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Department of Sociology, Economic
Theory and International Processes
38.04.01 Economics
International Economics and Business

GRADUATION THESIS

on

Russia-China border trade in the contemporary context

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ASSIGNMENT
FOR THE GRADUATION THESIS OF

Master's degree student Gong Jinrong, group 24ЭЭВам1, full-time mode of study

1 The topic of the graduation thesis: "Russia-China border trade in the contemporary context"

was approved by the university order
dated « ____ » _____ 20 ____ no. _____

2 The deadline for the Master's degree student to complete the graduation thesis is 15.06.2026.

3 The input data for the graduation thesis is the regulatory and legal framework, scientific literature and reference books, and Internet data.

4 The list of issues to be studied includes evolution of China-Russia border trade; current characteristics and core status of China-Russia border trade transformation in the modern economy; trade volume, structure and regional distribution of China-Russia border trade in the transformation process; driving forces, constraints and existing problems of border trade transformation; practical paths for transformation and upgrading of border trade; future development trends and prospects of border trade transformation.

5 The list of visuals contains tables and figures.

6 The date of setting the assignment is 8.10.2024.

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Schedule for completing the graduation thesis

№ п/п	Content of the thesis	Deadline for completion	Due date, signature of the academic adviser
First year of study			
1	Substantiating of the research topic and methodology, subject and object of research	1.09.2024 – 31.10.2024	
2	Framing the scientific concept of research	1.11.2024 – 18.12.2024	
3	Collection of scientific literature for the thesis	19.12.2024 – 15.01.2025	
4	Substantiating the relevance, concept, and novelty of the research	16.01.2025 – 19.02.2025	
5	Framing of a detailed plan and layout of the research	20.02.2025 – 12.03.2025	
6	Studying new literature sources within the topic of the thesis	13.03.2025 – 26.03.2025	
7	Conducting theoretical research within the first chapter of the thesis	27.03.2025 – 30.04.2025	
8	Preparing the first chapter of the thesis	1.05.2025 – 30.06.2025	
Second year of study			
9	Conducting analytical research within the second chapter of the thesis	1.09.2025 – 22.10.2025	
10	Preparing the second chapter of the thesis	23.10.2025 – 24.12.2025	
11	Conducting analytical research within the third chapter of the thesis	25.12.2025 – 25.02.2026	
12	Preparing the third chapter of the thesis	26.02.2026 – 21.04.2026	
13	Preparing the introduction and conclusion	22.04.2026 – 12.05.2026	
14	Completing the graduation thesis	13.05.2026 – 27.05.2026	
15	Handing in the thesis for compliance control and antiplagiat	28.05.2026 – 11.06.2026	
16	Getting acquainted with the feedback and review	13.06.2026	
17	Presenting the written thesis	15.06.2026	

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Summary

The graduation thesis comprises 83 pages, 3 chapters, 24 figures, 68 sources.

CHINA, RUSSIA, BORDER TRADE, TRADE STRUCTURE, TRANSFORMATION

The object of this research is international bilateral economic relations.

The subject of this thesis is current state, problems and prospects of China and Russia border trade relation.

The research purpose is to study key determinants and contemporary trends of Russia-China border trade.

The methodological framework of the paper is formed by system approach, analysis and synthesis, statistical and comparative methods. To display identified economic dependencies graphical method was applied.

The results of research include: evolution of China-Russia border trade was studied; current characteristics and core status of China-Russia border trade transformation in the modern economy was revealed; trade volume, structure and regional distribution of China-Russia border trade in the transformation process were examined; driving forces, constraints and existing problems of border trade transformation were studied; practical paths for transformation and upgrading of border trade were identified; future development trends and prospects of border trade transformation were suggested.

The novelty of the paper is that the research reveals emerging trends and challenges in Russia-China economic relations, specifically within the transforming landscape of border trade.

The theoretical significance of work involves that the thesis provides foundational insights for future research on the evolving nature of bilateral trade and economic partnership in border regions.

The practical significance is that the results provide an evidence base for adjusting state policies, customs regulation, business strategies and regional development programmes in both Russia and China.

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Introduction

In the present stage of extensive progress in global economic integration and rapid changes in the contemporary economic system, border trade, as a particular kind of international commerce, is very important in advancing the regional economic growth, strengthening the bilateral economic and commercial relations, and enhancing the cultural exchange between nations. China and Russia, as significant strategic cooperative countries and adjacent nations with a vast border area, have a long history of border trade. In fact, since the establishment of diplomatic relations between China and Russia in 1992, especially with the continuous development of the Belt and Road project and the joining of the Eurasian Economic Union, the border trade between China and Russia has experienced a period of recovery, increase, acceleration and transformation, and has gradually become an essential part of Sino-Russian economic and commercial cooperation and a crucial connection for the economic development of the border areas of both countries.

The modern economy, featuring digitalization, greenization and diversification, has brought profound changes to the development of international trade, and also put forward new requirements and challenges for the transformation and upgrading of China-Russia border trade. In the past, China-Russia border trade was mainly dominated by primary products and labor-intensive products, with a relatively single trade structure, extensive development mode and low trade added value. To put it simply, this model can no longer adapt to the development trend of the modern economy and the strategic needs of Sino-Russian cooperation. Under the background of the modern economy, how to promote the transformation of China-Russia border trade from scale expansion to quality improvement, from traditional trade to digital and green trade, and from single commodity trade to diversified cooperation has become an urgent issue to be solved in the process of deepening Sino-Russian economic and trade cooperation.

At present, China-Russia border trade is in a critical period of high-quality transformation. On the one hand, the deepening of the comprehensive strategic cooperative partnership between China and Russia, the continuous improvement of cross-border infrastructure and the strong support of policies have provided favorable conditions for the transformation of border trade. On the other hand, the complex and volatile global

geopolitical pattern, the reconstruction of the international industrial chain and supply chain, and the unbalanced development of border regions have also brought many constraints and challenges to the transformation of border trade. Therefore, systematically exploring the evolution course, current characteristics, driving forces, constraints and practical paths of China-Russia border trade transformation in the context of the modern economy is not only of great theoretical significance for enriching the research on border trade and Sino-Russian economic and trade cooperation, but also of important practical guiding significance for promoting the high-quality development of China-Russia border trade, deepening the comprehensive strategic cooperative partnership between China and Russia, and boosting the economic development of border regions of both countries.

The object of this research is international bilateral economic relations.

The subject of this thesis is current state, problems and prospects of China and Russia border trade relation.

The research purpose is to study key determinants and contemporary trends of Russia-China border trade.

