighted by Guo Xuejun, Deputy Director-General of the Department of International Economic Affairs, who noted the establishment of diverse bilateral cooperation mechanisms. With its "six corridors, six roads, and multiple countries and ports" framework, the BRI has created a "golden passage" for China's opening up. Currently, the China-Europe Railway Express has exceeded 110,000 trips, reaching 229 cities in Europe and over 100 cities in Asia, while the "Maritime Silk Road" includes more than 130 routes, and the aerial "Silk Road" connects 213 cities in 83 countries [4]. In promoting the "hard connectivity" of infrastructure, China is also steadily enhancing the "soft connectivity" of rules and standards. Located along China's northern frontier, the Inner Mongolia Autonomous Region occupies a vast and strategically significant area of 1.183 million square kilometers. Stretching diagonally from northeast to southwest, it borders eight domestic provinces and regions, and shares more than 4,200 kilometers of international boundary with Russia and Mongolia. Its geography is dominated by plateau landscapes, with elevations exceeding 1,000 meters across most of the territory, interspersed with mountains, plains, deserts, and expansive grasslands. The region is also marked by extreme climatic conditions characteristic of a temperate continental monsoon climate, with summer temperatures around 25°C and winter temperatures in some areas dropping below –50°C [5]. These natural features not only define the ecological environment but also shape the patterns of agriculture, animal husbandry, and settlement, positioning Inner Mongolia as both an ecological barrier and a frontier of economic exchange.

¹ Pakistan Research Center, Inner Mongolia Honder College of Arts and Sciences, Hohhot 010070, China. kkkdddsss@163.com.

^{*}Belt and Road Institute, Inner Mongolia Academy of Social Sciences. nmgsyfanlijun@163.com



Figure 1, Location of Inner Mongolia (<https://www.vectorstock.com/royalty-free-vector/inner-mongolia-province-map-china-vector-28773946>)

In addition to its geographic and climatic significance, Inner Mongolia is endowed with abundant and diverse natural resources. It is home to rich reserves of coal, rare earths, and non-ferrous metals, making it one of China's most resource-intensive regions. Its grasslands and farmlands sustain large-scale grain and livestock production, while forest and wetland ecosystems play vital roles in biodiversity conservation and environmental security. With a permanent population of 23.88 million in 2024 and a GDP of 2.63 trillion yuan, Inner Mongolia has become an important contributor to both national energy supply and agricultural output. The combination of extensive land borders,

resource endowments, and ecological functions underscores the region's strategic importance in China's development planning. These attributes provide the structural foundation for Inner Mongolia to serve as a critical hub for cross-border trade, industrial integration, and regional connectivity within the framework of the Belt and Road Initiative and China's dual circulation strategy.

1.2 Research Questions

this study centers on these guiding questions:

- What spatial and institutional mechanisms enable Inner Mongolia to integrate cross-border trade with domestic industrial supply chains?
- In what ways do these mechanisms help achieve synergy between "internal" and "external" circulation envisioned by China's dual circulation strategy?
- What challenges and opportunities arise from Inner Mongolia's role within broader regional and global integration frameworks?

1.3 Objectives of the Study

The main objective of this study is to examine how Inner Mongolia, as China's northern frontier and a key hub of the China–Mongolia–Russia Economic Corridor, contributes to the realization of the national dual circulation strategy. Specifically, it seeks to (1) analyze the mechanisms through which cross-border trade, bonded zones, and transport corridors integrate international and domestic markets; (2) evaluate the role of industrial processing, value-added transformation, and the export of emerging sectors such as the “new three samples” in upgrading regional industries; and (3) assess how improved connectivity reinforces Inner Mongolia's role as a bridgehead linking internal circulation with external circulation. By doing so, the study aims to generate evidence-based insights that can guide policymakers and stakeholders in optimizing regional development strategies while aligning local capacities with national and global economic shifts.

1.4 Theoretical Framework: Dual Circulation Strategy and Regional Integration

The notion of dual circulation can be situated within the broader tradition of political economy that emphasizes the dynamic interaction between domestic development and global economic integration [6]. Rooted in structuralist thought, dual circulation reflects a recalibration of China's growth model in response to global uncertainty, supply chain vulnerabilities, and the reconfiguration of globalization [7]. Rather than decoupling, it advances the idea of “embedded openness”: building stronger domestic demand, indigenous innovation, and resilient industrial chains while continuing to leverage international markets. This framework resonates with theories of import-substitution and export-led growth but integrates them into a hybrid model, where internal and external circulations are not dichotomous but mutually reinforcing. From the lens of regional integration theory, Inner Mongolia's role can be analyzed using functionalist and neo-functionalist perspectives that highlight how economic interdependence and institutional mechanisms foster deeper integration [8]. The creation of border economic cooperation zones, comprehensive bonded areas, and multilateral transport agreements exemplify the gradual spillover effects described in neo-functionalist integration theory. As functional cooperation in logistics, trade facilitation, and industrial processing expands, it generates pressure for broader policy coordination, regulatory alignment, and socio-cultural exchanges with Mongolia and Russia. Thus, Inner Mongolia operates not merely as a peripheral borderland but as a functional node where

economic pragmatism drives incremental integration, consistent with theories that see regionalism as emerging through sectoral linkages rather than grand political design.

The concept of multi-scalar connectivity further enriches this framework, drawing from spatial political economy and network theories. Connectivity is not limited to physical infrastructure but extends to institutional, digital, and financial linkages that reposition regions within global production networks [9]. Inner Mongolia illustrates how a frontier region can accumulate “connectivity capital” by transforming geographic adjacency into economic advantage through corridors such as the China–Europe freight rail and multimodal transport hubs. This aligns with Saskia Sassen’s notion of “strategic geographies” where regions acquire global significance through their capacity to mediate flows of goods, capital, and ideas [10].