To achieve this goal, this study proposes the following research tasks:

- to trace how China-Russia border trade has evolved and to describe its current state, including trade volume, structure and regional distribution;
- to identify the main internal and external driving forces that push the transformation of border trade;
- to analyze the key constraints, bottlenecks and problems that slow down this transformation;
- to propose practical paths for transforming and upgrading border trade;
- to assess future development trends and give a forecast of border trade prospects.

The novelty of the paper is that the research reveals emerging trends and challenges in Russia-China economic relations, specifically within the transforming landscape of border trade.

The theoretical significance of work involves that the thesis provides foundational insights for future research on the evolving nature of bilateral trade and economic partnership in border regions.

The practical significance is that the results provide an evidence base for adjusting state policies, customs regulation, business strategies and regional development programmes in both Russia and China.

The work structure is determined by the purpose and tasks decided in the work.

Chapter 1 describes the past evolution and the present situation of border trade – how it has changed, its main features today, and key data on trade volume, structure and regional distribution. Chapter 2 explains what drives the transformation, what constraints and bottlenecks hold it back, and what main problems exist. Chapter 3 suggests practical ways to upgrade trade, proposes policy support and innovations, and discusses future trends and prospects.

Chapter 1 Current situation and evolution of China-Russia border trade in the modern economy

1.1 Evolution of China-Russia border trade

With the in-depth advancement of global economic integration and the profound adjustment of the international economic order, the modern economy has gradually formed the characteristics of informatization, globalization and diversification – these changes have actually brought earth-shaking impacts on the development pattern of international trade. As a special form of international trade, border trade, relying on the geographical proximity and cultural affinity between neighboring countries, has become an important link to promote bilateral economic and trade cooperation, optimize regional resource allocation and enhance regional economic vitality.

As major economies in the world and permanent members of the United Nations Security Council, China and Russia share a border line of more than 4,300 kilometers, which is a unique geographical advantage that cannot be replicated for the development of border trade between the two countries. In the current modern economic pattern, with the continuous deepening of the comprehensive strategic cooperative partnership between China and Russia, the in-depth docking of the Belt and Road initiative and the Eurasian Economic Union, and the continuous optimization of the policy environment for border trade, China-Russia border trade has experienced a profound transformation. To put it simply, it has developed from the initial simple commodity exchange to a diversified development model covering multiple fields, levels and modes, and has now become an important part of Sino-Russian economic and trade cooperation, as well as a key driving force for the economic development of border regions of both countries.

This chapter focuses on the current situation and evolution of China-Russia border trade in the modern economy. Specifically, it systematically sorts out the evolution process of China-Russia border trade under the background of the modern economic pattern, in-depth analyzes the current characteristics and core status of border trade transformation, and makes a detailed study on the trade volume, trade structure and regional distribution of

China-Russia border trade – all these efforts are to lay a solid empirical foundation for the subsequent study on the transformation of China-Russia border trade.

At the same time, combined with relevant statistical data and typical cases, this chapter uses appropriate charts to visualize the development status and evolution trend of China-Russia border trade, so as to further enhance the persuasiveness and scientificity of the research. It should be emphasized that the research content of this chapter is not only an important part of the whole thesis, but also provides a realistic basis for exploring the transformation path of China-Russia border trade in the modern economy and solving the existing problems in the development process.

The evolution of China-Russia border trade is closely linked to the changes of the domestic and foreign economic environment of both countries and the adjustment of bilateral relations, especially under the impact of the modern economic pattern, the evolution of China-Russia border trade has shown obvious phased characteristics. Since the establishment of diplomatic relations between China and Russia in 1992, with the continuous improvement of the modern economic system of both countries and the deepening of bilateral economic and trade cooperation, China-Russia border trade has gone through four distinct evolution stages [11]: the initial recovery stage (1992–2000), the steady growth stage (2001–2008), the accelerated development stage (2009–2018), and the high-quality transformation stage (2019 – present). Each stage has its unique historical background, development characteristics and main achievements, which together constitute the complete evolution process of China-Russia border trade under the modern economic pattern.

1 Initial Recovery Stage (1992–2000): exploration and restart under the Background of system transformation [2].

The period from 1992 to 2000 was the initial recovery stage of China-Russia border trade, which was closely related to the system transformation of both countries after the collapse of the Soviet Union. In December 1991, the Soviet Union disintegrated, and the Russian Federation was formally established, which marked the end of the Sino-Soviet trade era and the beginning of the Sino-Russian trade era. In January 1992, China and Russia established diplomatic relations at the ambassadorial level, and the two countries

officially started the process of bilateral economic and trade cooperation, including border trade. During this period, both China and Russia were in a critical period of economic system transformation, which had a profound impact on the development of border trade.

From the perspective of Russia's domestic situation, after the collapse of the Soviet Union, Russia implemented a radical economic reform policy, transforming from a planned economy to a market economy. However, due to the lack of mature experience and the irrationality of the reform measures, Russia's economy fell into a serious crisis. The national economic output dropped sharply, inflation soared, the ruble depreciated significantly, the shortage of living materials was serious, and the people's living standards declined. It is estimated that from 1992 to 2000, Russia's GDP decreased by 40 % cumulatively, and the industrial output value decreased by more than 50 %. The severe economic crisis made Russia's foreign trade capacity greatly weakened, and the demand for imported goods was limited, which brought great challenges to the development of Sino-Russian border trade. At the same time, Russia's border management system was not perfect, the customs clearance procedures were cumbersome, and the policy support for border trade was insufficient, which further restricted the development of border trade.

From China's domestic situation, during this period, China was in the critical period of deepening the reform and opening-up policy, and the economy was in a stage of rapid growth. The reform of the economic system was continuously promoted, and the foreign trade system was gradually improved. However, China's border regions, especially the northeast border regions adjacent to Russia, were relatively backward in economic development, with imperfect infrastructure, insufficient industrial foundation and limited foreign trade capacity. In addition, China's understanding of the Russian market was not deep enough, and the variety and quality of export products could not fully meet the needs of the Russian market, which also affected the development of border trade.

In terms of the development characteristics of border trade during this stage, the first is the small scale of trade and great fluctuations. In 1992, the total volume of China-Russia border trade was only 1.23 billion US dollars, accounting for 21 % of the total Sino-Russian trade volume. From 1993 to 1996, with the gradual recovery of Russia's economy and the continuous improvement of China's border trade capacity, the volume of border

trade showed a slow growth trend, reaching 2.15 billion US dollars in 1996. However, due to the impact of the 1998 Russian financial crisis, the ruble depreciated sharply, and the volume of China-Russia border trade dropped to 1.08 billion US dollars in 1998, the lowest level since 1992. It was not until 1999 that the border trade volume began to recover slowly, reaching 1.87 billion US dollars in 2000. During the entire initial recovery stage, the average annual volume of China-Russia border trade was about 1.5 billion US dollars, which was at a low level in the history of Sino-Russian border trade.

The second is the single trade structure and low added value. During this stage, China-Russia border trade was mainly based on the exchange of primary products and labor-intensive products. China's exports to Russia through border trade were mainly light industrial products, textiles, clothing, food, daily necessities and other labor-intensive products, which were characterized by low price, large quantity and low technical content. These products were in line with the demand of the Russian market during the economic crisis, and became the main force of China's border trade exports. Russia's exports to China through border trade were mainly resource products such as timber, coal, non-ferrous metals and agricultural products, as well as some heavy industrial products with low technical content. The single trade structure made the anti-risk ability of China-Russia border trade weak, and it was easily affected by the changes of the international market price and the domestic economic situation of both countries.

The third is the simple trade mode and imperfect trade channels. During this stage, the main mode of China-Russia border trade was barter trade and small-scale border trade. Due to the shortage of foreign exchange in Russia during the economic crisis, barter trade became an important form of border trade. China exchanged light industrial products and daily necessities for Russia's resource products, which solved the problem of insufficient foreign exchange in Russia and met the demand for primary products in China's border regions. At the same time, small-scale border trade, such as border fairs and individual trade, also developed rapidly. However, due to the imperfect management system of border trade, the lack of standardized trade procedures and the existence of problems such as smuggling and fake and shoddy products, the quality and efficiency of border trade were affected to a certain extent. In addition, the formal trade channels between China and

Russia were not smooth, the customs clearance efficiency was low, and the logistics and transportation infrastructure was backward, which also restricted the development of border trade.

In terms of policy support, during this stage, the governments of both China and Russia began to pay attention to the development of border trade and introduced a series of policy measures to promote border trade cooperation. In 1992, the Chinese government issued the Measures for the Administration of Border Trade, which clarified the scope, mode and policy preferences of border trade, and provided policy support for the development of border trade. Russia also introduced policies to simplify customs clearance procedures, reduce import tariffs on some border trade products, and promote the development of border trade. In 1996, China and Russia established a strategic cooperative partnership of equality, trust and mutual benefit oriented towards the 21st century, which laid a solid political foundation for the development of border trade. However, due to the imperfect economic system and the lack of policy implementation capacity of both countries, the role of policy support was not fully played, and the development of border trade was still restricted by many factors.

In general, the initial recovery stage of China-Russia border trade was a period of difficult exploration and restart. Although the scale of trade was small, the structure was single and there were many problems, this stage laid a foundation for the subsequent development of China-Russia border trade. Through continuous exploration and practice, both countries have accumulated valuable experience in border trade cooperation, clarified the direction of border trade development, and laid the foundation for the steady growth of border trade in the next stage.

2 Steady Growth Stage (2001–2008): standardization and expansion under the background of economic recovery [23].

From 2001 to 2008, China-Russia border trade entered a steady growth stage. During this period, the economic situation of both China and Russia improved significantly, the political mutual trust between the two countries was continuously deepened, and the policy environment for border trade was further optimized. These favorable factors jointly promoted the steady growth of China-Russia border trade, and the

border trade showed the characteristics of standardization, expansion and gradual optimization of structure.

From the perspective of the economic background of both countries, Russia's economy recovered rapidly after the 1998 financial crisis, driven by the rising international energy prices and the adjustment of domestic economic policies. From 2001 to 2008, Russia's GDP increased at an average annual rate of 6.7 %, and the national economic strength was significantly enhanced. The improvement of economic strength enabled Russia to increase its demand for imported goods and enhance its ability to pay for foreign trade, which provided a strong impetus for the development of China-Russia border trade. At the same time, Russia continuously improved its border management system, simplified customs clearance procedures, and increased policy support for border trade, which created a favorable environment for the development of border trade.

China's economy maintained a high-speed growth trend during this period, with an average annual GDP growth rate of more than 10 %. The continuous improvement of economic strength and the continuous improvement of the foreign trade system made China's export capacity further enhanced. The border regions of China, especially the northeast border regions, accelerated the pace of economic development, improved infrastructure construction, and strengthened industrial support, which provided a solid foundation for the development of border trade. In addition, China's understanding of the Russian market was continuously deepened, and the variety and quality of export products were continuously improved, which enhanced the competitiveness of Chinese products in the Russian market.

In terms of political mutual trust, the political relations between China and Russia were continuously upgraded during this stage, laying a solid political foundation for the development of border trade. In 2001, China and Russia signed the Treaty of Good-Neighborliness, Friendship and Cooperation between the People's Republic of China and the Russian Federation, which established the long-term stable and mutually beneficial cooperative relationship between the two countries and provided a strong political guarantee for the development of border trade. In the same year, the two countries established a regular meeting mechanism between the prime ministers, which strengthened

the communication and coordination between the governments of the two countries and promoted the solution of practical problems in border trade cooperation. In addition, the two countries carried out in-depth cooperation in international and regional affairs, which further enhanced political mutual trust and created a favorable international environment for the development of border trade.

In terms of the development characteristics of border trade during this stage, the first is the continuous expansion of trade scale and stable growth. The volume of China-Russia border trade increased year by year, from 2.35 billion US dollars in 2001 to 11.87 billion US dollars in 2008, with an average annual growth rate of 25.3 %, which was much higher than the average growth rate of global trade during the same period. The proportion of border trade in the total Sino-Russian trade volume also increased from 21.9 % in 2001 to 20.9 % in 2008 (slightly decreased due to the faster growth of general trade), maintaining a relatively stable proportion. The continuous expansion of trade scale has made border trade an important part of Sino-Russian economic and trade cooperation and a key driving force for the economic development of border regions of both countries.

To more intuitively reflect the growth trend of China-Russia border trade during this stage, the changes in Sino-Russian border trade volume between 2001 and 2008 are shown in figure 1.