II. Literature Review

2.1 Dual Circulation Strategy: Concept and Policy Orientation

The “dual circulation” strategy has emerged as one of the central paradigms of China’s contemporary development model. First articulated in 2020, the concept emphasizes the mutual reinforcement of “internal circulation,” driven by domestic demand, innovation, and industrial self-sufficiency, and “external circulation,” which relies on participation in global trade and investment flows [11]. Scholars have argued that dual circulation reflects a pragmatic response to global uncertainties such as trade disputes, supply chain disruptions, and shifting geopolitical conditions [12]. Rather than advocating decoupling, the framework advances “embedded openness,” whereby China simultaneously strengthens its domestic economic base while remaining integrated with international markets [13]. This dual orientation aligns with structuralist traditions in political economy, where internal development is seen as a prerequisite for external competitiveness. Recent policy documents highlight that the strategy prioritizes indigenous innovation, resource security, and the development of resilient value chains, particularly in energy, technology, and advanced manufacturing [14].

2.2 Cross-Border Trade and Regional Development: Theories and Evidence

Cross-border trade has long been theorized as a catalyst for regional growth, especially in borderland economies that combine geographic proximity with institutional frameworks for exchange. Classical trade theories underscore the role of comparative advantage, while newer approaches emphasize cross-border production networks and the creation of “trade corridors” as engines of development [15]. Evidence from European integration and North American trade demonstrates that border regions can transform from peripheral zones into dynamic growth hubs when supported by infrastructure and institutional cooperation [16]. In China’s case, border provinces such as Yunnan, Xinjiang, and Inner Mongolia have increasingly been positioned as “bridgeheads” of international exchange, serving both national security and economic development goals [17]. Empirical studies show that the establishment of economic cooperation zones and bonded areas at border points reduces transaction costs, stimulates industrial clustering, and facilitates regional integration with neighboring countries [18].

2.3 Industrial Integration and Value Chain Upgrading

Industrial integration refers to the coordinated development of industries across regions, often facilitated by cross-border value chains. For developing economies, integration into global production networks offers opportunities for value chain upgrading, particularly through technology transfer and the development of processing industries [19]. China’s strategy has shifted from being a low-cost assembly hub toward fostering higher value-added activities in advanced manufacturing, digital services, and green technologies [20]. In Inner Mongolia, industrial integration has focused on leveraging resource-intensive sectors—such as coal, rare earths, and animal husbandry—while promoting the transformation of these sectors into globally competitive value chains [21]. Scholars highlight that upgrading requires not only industrial clustering but also supportive institutional mechanisms, including cross-border investment treaties, harmonized standards, and bilateral cooperation agreements [22]. Thus, industrial integration becomes both a national development tool and a regional strategy to enhance borderland economic resilience.

2.4 Regional Connectivity and Infrastructural Linkages

The Belt and Road Initiative (BRI) underscores this dimension by promoting “hard connectivity” through transport and energy networks, and “soft connectivity” through regulatory alignment and digital platforms [23]. International experiences suggest that infrastructure corridors reduce spatial inequality by linking landlocked or peripheral regions to global markets [24]. For Inner Mongolia, infrastructural linkages include rail corridors such as the China–Europe Railway Express, highways such as the China–Mongolia–Russia economic corridor, and emerging air and digital routes [25]. Scholars have described these as forms of “multi-scalar connectivity,” where local development is repositioned within regional and global networks [26]. Infrastructure not only facilitates the flow of goods but also accelerates institutional cooperation, financial integration, and people-to-people exchanges, underscoring the comprehensive impact of connectivity.

2.5 Inner Mongolia in the Context of China’s Borderland Development

In China’s development strategy, borderland regions have been reconceptualized as “frontiers of opening-up,” where geography is transformed from a constraint into an advantage [27]. Inner Mongolia exemplifies this reconfiguration, given its 4,200 kilometers of border with Russia and Mongolia and its role as a key node in the China–Mongolia–Russia Economic Corridor [28]. Recent studies emphasize that Inner Mongolia functions not only as a transit zone but

as a platform for industrial processing, cross-border logistics, and cultural exchange [29]. By situating itself within the dual circulation strategy, Inner Mongolia integrates national objectives of security and modernization with regional imperatives of trade and cooperation. This dual role underscores the analytical value of studying Inner Mongolia as a laboratory for borderland development, where local transformations reflect broader trends in China's integration into the global economy [30].

III. Methodology

3.1 Research Design

The research is exploratory and comparative in nature. Instead of testing a narrow hypothesis, it seeks to build a comprehensive understanding by:

- Examining the interplay between cross-border trade, industrial integration, and regional connectivity.
- Situating these findings within broader theoretical frameworks of political economy, regional integration, and borderland development.

To achieve this, the study synthesizes evidence from three primary sources: policy analysis, statistical data, and case studies.

3.2 Data Sources

This study utilizes a multi-faceted approach to data collection, drawing from the following key sources:

- Official Policy Documents: Including national and regional development plans, white papers, and official government statements to understand strategic frameworks and policy directives.
- Government Reports: Particularly annual work reports and development summaries from Inner Mongolia's local government, providing insights into implementation progress and regional priorities.
- Online Statistical Databases: Sourced from the National Bureau of Statistics, Inner Mongolia's Statistical Yearbooks, and international repositories (e.g., UN Comtrade, World Bank) for quantitative data on trade, economic output, and industrial growth.
- Related Academic Studies and Literature: Existing scholarly research is used to establish the theoretical foundation, provide context, and enable comparative analysis.

3.3 Analytical Framework

The analytical framework combines comparative regional analysis with a case-based approach. Comparative analysis situates Inner Mongolia alongside other Chinese borderland regions such as Xinjiang and Yunnan to assess similarities and divergences in their integration into the Belt and Road Initiative and dual circulation strategy. This allows for identifying how geography, resources, and institutional arrangements condition regional pathways of development. The case-based approach, on the other hand, provides in-depth examinations of specific trade corridors, industrial clusters, and connectivity platforms in Inner Mongolia.