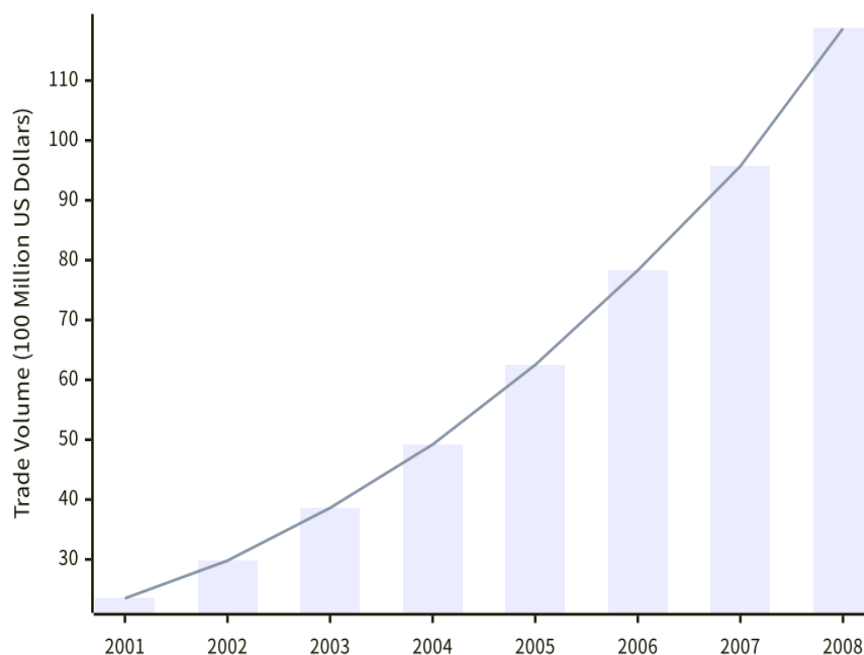


Figure 1 – The volume of China-Russia border trade from 2001 to 2008 [11]

As can be seen from the chart, the volume of China-Russia border trade showed a steady upward trend from 2001 to 2008, with no obvious fluctuations, which fully reflects the steady growth characteristics of border trade during this stage. Among them, the growth rate was the fastest in 2003 and 2004, with a year-on-year growth rate of more than 30 %, which was mainly due to the further recovery of Russia's economy and the continuous optimization of China's border trade policy.

The second is the gradual optimization of trade structure and the increase of high-value-added products. During this stage, China's exports to Russia through border trade were no longer limited to light industrial products and daily necessities, but began to increase the export of mechanical and electrical products, high-tech products and other high-value-added products. In 2008, the export volume of mechanical and electrical products from China to Russia through border trade reached 3.87 billion US dollars, accounting for 32.6 % of the total border trade export volume, an increase of 20 percentage points compared with 2001. Russia's exports to China through border trade were still dominated by resource products, but the variety and quality of products were continuously improved. In addition, the trade of agricultural products and processed products between the two countries through border trade also developed rapidly, enriching the variety of border trade. The following chart shows the structure of China's border trade exports to Russia in 2001 and 2008, which intuitively reflects the optimization of the export structure (figure 2, 3).

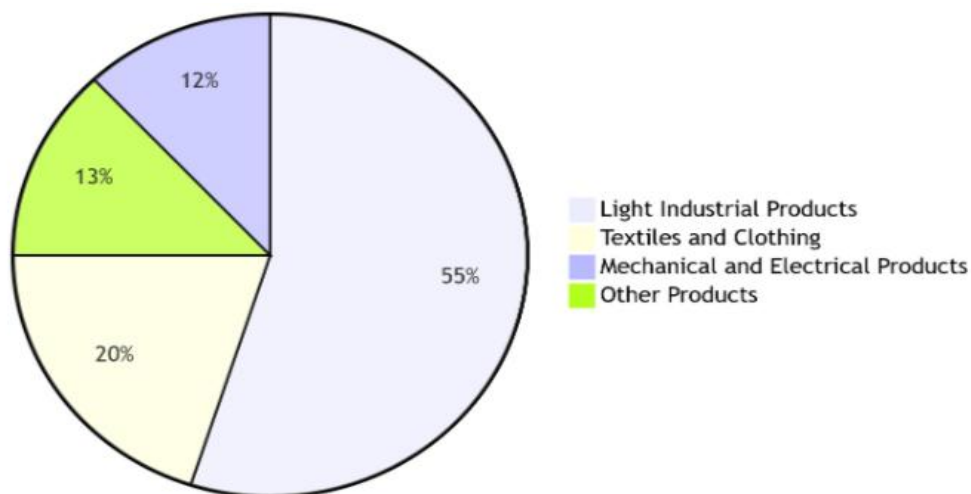


Figure 2 – The structure of China's border trade exports to Russia in 2001 [26]

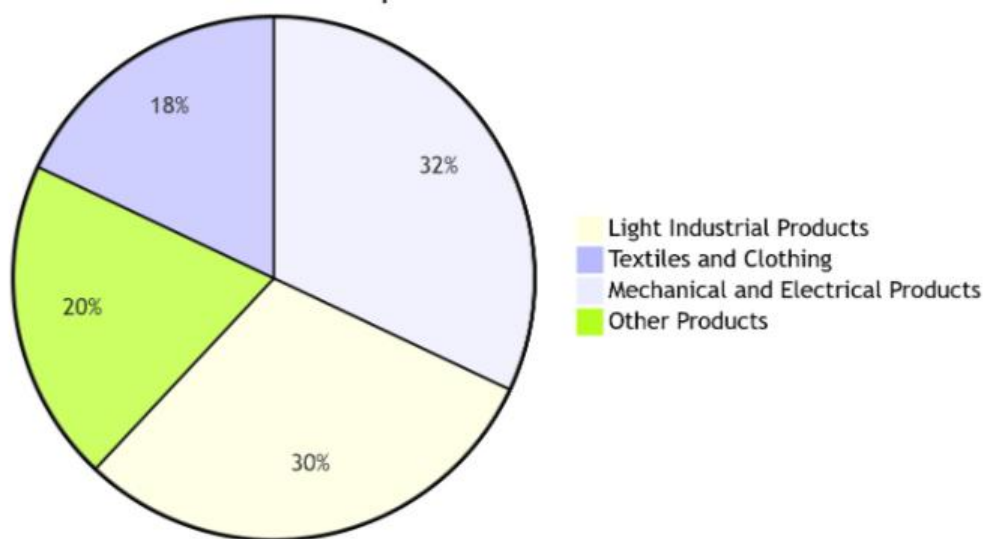


Figure 3 – The structure of China's border trade exports to Russia in 2008 [26]

As can be seen from the chart, the proportion of light industrial products in China's border trade exports to Russia decreased from 55 % in 2001 to 30 % in 2008, while the proportion of mechanical and electrical products increased from 12 % to 32 %, becoming the largest category of China's border trade exports to Russia. This change fully reflects the gradual optimization of China's border trade export structure during this stage.