3.4 Limitations

This study acknowledges several inherent limitations, including the potential for bias and selective representation within its primary sources of official government reports and trade statistics. Its findings are further bounded by a temporal scope that concludes in 2025, beyond which subsequent geopolitical and economic shifts are not captured. While the included case studies offer valuable depth, their specific nature may not be fully representative of the entire spectrum of economic activity across Inner Mongolia's diverse border regions. Finally, the qualitative and interpretive orientation of the research prioritizes rich contextual explanation over broad statistical generalizability. Notwithstanding these constraints, the study provides a foundational analysis and valuable insights, while also highlighting productive avenues for future research involving longitudinal data, expanded fieldwork, and interdisciplinary approaches.

IV. Inner Mongolia and Cross-Border Trade

4.1 Geostrategic Position and Border Advantages

Inner Mongolia's extensive 4,200-km land boundary with Mongolia and Russia, combined with its diagonal span across Northeast, North, and Northwest China, endows the region with significant leverage over China's northern trade arteries. This strategic geography situates Inner Mongolia at the confluence of the China–Mongolia–Russia Economic Corridor and the east/middle corridors of the China–Europe Railway Express (CERE), facilitating efficient routing of goods through Manzhouli in the east and Erenhot in the middle corridor to reach Eurasian markets. (Figure 2) As of the end of 2024, Inner Mongolia established trade links with 158 countries and achieved growth with 120 partners, demonstrating that its border advantages translate into diversified external economic ties [31].

Recent operational metrics further reinforce Inner Mongolia's geostrategic significance: Manzhouli recorded 2,327 CERE train trips in the first half of 2024 and substantial trade value associated with the Belt and Road Initiative (BRI), solidifying its role as China's largest land port [32]. Simultaneously, Erenhot expanded to over 70 overseas stations via more than 70 routes, enhancing its function as a critical middle-corridor gateway [37]. Beyond rail transport, Inner Mongolia is piloting large-scale logistics innovations. The Ganqimaodu port's 6.19-km cross-border Automated Guided Vehicle (AGV) corridor—China's first of its kind—reduces clearance times and stabilizes bulk flows, particularly for

coal [33]. Additionally, the rapid adoption of TIR (Transports Internationaux Routiers) door-to-door trucking has introduced a fourth logistics option for Eurasian trade, complementing existing air, rail, and sea modalities [36].

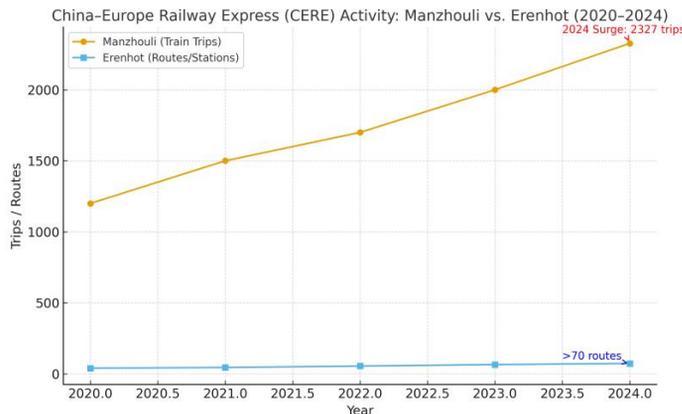


Figure 2, China–Europe Railway Express (CERE) Activity Chart (2020–2024)

4.2 Trade with Mongolia and Russia

Trade with Mongolia and Russia forms the backbone of Inner Mongolia’s border commerce. In 2023, trade with Mongolia reached 69.9 billion yuan, making it Inner Mongolia’s largest trading partner, while trade with Russia amounted to 34.66 billion yuan. Exports to Mongolia and Russia comprise a diverse commodity mix, including machinery, high-tech products, and consumer goods, while imports from these neighbors focus on energy, minerals, timber, and fertilizers. Manzhouli serves as Inner Mongolia’s primary rail link to Russia, handling the majority of east-bound flows that connect onward to Europe via the eastern China–Europe Railway Express corridor. Meanwhile, Erenhot, situated on the Trans-Mongolian Railway, anchors middle-corridor traffic toward Ulaanbaatar and the Trans-Siberian Railway, playing a critical role in freight movement to and from Mongolia. Real-time logistics indicators reveal rising throughput and diversification: Manzhouli’s CERE activity surged in mid-2024 [32], while Erenhot’s route map expanded to 73 lines serving over 70 stations in more than 10 countries [37]. Concurrently, firm-level trade data suggest a gradual broadening of the partner structure and product scope. Reports from the Observatory of Economic Complexity indicate a more than 5% expansion in exports between May 2024 and May 2025, with steady gains in electromechanical and agro-processed goods, implying incremental upgrading within regional value chains [40].

4.3 Institutional Arrangements

Inner Mongolia’s cross-border performance increasingly relies on institutions that compress transaction costs and enhance “soft connectivity.” Comprehensive bonded zones (CBZs)—customs-supervised areas with bonded warehousing, “entry-refund” tax treatment, and streamlined clearance—now serve as local engines for trade and processing, consistent with national policy design for over 160 CBZs [35]. Institutional innovation is evident in Hohhot CBZ’s “intra-zone direct transfer” service, which enables account-book reduction and customs completion without physical transfers—first piloted in April 2024 on imported alfalfa—thereby reducing handling time and inventory costs [34]. The “zone–port linkage” extends these efficiencies outward, aligning inland CBZ operations with seaports and railports to accelerate throughput and improve working capital turnover [34]. At the border, Manzhouli’s evolution from a “transit station” to a processing hub for grain, oil, and timber exemplifies institutional thickening, where bonded policies, inspection reforms, and park-level services anchor local value addition rather than mere transit [38]. Complementary measures include 24/7 appointment customs, integrated inspection yards, and smart-port systems (BeiDou/5G/IoT) that expedite checks and enable risk-based regulation, while TIR expansion reduces documentation and border friction for long-haul cross-border trucking [36].