The third is the standardization of trade mode and the improvement of trade channels. During this stage, the formal trade channels between China and Russia were gradually smoothed, and the proportion of general trade in border trade increased significantly, while the proportion of barter trade and small-scale individual trade gradually decreased. In 2008, the volume of general trade in China-Russia border trade reached 7.58 billion US dollars, accounting for 63.8 % of the total border trade volume, an increase of 30 percentage points compared with 2001. At the same time, the governments of both countries strengthened the management of border trade, improved the border trade management system, standardized trade procedures, and effectively curbed the problems of smuggling and fake and shoddy products, which improved the quality and efficiency of border trade. In addition, the logistics and transportation infrastructure of border regions was continuously improved, the construction of border ports was accelerated, and the customs clearance efficiency was significantly improved, which provided a strong guarantee for the development of border trade.

In terms of policy support, the governments of both China and Russia further strengthened policy support for border trade during this stage, and introduced a series of policies to promote trade facilitation. China has continuously improved the export tax rebate policy for border trade products, simplified the customs clearance procedures, and provided financial support for enterprises engaged in border trade. Russia has also introduced policies to reduce import tariffs on border trade products, optimize the investment environment, and attract Chinese enterprises to invest and trade in Russia's border regions. In addition, the two countries have established a number of border trade cooperation platforms, such as the China-Russia Expo and the border trade fairs, which have provided a good platform for enterprises of both countries to carry out trade cooperation and exchange.

It is worth noting that during this stage, the cooperation in major projects between China and Russia's border regions made important breakthroughs, which strongly promoted the development of border trade. For example, the construction of the Heilongjiang Bridge, which connects Heihe in China and Blagoveshchensk in Russia, started in 2009 (the preliminary preparation work was completed during this stage), which will greatly shorten the transportation distance between the two border regions and promote the flow of goods and personnel, laying a solid foundation for the further development of border trade. In addition, the cooperation in the fields of energy, agriculture and tourism between the border regions of both countries also developed rapidly, which drove the growth of border trade and enriched the connotation of border trade cooperation.

In general, the steady growth stage of China-Russia border trade was a period of rapid development and remarkable achievements. The continuous expansion of trade scale, the gradual optimization of trade structure and the continuous standardization of trade mode have laid a solid foundation for the in-depth development of China-Russia border trade. During this stage, China-Russia border trade has gradually matured, and the cooperative relationship between the two countries in the field of border trade has become more stable, which has laid the foundation for the accelerated development of border trade in the next stage.

3 Accelerated Development Stage (2009–2018): diversification and deepening under the background of initiative docking [38].

From 2009 to 2018, China-Russia border trade entered an accelerated development stage. During this period, the global economic situation was complex and volatile, affected by the 2008 global financial crisis and the European debt crisis, but the economic and trade cooperation between China and Russia maintained a strong momentum of development. With the in-depth advancement of the "Belt and Road" initiative and the docking of the Eurasian Economic Union, China-Russia border trade has achieved leapfrog development, showing the characteristics of diversification, deepening and integration.

In terms of the global economic background, the 2008 global financial crisis had a profound impact on the global economy, leading to a sharp decline in global trade volume and a slowdown in economic growth. However, China and Russia, through active policy adjustments and in-depth cooperation, successfully resisted the impact of the financial crisis and maintained the stable development of their economies. China's economy maintained a medium-high speed growth, with an average annual GDP growth rate of about 7.5 %, and the economic structure was continuously optimized, which provided a strong support for the development of border trade. Russia, relying on its rich energy resources, adjusted its economic structure and maintained a relatively stable economic growth, with an average annual GDP growth rate of about 3.5 %. In addition, the gradual recovery of the global economy after 2010 also created a favorable international environment for the development of China-Russia border trade. It should be noted that the US return to Asia strategy launched at the end of 2009 brought new changes to the international relations in Northeast Asia, which to a certain extent affected the external environment of China-Russia border trade, but the deepening political mutual trust between China and Russia effectively offset the negative impact of this strategic adjustment.

In terms of cooperation mechanisms, the docking of the Belt and Road initiative and the Eurasian Economic Union has become an important driving force for the accelerated development of China-Russia border trade. In 2015, China and Russia officially signed the

Memorandum of Understanding on Aligning the Construction of the Silk Road Economic Belt with the Eurasian Economic Union, which established a top-level design for the docking of the two initiatives and clarified the key areas and cooperation priorities of border trade development. On this basis, the two countries have established a special docking mechanism for border trade, including the China-Russia Prime Ministers' Regular Meeting Mechanism, the China-Russia Border Trade Cooperation Working Group, and the Provincial-Level Cooperation Mechanism between Chinese border provinces and Russian federal subjects. These mechanisms have effectively promoted policy coordination, information exchange and problem-solving between the two sides, breaking down institutional and institutional barriers that restricted the development of border trade in the past.

Specifically, in terms of policy coordination, China and Russia have jointly formulated and implemented a series of policies to promote border trade facilitation, including mutual recognition of commodity inspection standards, simplification of customs clearance procedures, and mutual exemption of some border trade products from tariffs. For example, in 2016, the two countries launched the Single Window customs clearance system at key border ports such as Suifenhe, Manzhouli and Heihe, which reduced the customs clearance time by more than 50 % and greatly improved the efficiency of cross-border goods flow. In addition, the two countries have also strengthened cooperation in cross-border currency settlement, promoted the use of RMB and ruble in border trade settlement, and reduced the risks and costs brought by exchange rate fluctuations to enterprises. By 2018, the proportion of RMB settlement in China-Russia border trade had reached 28.3 %, an increase of 15 percentage points compared with 2009.

In terms of regional cooperation practice, four major border economic cooperation belts centered on Heilongjiang, Jilin, Inner Mongolia and Xinjiang have been gradually formed during this stage, each with its own characteristics and complementary advantages, forming a pattern of coordinated development of China-Russia border trade (figure 4).

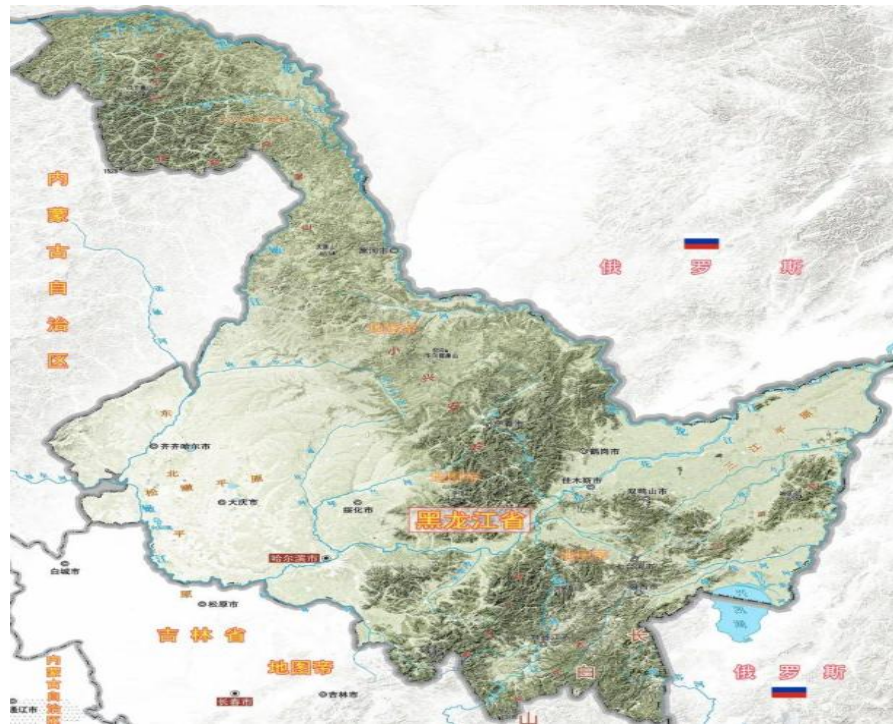


Figure 4 – Map of the Border between Heilongjiang and Russia [34]

Heilongjiang Province, as the province with the longest border line with Russia, relies on its geographical advantages and industrial foundation to focus on developing cross-border logistics, bulk commodity trade and deep processing trade (figure 4). The Suifenhe Comprehensive Bonded Zone, established in 2014, has become an important platform for Heilongjiang's border trade transformation, realizing the integration of import and export, processing, logistics and bonded services. In 2018, the trade volume of Suifenhe Port reached 8.76 billion US dollars, accounting for 35.6 % of Heilongjiang's total border trade volume.

Jilin Province focuses on the development of border tourism, agricultural product trade and cross-border e-commerce, taking Hunchun Port as the core to build a cross-border economic cooperation zone connecting China, Russia and the DPRK (figure 5). The Hunchun Cross-Border E-Commerce Pilot Zone, approved in 2018, has introduced a number of well-known e-commerce platforms, realizing online transaction, offline customs clearance and integrated logistics distribution.



Figure 5 – Border Map of Jilin, North Korea and Russia [34]

In 2018, the cross-border e-commerce trade volume of Jilin's border trade reached 1.23 billion US dollars, a year-on-year increase of 45.7 %. At the same time, Jilin has strengthened agricultural cooperation with the Russian Far East, built a number of cross-border agricultural product planting and processing bases, and the export volume of agricultural products through border trade reached 2.15 billion US dollars in 2018.

Inner Mongolia Autonomous Region, relying on its adjacency to Russia's Siberian region, focuses on energy and mineral trade, cross-border service outsourcing and border tourism. Manzhouli Port, the largest land port in China, has become an important channel for Russia's energy and mineral products to enter China (figure 6).



Figure 6 – Border Map of Inner Mongolia and Russia [34]

In 2018, the import volume of coal, oil and other energy products through Manzhouli Port reached 12.3 million tons, accounting for 42.8 % of Inner Mongolia's total border trade import volume. In addition, Inner Mongolia has also developed cross-border service outsourcing business, focusing on software development, data processing and other fields, and the service trade volume of border trade reached 3.87 billion US dollars in 2018.

Xinjiang Uygur Autonomous Region, as an important gateway for China's westward opening, focuses on mechanical and electrical products export, energy transit and cross-border warehousing and distribution (figure 7). The Alashankou Port, an important node of the China-Europe Railway Express, has become a key channel for China's mechanical and electrical products to be exported to Russia and Central Asia. In 2018, the export volume of mechanical and electrical products through Alashankou Port reached 4.56 billion US dollars, accounting for 68.3 % of Xinjiang's total border trade export volume. At the same time, Xinjiang has strengthened energy transit cooperation with Russia, built a number of cross-border oil and gas pipelines and energy transit stations, and the energy transit trade volume reached 2.78 billion US dollars in 2018.



Figure 7 – Border Map of Xinjiang and Russia [34]

In terms of trade scale, China-Russia border trade achieved leapfrog growth during the accelerated development stage (2009–2018). Affected by the post-2008 financial crisis, the total border trade volume dropped slightly to 10.26 billion US dollars in 2009, but then rebounded rapidly. In 2014, the border trade volume broke through the 20 billion US dollar mark for the first time, reaching 21.35 billion US dollars. Although affected by the depreciation of the ruble and the economic recession in Russia from 2015 to 2016, the border trade volume remained above 18 billion US dollars, showing strong resilience. By 2018, the total volume of China-Russia border trade reached 24.58 billion US dollars, which was 2.39 times that of 2009, with an average annual growth rate of 9.8 %. The proportion of border trade in the total Sino-Russian trade volume also increased from 18.4 % in 2009 to 23.1 % in 2018, becoming an increasingly important part of Sino-Russian economic and trade cooperation.

To more intuitively present the changes in China-Russia border trade volume during its rapid development phase, the relevant data from 2009 to 2018 are shown in figure 8.

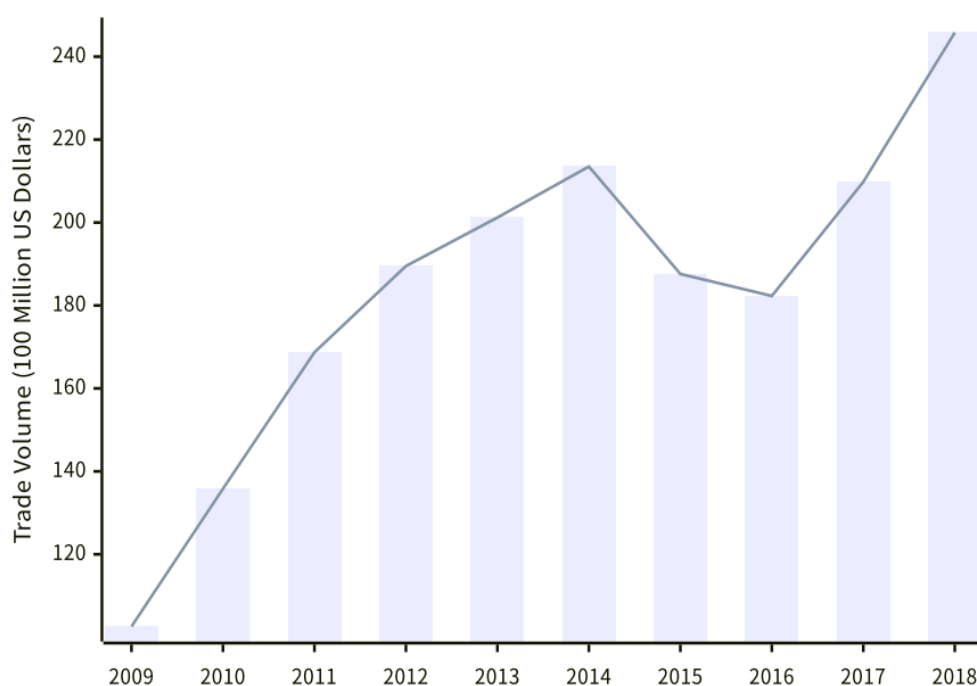


Figure 8 – The China-Russia border trade volume from 2009 to 2018 [38]