4.4 Opportunities in Expanding Trade

Three opportunity vectors stand out. First, throughput expansion and network effects: the density of CERE services via Manzhouli and Erenhot lowers marginal logistics costs and increases schedule reliability, attracting higher-value, time-sensitive cargoes (e.g., machinery, electronics), especially as route counts and frequencies increase [32], [37]. Second, value-added processing near the border: Manzhouli’s industrial hub strategy and Hohhot CBZ’s maturing functions support import-side processing of timber, potash, and grain, as well as export-side finishing of agro-foods and light manufacturing, creating backward and forward linkages into domestic supply chains [38], [39]. (Figure 3) Third, modal and procedural innovation: the Ganqimaodu AGV corridor and wider adoption of TIR unlock faster, safer, and more predictable door-to-door movements, especially for bulk and overland corridors in energy and materials, while also serving new shippers that require trucking flexibility [33], [36]. Collectively, these gains align with dual-circulation priorities—importing critical inputs efficiently and exporting higher-value goods more competitively—while deepening Inner Mongolia’s role as a logistics-industrial pivot.



Figure 3, Goods to be delivered at Manzhouli (<https://www.yidaiyilu.gov.cn/p/0QPRGADI.html>)

4.5 Challenges and Risk Mitigation

Expanding trade also exposes structural constraints. Commodity dependence on coal, metals, and timber creates vulnerability to price cycles, while diversification into electromechanical and agrifood value-added remains gradual [40]. Capacity and seasonality bottlenecks at cold-climate border crossings can generate queues unless offset by digital pre-clearance, extended hours, and redundant yards; while reforms exist, consistent cross-border adoption is uneven [32], [37]. Regulatory heterogeneity, including varying standards, sanitary and phytosanitary (SPS) measures, and customs risk parameters, continues to raise coordination costs; while CBZ rules and zone–port linkages assist, they require steady scaling and inter-agency interoperability [35]. Geopolitical tensions and sanctions complicate logistics insurance, settlement, and compliance for Russia-related trade, amplifying the value of TIR guarantees and bonded-regime flexibility [36]. Finally, the localization of value-added remains a work in progress: while Manzhouli’s processing parks and Hohhot CBZ projects mark important steps, sustained clustering, skilled labor attraction, and financing for small and medium-sized enterprise (SME) exporters are essential for achieving further upgrading [38], [39].

V. Industrial Integration in Inner Mongolia

5.1 Industrial Structure and Economic Base of Inner Mongolia.

In 2024, Inner Mongolia’s regional gross domestic product (GDP) reached 2.63 trillion yuan, marking a year-on-year increase of 5.8%. The primary industry recorded an added value of 287.26 billion yuan, up by 5.6%; the secondary industry grew by 7.0% to 1.16 trillion yuan; while the tertiary industry expanded by 4.9%, reaching 1.18 trillion yuan. The ratio of the three sectors was 10.9 : 44.1 : 45.0, reflecting a balanced economic structure. In terms of contribution to GDP growth, the primary industry accounted for 10.7%, the secondary industry contributed 47.4%, and the tertiary industry made up 41.9%. Traditional industries such as coal, metallurgy, and chemicals continue to dominate the industrial landscape, underpinned by Inner Mongolia’s abundant deposits of coal, rare earths, and non-ferrous metals [41]. At the same time, emerging sectors such as equipment manufacturing, renewable energy, and digital services are gaining ground, supported by national policies to diversify the regional economy and integrate it into broader supply chains. Industrial concentration is visible in Ordos for coal-to-chemicals, Baotou for rare earth processing, and Hohhot for dairy and agricultural products. This evolving industrial profile provides the economic base for integration with cross-border markets and the Belt and Road Initiative (BRI).

5.2 Resource-Based Industries and Downstream Integration.

Resource-based industries remain the backbone of Inner Mongolia’s economic structure, but their integration into downstream processing sectors has accelerated in recent years. The coal sector has shifted from raw extraction toward coal-to-liquids, coal-to-gas, and advanced chemical materials, creating deeper domestic and export-oriented value chains [42]. Baotou’s rare earth industry has moved beyond primary separation into high-value applications such as permanent magnets, alloys, and renewable energy components. Agricultural integration has also progressed, with grain and oil processing, meatpacking, and dairy product industrialization turning local production into branded commodities for national and international markets. These downstream linkages are designed to mitigate the risks of “resource curse” dependence by embedding resources into diversified industrial chains, enhancing resilience and competitiveness in both domestic and foreign markets.

5.3 Cross-Border Industrial Clusters and Value Chain Linkages.

Cross-border industrial integration is most visible in the creation of clusters around port cities such as Manzhouli and Erenhot, where processing parks combine bonded warehousing, logistics, and industrial upgrading functions. In Manzhouli, wood processing, fertilizer blending, and grain crushing industries are expanding to capture value from Russian and Mongolian imports, transforming what was once a transit hub into a localized industrial ecosystem [43]. Similar clustering is evident in Erenhot, where “border trade + processing” models convert imported oilseeds, wool, and minerals into semi-finished and finished products for domestic use and re-export. These clusters illustrate how Inner Mongolia is moving from “passing-through” economies toward “landing economies,” embedding foreign inputs into domestic value chains while feeding processed products into global networks. Such developments align with China’s dual circulation strategy, which encourages frontier regions to act simultaneously as absorbers of international resources and suppliers of processed outputs.

5.4 Case Studies: Energy, Agriculture, and Manufacturing Integration.

Case evidence highlights how sectoral integration is reshaping Inner Mongolia’s industrial base. In energy, Ordos has become a testing ground for clean coal technologies and renewable energy hybrids, with vast wind and solar projects linked to new energy storage systems that integrate into both national and cross-border power grids [44] (figure 4) . In agriculture, the dairy industry like Yili and Mengniu demonstrates how local livestock resources are combined with advanced processing, branding, and global distribution, allowing Inner Mongolia to export dairy products to Asia and beyond. Manufacturing integration is evident in Baotou’s rare earth-based equipment clusters and Hohhot’s automotive assembly, which benefit from logistics corridors linking the region to Russia, Mongolia, and European markets.