As can be seen from the chart, the China-Russia border trade volume showed an overall upward trend from 2009 to 2018, with a short-term adjustment in 2015–2016. This is mainly due to the impact of the global economic downturn and the depreciation of the ruble, but the overall resilience of border trade is strong. After 2017, with the recovery of Russia's economy and the deepening of the docking of the two initiatives, the border trade volume rebounded rapidly, achieving a new high in 2018.

In terms of trade structure, the commodity structure of China-Russia border trade during this stage was further optimized, breaking the long-term pattern dominated by primary products and labor-intensive products. On the export side, the proportion of high-value-added products such as mechanical and electrical equipment, transportation vehicles, high-tech products and processed agricultural products continued to rise. In 2018, the export volume of mechanical and electrical products from China to Russia through border trade reached 9.87 billion US dollars, accounting for 40.2 % of the total border trade export volume, an increase of 7.6 percentage points compared with 2008. The export volume of processed agricultural products reached 3.25 billion US dollars, accounting for 13.2 % of the total export volume, an increase of 8.5 percentage points compared with 2008. On the import side, Russia's exports to China through border trade were no longer

limited to traditional resource products such as timber and coal, but gradually expanded to high-quality agricultural products, chemical raw materials and mechanical and electrical parts. In 2018, the import volume of agricultural products from Russia through border trade reached 4.56 billion US dollars, accounting for 18.5 % of the total border trade import volume, an increase of 12.3 percentage points compared with 2008.

The following chart shows the structure of China-Russia border trade imports and exports in 2018, which intuitively reflects the optimization of the trade structure during this stage (figure 9, 10).

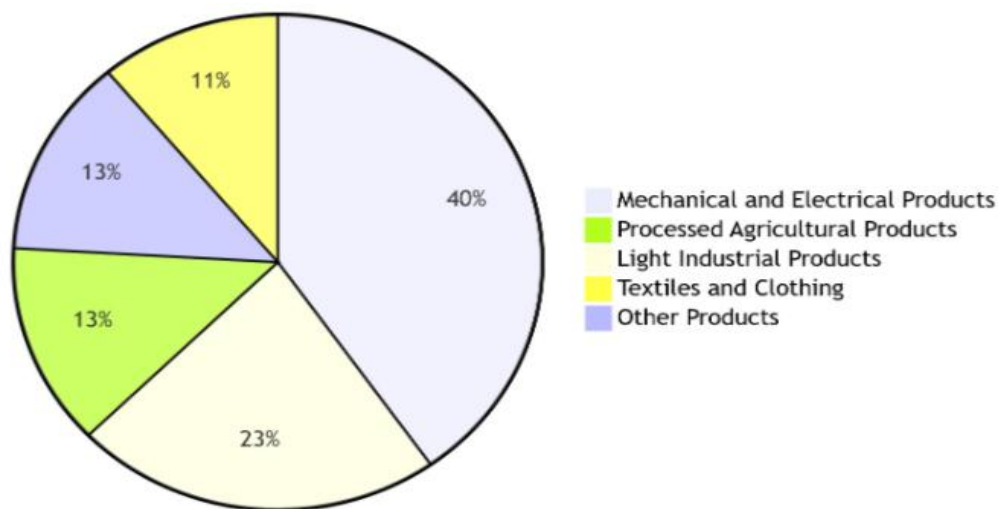


Figure 9 – The structure of China-Russia border trade exports in 2018 [21]

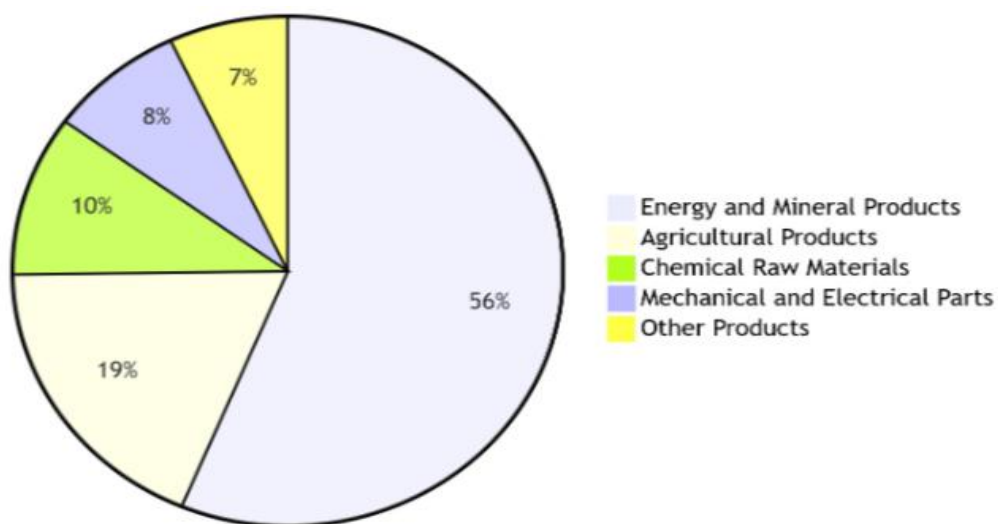


Figure 10 – The structure of China-Russia border trade imports in 2018 [21]

As can be seen from the chart, mechanical and electrical products have become the largest category of China's border trade exports to Russia, while energy and mineral products still account for the largest proportion of imports, but the proportion of agricultural products and other high-value-added products has increased significantly, indicating that the trade structure of China-Russia border trade is moving towards diversification and high-quality.