Figure 4, Ordos solar projects (<https://regional.chinadaily.com.cn/ordosen/en/ordosmodernenergyeconomydevelopment.html>)

5.5 Barriers to Industrial Integration (Environmental, Policy, Market).

Despite progress, several barriers constrain Inner Mongolia’s industrial integration. Environmental constraints are particularly acute: coal-heavy industries and desertification pressures create ecological vulnerabilities that complicate sustainable growth, requiring stricter environmental governance and green technology adoption [45]. Policy fragmentation is another barrier, as inconsistencies between national, provincial, and local regulations can slow the scaling of cross-border industrial zones and bonded-area projects. Market-related challenges also persist, including overreliance on volatile commodity prices, insufficient brand recognition for processed products, and financing gaps for small and medium-sized enterprises. Moreover, geopolitical uncertainties and sanctions affecting Russia can indirectly disrupt supply chains and trade settlement systems. Addressing these barriers requires not only technological upgrading and policy harmonization but also deeper integration with domestic markets in Beijing–Tianjin–Hebei, the Yangtze River Delta, and the Pearl River Delta, ensuring that Inner Mongolia’s industrial integration is both outward- and inward-oriented.

VI. Regional Connectivity and Infrastructure Development

6.1 Transport Corridors: Rail, Road, and Air Connectivity.

The development of transport corridors has been a cornerstone of Inner Mongolia’s role in enhancing regional connectivity. The region serves as a critical hub for the China–Europe Railway Express, with the Manzhouli and Erenhot rail ports handling more than 40% of China’s outbound and inbound trains by 2024. Routes from these gateways now extend to over 70 cities in 10 European and Eurasian countries, providing efficient east–west freight

alternatives to maritime shipping [46]. Road connectivity has also expanded, with the full operation of the Ganqimaodu Highway and cross-border truck corridors, including TIR-based systems, facilitating faster cargo movement to Mongolia and Russia. Air connectivity is advancing as well: the launch of freight routes from Hohhot and Ordos to Central Asia and Europe has diversified logistical channels, complementing land corridors.



Figure 5: The first "BX70B" type of the scheduled China-Europe freight train departs from Hohhot. (<https://www.yidaiyilu.gov.cn/p/0G1P6V3D.html>)

6.2 Energy Infrastructure: Pipelines and Power Grids.

Inner Mongolia coal and renewable energy industries provide power to eastern and northern Chinese provinces, while cross-border pipelines and electricity grids strengthen energy integration with Russia and Mongolia. The China–Russia crude oil and natural gas pipelines that traverse Inner Mongolia represent strategic supply routes, reducing reliance on maritime chokepoints and enhancing China’s energy security [47]. Additionally, grid interconnections are being piloted to allow surplus wind and solar energy from Inner Mongolia to be exported regionally, with projects like the West–East Power Transmission expanding scale and capacity. As renewable energy output grows, cooperation with Mongolia on cross-border wind and solar projects is deepening, transforming Inner Mongolia into a hub for green energy exports and a laboratory for regional energy transition initiatives.

6.3 Digital Connectivity and E-Commerce in Border Trade.

Digital connectivity has emerged as an equally critical dimension of infrastructure development in Inner Mongolia. Cross-border e-commerce zones in Erenhot, Hohhot, and Manzhouli have expanded rapidly, integrating digital platforms with customs clearance systems to facilitate small-scale trade flows. By 2024, Inner Mongolia’s e-commerce trade exceeded 100 billion yuan, with significant shares attributed to border transactions [48]. Big data, blockchain, and smart logistics platforms are increasingly used to enhance efficiency, transparency, and trust in trade processes, reducing clearance times and transaction costs. Initiatives such as bonded e-commerce warehouses and “digital Silk Road” projects are connecting Inner Mongolian enterprises to global supply chains, particularly in consumer goods, agricultural products, and intermediate inputs.

6.4 Role in the Belt and Road Initiative and Eurasian Land Bridge.

Inner Mongolia’s transport and infrastructural systems serve as a linchpin in the Belt and Road Initiative (BRI), particularly through its contribution to the Eurasian Land Bridge. As a major passageway for the eastern and middle corridors of the China–Europe freight network, the region provides logistical resilience by diversifying trade routes and reducing dependency on maritime shipping [49]. Its infrastructural role extends beyond physical trade: Inner Mongolia’s bonded zones, economic cooperation parks, and cross-border logistics hubs embody the BRI’s principle of “policy coordination, infrastructure connectivity, unimpeded trade, financial integration, and people-to-people ties.” Furthermore, the region’s integration into BRI cooperation forums and trilateral platforms with Russia and Mongolia illustrates how frontier provinces can advance national foreign policy through infrastructural development and trade facilitation.

6.5 Cross-Border Cooperation Mechanisms.

Institutional mechanisms are crucial to sustaining the connectivity enabled by infrastructure. Inner Mongolia has established multiple bilateral and multilateral platforms with Russia and Mongolia, including the China–Mongolia–Russia Economic Corridor and localized “3+3” cooperation forums linking prefectures across borders. Free trade pilot zones, bonded logistics centers, and border economic cooperation areas institutionalize economic collaboration and support industrial clustering around transport nodes [50]. Customs reforms such as 24-hour clearance, “green channels”

for perishables, and digitalized documentation systems have reduced bottlenecks and transaction costs. Meanwhile, cooperation in environmental management, tourism, and people-to-people exchanges ensures that connectivity extends beyond material flows. These mechanisms highlight how infrastructure must be complemented by governance frameworks, ensuring that connectivity is both efficient and sustainable. By combining physical, digital, and institutional integration, Inner Mongolia is strengthening its position as China's northern gateway and as a central node in Eurasian connectivity.



Figure 6: On August 26, 2025, the China (Inner Mongolia) - Russia Investment and Trade Cooperation Promotion Conference was held in Hohhot, Inner Mongolia. (<https://www.yidaiyilu.gov.cn/p/0HO0208G.html>)

VII. Inner Mongolia's Role in the Dual Circulation Strategy

7.1 Contribution to Domestic Circulation (Internal Markets, Industrial Supply Chains).

Inner Mongolia plays a critical role in strengthening China's domestic circulation by providing energy, raw materials, and agricultural products that underpin the stability of national supply chains. As the country's leading producer of coal, rare earths, and non-ferrous metals, the region ensures a steady flow of strategic resources to downstream industries in Beijing, Tianjin, Hebei, and the Yangtze River Delta. Its robust livestock, dairy, and grain production also enhances China's food security while supporting domestic consumer markets. Furthermore, Inner Mongolia's expanding industrial base anchors regional value chains and supplies intermediate goods to other provinces. These linkages help reduce dependence on imports, foster import substitution in strategic sectors, and support the central government's emphasis on building self-reliant supply networks in an era of global uncertainty.

7.2 Contribution to International Circulation

At the same time, Inner Mongolia is indispensable for China's international circulation, serving as the country's primary land bridge to Russia, Mongolia, and Europe. Border trade through Manzhouli, Erenhot, and Ganqimaodu connects Chinese industries with Eurasian markets, while the China-Europe Railway Express consolidates the region's role as a continental logistics hub. The export of "new three" products—electric vehicles, lithium batteries, and solar panels—via Inner Mongolian corridors demonstrates how the region links domestic industrial upgrading to international demand. Moreover, the expansion of bonded zones, cross-border e-commerce platforms, and customs modernization has facilitated the integration of Inner Mongolia into global supply chains. This outward-facing role not only enhances China's export capacity but also diversifies trade routes, mitigating risks associated with maritime bottlenecks and geopolitical tensions.

7.3 Interaction of Domestic and International Circulation in Inner Mongolia.

The unique significance of Inner Mongolia lies in its ability to harmonize internal and external circulations. The region transforms imported resources such as crude oil, copper, and timber into processed products through its growing industrial clusters, which are then redistributed to domestic markets or exported abroad. This "inward processing-outward circulation" model exemplifies the embedded openness envisioned in the dual circulation framework. For example, coal imported from Mongolia is upgraded through local chemical industries before being integrated into national energy networks or exported as higher-value-added products. Likewise, agricultural imports such as oilseeds undergo local processing to supply both Chinese cities and international markets. Through these dynamics, Inner Mongolia acts as both a receiver and a redistributor, linking external inflows to domestic upgrading and externalizing domestic production capacity to global markets.

7.4 Strategic Importance for National Security and Economic Resilience.

Beyond its economic functions, Inner Mongolia's role in the dual circulation strategy also carries profound implications for national security and resilience. Its vast resource reserves—coal, rare earths, and renewable energy potential—form the backbone of China's energy and industrial security, reducing vulnerability to external supply shocks. Its border connectivity with Russia and Mongolia provides alternative trade routes and buffers against maritime risks, while its ecological systems serve as a northern shield for environmental stability. The strengthening of cross-border cooperation and infrastructure further ensures that Inner Mongolia remains a secure gateway for international circulation while maintaining robust ties with domestic markets. In this sense, the region exemplifies the dual role of frontier provinces: they not only contribute to economic growth but also safeguard the resilience of the entire nation's circulation system in times of global volatility.

VIII. Policy Implications and Recommendations

8.1 Enhancing Institutional Support for Cross-Border Trade.

To maximize Inner Mongolia's role as China's northern gateway, institutional frameworks governing trade facilitation must be further strengthened. This includes expanding the coverage and efficiency of free trade zones, bonded logistics centers, and border economic cooperation zones to reduce transaction costs and harmonize cross-border procedures. Customs modernization—through digital platforms, big data analytics, and AI-driven clearance systems—should be accelerated to ensure “smart borders” capable of handling rising trade volumes. In addition, promoting standardized rules of origin, inspection, and quarantine agreements with Mongolia and Russia reduces bottlenecks and aligns Inner Mongolia more closely with international trade governance norms. These measures ensure that the region's border advantages translate into sustainable trade flows.

8.2 Strengthening Industrial Upgrading and Green Transformation.

Industrial integration in Inner Mongolia must shift from resource dependence toward value-added processing and green innovation. Policies should encourage the development of downstream industries in coal-chemical, rare earths, and renewable energy sectors, ensuring that raw resource exports are replaced with higher-value goods and technologies. Incentives for clean technologies, circular economy practices, and carbon-reduction initiatives keep industrial development consistent with China's “dual carbon” goals. In addition, targeted support for innovation clusters in energy storage, new materials, and agricultural processing enhances Inner Mongolia's role in both domestic upgrading and international supply chains. A transition toward greener and smarter industries not only improves competitiveness but also reduces ecological pressures in this environmentally fragile region.

8.3 Improving Transport, Energy, and Digital Infrastructure.

Priority should be given to expanding cross-border rail capacity at Manzhouli and Erenhot, modernizing highways linked to Ganqimaodu and Ceke, and upgrading regional airports into international freight hubs. Energy infrastructure—including transboundary pipelines, power grid interconnections, and renewable energy transmission corridors—requires further expansion to support China's energy security and export potential. Equally important is the development of digital infrastructure: enhanced broadband coverage, cross-border e-commerce platforms, and digital customs clearance systems create a parallel “digital Silk Road.” Together, these investments strengthen multi-modal integration and ensure that Inner Mongolia's geographic advantages are effectively leveraged.

8.4 Building Synergies Between Local Development and National Strategy.

Policy design must ensure that Inner Mongolia's regional priorities align with broader national development frameworks. This requires tighter coordination among local governments, central ministries, and state-owned enterprises to integrate the region into China's industrial transfer and supply chain restructuring plans. Mechanisms such as fiscal incentives, targeted subsidies, and regional development funds channel investment into strategic sectors and avoid duplication of projects. In addition, the integration of Inner Mongolia's development with the strategies of Beijing-Tianjin-Hebei, the Yangtze River Delta, and the Guangdong-Hong Kong-Macao Greater Bay Area enhances interregional complementarities. Positioning Inner Mongolia as both a contributor to national security (energy, food, ecological) and as a hub for international circulation creates synergies that reinforce the dual circulation model.

8.5 Fostering Regional Cooperation with Mongolia, Russia, and Beyond.

Inner Mongolia's future prosperity depends on deeper cooperation with neighboring countries and expanded participation in multilateral frameworks. Strengthening the China–Mongolia–Russia Economic Corridor requires not only infrastructure development but also institutionalized trilateral mechanisms for trade facilitation, energy cooperation, and environmental governance. Building “cross-border industrial clusters” with Mongolia and Russia integrates value chains in mining, agriculture, and renewable energy. Furthermore, diversifying partnerships beyond immediate neighbors to include Central Asia, Europe, and Northeast Asia mitigates risks of overdependence and expands market opportunities.

IX. Conclusion

This study demonstrated that Inner Mongolia's geostrategic location at the heart of the China–Mongolia–Russia Economic Corridor, combined with its abundant natural resources and expanding infrastructure, positions it as both a

driver of domestic circulation and a gateway for international engagement. Its role illustrates the principle of embedded openness, where internal upgrading in supply chains, industry, and markets is reinforced through external linkages with neighboring and global partners. The findings reveal three key dimensions of progress. First, in trade facilitation, Inner Mongolia's land ports, bonded zones, and multimodal transport corridors have anchored the region in global value chains and enhanced its role as a logistics hub. Second, industrial integration is advancing through downstream processing in energy, agriculture, and rare earth industries, alongside emerging investments in renewable energy and e-commerce. Third, infrastructural expansion in transport, power grids, and digital networks has laid the groundwork for multi-scalar connectivity, reinforcing Inner Mongolia's dual role as a national security frontier and a transnational corridor.

Despite these achievements, important challenges remain. Heavy reliance on resource-based industries, ecological vulnerabilities, and external uncertainties continue to shape the region's development trajectory. Addressing these issues requires sustained efforts in green transformation, institutional coordination, and diversified partnerships with Mongolia, Russia, and broader Eurasian economies. Ultimately, Inner Mongolia exemplifies how China's border regions can serve as strategic laboratories for integrating domestic resilience with global engagement, reinforcing the country's pursuit of a balanced and sustainable dual circulation model.

Acknowledgement: This study is a phased achievement of the 2025 commissioned project "Building an Open Inner Mongolia" (Grant No. 2025NDE063) under the Inner Mongolia Autonomous Region Philosophy and Social Sciences Planning Program.

References

- [1] National Development and Reform Commission, *Vision and Actions on Jointly Building Silk Road Economic Belt and 21st-Century Maritime Silk Road*, Beijing: NDRC, 2015.
- [2] World Bank, *Belt and Road Economics: Opportunities and Risks of Transport Corridors*, Washington, DC: World Bank, 2019. doi: 10.1596/978-1-4648-1392-4
- [3] China Daily, "BRI tightly integrates domestic, international circulations," *China Daily*, Apr. 25, 2023. [Online]. Available: <https://www.chinadaily.com.cn>
- [4] Xinhua News Agency, "China-Europe Railway Express trains exceed 110,000 trips," *Xinhua*, Sept. 2024. [Online]. Available: <http://www.xinhuanet.com>
- [5] Inner Mongolia Bureau of Statistics, *Inner Mongolia Statistical Yearbook 2024*, Beijing: China Statistics Press, 2025.
- [6] Y. Zhang, "China's Dual Circulation Strategy: Domestic Drivers and Global Implications," *China Quarterly of International Strategic Studies*, vol. 7, no. 1, pp. 1–18, 2021. doi: 10.1142/S2377740021500012
- [7] A. Garnaut, "China's dual circulation strategy and the global economy," *East Asian Economic Review*, vol. 25, no. 4, pp. 349–370, 2021. doi: 10.11644/KIEP.EAER.2021.25.4.386
- [8] E. B. Haas, *The Uniting of Europe: Political, Social, and Economic Forces, 1950–1957*. Stanford, CA: Stanford Univ. Press, 1958.
- [9] P. Dicken, *Global Shift: Mapping the Changing Contours of the World Economy*, 7th ed. New York: Guilford Press, 2015.
- [10] S. Sassen, *Territory, Authority, Rights: From Medieval to Global Assemblages*. Princeton, NJ: Princeton Univ. Press, 2006.
- [11] J. Yeung, "China's dual circulation strategy: A new paradigm for economic development," *China Economic Journal*, vol. 14, no. 3, pp. 287–303, 2021.
- [12] A. Garnaut, "China's dual circulation strategy and the global economy," *East Asian Economic Review*, vol. 25, no. 4, pp. 349–370, 2021.
- [13] Y. Zhang, "China's dual circulation: Embedded openness in the new era," *Journal of Contemporary China*, vol. 31, no. 134, pp. 567–583, 2022.
- [14] National Development and Reform Commission, *Outline of the 14th Five-Year Plan for Economic and Social Development of China*, Beijing: NDRC, 2021.
- [15] R. Baldwin, *The Great Convergence: Information Technology and the New Globalization*. Cambridge, MA: Harvard Univ. Press, 2016.
- [16] J. Anderson and J. O'Dowd, "Borders, border regions and territoriality: Contradictory meanings, changing significance," *Regional Studies*, vol. 33, no. 7, pp. 593–604, 1999.
- [17] P. Cai, "Understanding China's Belt and Road Initiative," *Lowy Institute for International Policy*, 2017.
- [18] H. Liu and L. Song, "Economic cooperation zones and border development in China: Evidence from Yunnan and Xinjiang," *Journal of Borderlands Studies*, vol. 36, no. 1, pp. 1–18, 2021.
- [19] G. Gereffi, "Global value chains in a post-Washington Consensus world," *Review of International Political Economy*, vol. 21, no. 1, pp. 9–37, 2014.
- [20] J. Zeng and S. Fang, "China's industrial upgrading under the Belt and Road Initiative," *Asia Europe Journal*, vol.

19, no. 2, pp. 223–239, 2021.

- [21] Inner Mongolia Development Research Center, Report on Industrial Integration in Inner Mongolia, Hohhot: IMDRC Press, 2023.
- [22] OECD, Global Value Chains and Trade Policy: Policy Implications of Value Chain Participation, Paris: OECD Publishing, 2020.
- [23] World Bank, Belt and Road Economics: Opportunities and Risks of Transport Corridors, Washington, DC: World Bank, 2019.
- [24] D. Dollar, “Infrastructure and regional connectivity: Lessons from Asia,” Brookings Institution, 2020.
- [25] X. Li and H. Sun, “The role of Inner Mongolia in the China–Mongolia–Russia economic corridor,” *Eurasian Geography and Economics*, vol. 62, no. 6, pp. 681–700, 2021.
- [26] S. Sassen, *Territory, Authority, Rights: From Medieval to Global Assemblages*. Princeton, NJ: Princeton Univ. Press, 2006.
- [27] T. He, “Borderlands and China’s new opening-up strategy,” *Journal of Contemporary Asia*, vol. 50, no. 3, pp. 422–439, 2020.
- [28] Y. Wu, “Geopolitics of the China–Mongolia–Russia Economic Corridor,” *China Quarterly of International Strategic Studies*, vol. 7, no. 2, pp. 155–176, 2021.
- [29] L. Hao and F. Lu, “Cross-border trade and industrial development in Inner Mongolia,” *Asian Journal of Comparative Politics*, vol. 7, no. 4, pp. 445–461, 2022.
- [30] H. Gao, “Borderlands as laboratories: Rethinking China’s peripheries,” *Modern China*, vol. 49, no. 1, pp. 25–52, 2023.
- [31] “Inner Mongolia sees import and export growth with 120 trade partners,” *China Daily* (govt portal), Jan. 23, 2025. [Online]. Available: <https://govt.chinadaily.com.cn>. [Accessed: Sep. 5, 2025].
- [32] “Manzhouli railway port handles 2,327 China-Europe freight train trips in H1,” State Council – english.gov.cn, Jul. 23, 2024. [Online]. Available: <https://english.www.gov.cn>. [Accessed: Sep. 2, 2025].
- [33] “China’s first cross-border unmanned transport channel fully operational at Ganqimaodu,” *China Daily* (Inner Mongolia), Jun. 24, 2024. [Online]. Available: <https://regional.chinadaily.com.cn>. [Accessed: Sep.25, 2025].
- [34] “First ‘intra-zone direct transfer’ implemented in Hohhot CBZ,” *China Services Info*, Apr. 19, 2024. [Online]. Available: <https://chinaservicesinfo.com>. [Accessed: Sep. 1, 2025].
- [35] “Comprehensive bonded zones fuel China’s foreign trade,” *CIIE News*, Apr. 18, 2025. [Online]. Available: <https://ciie.org>. [Accessed: Sep. 4, 2025].
- [36] “Door-to-door delivery with TIR from China: what’s possible?” *IRU Newsroom*, Jun. 5, 2025. [Online]. Available: <https://iru.org>. [Accessed: Sep. 2, 2025].
- [37] “China–Mongolia border port handles milestone 20,000th CERE train; Erenhot now serves 73 routes,” State Council – english.gov.cn, Aug. 3, 2025. [Online]. Available: <https://english.www.gov.cn>. [Accessed: Sep. 4, 2025].
- [38] “Largest China-Russia land port reinvents itself as industrial hub,” *Belt and Road Portal* (Xinhua), May 15, 2025. [Online]. Available: <https://eng.yidaiyilu.gov.cn>. [Accessed: Sep. 2, 2025].
- [39] “Hohhot CBZ sees foreign trade surge and new projects,” *China Daily* (Hohhot), Jun. 3, 2024. [Online]. Available: <https://regional.chinadaily.com.cn>. [Accessed: Sep. 1, 2025].
- [40] “Inner Mongolia Autonomous Region (CHN) – Exports,” *OEC* (Observatory of Economic Complexity), accessed Sep. 2, 2025. [Online]. Available: <https://oec.world>.
- [41] National Bureau of Statistics of China, “Statistical Communiqué of Inner Mongolia on the 2024 Regional Economy,” Beijing, 2025.
- [42] D. Andrews-Speed and X. Ma, *China’s Energy Transition: The Case of Inner Mongolia*, Oxford Institute for Energy Studies, 2023.
- [43] Xinhua News Agency, “Manzhouli Reinvents Itself as an Industrial Hub,” *Belt and Road Portal*, May 15, 2025.
- [44] International Energy Agency (IEA), “China’s Provincial Energy Transitions: Inner Mongolia Case Study,” Paris: IEA, 2024.
- [45] Y. Wang, “Environmental Challenges of Resource-Dependent Regions: Evidence from Inner Mongolia,” *Journal of Cleaner Production*, vol. 425, p. 138642, 2024.
- [46] Xinhua News Agency, “China-Europe Railway Express through Inner Mongolia surpasses new record,” *China Daily*, May 2024.
- [47] International Energy Agency (IEA), “China’s Energy Infrastructure and Cross-Border Pipelines,” Paris: IEA, 2023.
- [48] Ministry of Commerce of China, “Report on Cross-Border E-Commerce Development in Inner Mongolia,” Beijing, 2024.
- [49] Y. Liu and H. Zhang, “Eurasian Land Bridge and Inner Mongolia’s Role in the Belt and Road Initiative,” *Journal of Contemporary China*, vol. 33, no. 142, pp. 267–283, 2024.
- [50] Inner Mongolia Development Research Center, “Regional Cooperation and Institutional Innovation in Border Trade,” Hohhot: IMDRC Report, 2025.