In terms of trade mode innovation, traditional trade modes such as general trade and small-scale border trade were further standardized and upgraded during this stage, while new trade formats represented by cross-border e-commerce, cross-border processing trade, market procurement trade and cross-border tourism shopping trade developed rapidly, injecting new vitality into the development of border trade. Cross-border e-commerce, in particular, has become a new growth point of China-Russia border trade. With the support of policies such as the cross-border e-commerce pilot zones established in Suifenhe, Hunchun and Alashankou, a number of cross-border e-commerce platforms such as AliExpress and JD Global have settled in border areas, realizing the integration of online transaction, offline customs clearance, logistics distribution and after-sales service. In 2018, the cross-border e-commerce trade volume of China-Russia border trade reached 3.87 billion US dollars, accounting for 15.7 % of the total border trade volume, which was almost zero in 2009.

Cross-border processing trade has also achieved remarkable development during this stage. China's border regions have built a number of cross-border industrial parks and processing bases, importing raw materials from Russia for deep processing and then exporting the finished products to Russia or other countries. For example, the Manzhouli Cross-Border Processing Industrial Park, established in 2012, focuses on the deep processing of timber and mineral products, with an annual processing capacity of 1 million cubic meters of timber and 500,000 tons of mineral products. In 2018, the trade volume driven by processing trade in Manzhouli reached 2.35 billion US dollars, accounting for 28.6 % of the total trade volume of Manzhouli Port. In addition, market procurement trade and cross-border tourism shopping trade have also developed rapidly, further enriching the trade modes of China-Russia border trade.

In terms of infrastructure construction, the governments of both China and Russia have increased investment in border infrastructure during this stage, focusing on improving the construction of border ports, cross-border transportation and logistics facilities, which has provided a strong guarantee for the accelerated development of border trade. In terms of border ports, the two countries have upgraded and expanded a number of key border ports such as Manzhouli, Suifenhe, Heihe and Alashankou, improving the port handling capacity and customs clearance efficiency. For example, the Heihe-Blagoveshchensk Highway Bridge, which started construction in 2009 and was completed and opened to traffic in 2019, has shortened the transportation distance between Heihe and Blagoveshchensk from 190 kilometers to 10 kilometers, greatly facilitating the flow of goods and personnel between the two sides. In terms of cross-border transportation, the China-Europe Railway Express has become an important channel for China-Russia border trade, with the number of trains increasing from 17 in 2011 to 3673 in 2018, covering major border ports and cities of both countries. In terms of logistics facilities, the two countries have built a number of cross-border logistics parks and warehouses, improving the efficiency of cross-border logistics and reducing logistics costs.

In terms of policy support, the governments of both China and Russia have further strengthened policy support for border trade during this stage, introducing a series of policies to promote the development of border trade. China has continuously improved the export tax rebate policy for border trade products, expanded the scope of preferential policies, and provided financial support and credit guarantees for enterprises engaged in border trade. For example, the Chinese government has set up a special fund for border trade development, providing financial support for the upgrading of border trade enterprises and the construction of infrastructure. Russia has also introduced policies to reduce import tariffs on border trade products, optimize the investment environment, and attract Chinese enterprises to invest and trade in Russia's border regions. In addition, the two countries have jointly held the China-Russia Expo, the Border Trade Fair and other cooperation platforms, providing a good platform for enterprises of both countries to carry out trade cooperation and exchange.

In general, the accelerated development stage of China-Russia border trade (2009–

2018) was a period of leapfrog development with remarkable achievements. With the docking of the Belt and Road initiative and the Eurasian Economic Union as the driving force, the four major border regions have formed a pattern of differentiated development, the trade scale has achieved rapid expansion, the trade structure has been continuously optimized, the trade mode has been innovated and upgraded, and the infrastructure has been continuously improved. These achievements have laid a solid foundation for the high-quality transformation of China-Russia border trade in the next stage, and also made border trade an important bridge for deepening Sino-Russian economic and trade cooperation and promoting the economic development of border regions.

4 High-quality Transformation Stage (2019 – Present): quality improvement and structure upgrading under the background of complex changes [68].

Since 2019, China-Russia border trade has entered a high-quality transformation stage, which is closely related to the profound changes in the global geopolitical pattern, the reconstruction of the international industrial chain and supply chain, the impact of public health emergencies, and the deep upgrading of the domestic economic structures of both countries. Different from the previous scale-driven growth model, the high-quality transformation stage of China-Russia border trade focuses on quality improvement, structure optimization, format upgrading and institutional innovation, and the development logic has undergone a fundamental transformation.

From the external environment, global trade protectionism and unilateralism have risen significantly since 2019, and the uncertainty of the international economic environment has increased sharply. The Sino-US trade frictions, the conflict between Russia and Ukraine, and other geopolitical factors have brought great impact on the global industrial chain and supply chain, and also affected the development of China-Russia border trade. The outbreak of COVID-19 in 2020 has caused severe impacts on global personnel flow, logistics transportation and port customs clearance, leading to a short-term decline in China-Russia border trade volume. In 2020, the total volume of China-Russia border trade dropped to 19.87 billion US dollars, a year-on-year decrease of 19.2 %. However, with the joint efforts of both countries to promote the resumption of work and production and optimize the customs clearance process, the border trade volume recovered

rapidly in 2021, reaching 23.45 billion US dollars, a year-on-year increase of 18.0 %. At the same time, the modern economy is accelerating towards digitalization, intelligence and greening, putting forward new requirements for the traditional commodity structure, trade mode and operation management mode of border trade. Traditional labor-intensive and resource-dependent border trade can no longer adapt to the new competition pattern of the modern economy, forcing border trade to accelerate transformation and upgrading.

From the bilateral internal environment, China is accelerating the construction of a new development pattern with domestic circulation as the main body and domestic and international dual circulation promoting each other, promoting industrial upgrading, digital economy development and high-level opening to the outside world. The 14th Five-Year Plan clearly proposes to strengthen border trade and cross-border economic cooperation zones, and promote the high-quality development of border trade, which provides a policy orientation for the transformation of China-Russia border trade. China's border regions are accelerating the transformation of economic development mode, focusing on developing high-tech industries, digital economy and green economy, and improving the added value of border trade products. Russia has further strengthened the economic development strategy of the Far East and Siberian regions, increased policy support for border regions, accelerated infrastructure construction and industrial layout, and continuously expanded market demand for Chinese manufactured goods, agricultural products and modern service industries. In 2022, Russia launched the Far East Development Plan 2030, which focuses on improving the infrastructure of the Far East region, attracting foreign investment, and strengthening economic and trade cooperation with China, which provides new opportunities for the high-quality transformation of China-Russia border trade.

In terms of political mutual trust, the comprehensive strategic cooperative partnership between China and Russia has entered a new era, and the political mutual trust between the two countries has reached an unprecedented level. In 2022, China and Russia issued a Joint Statement on Deepening the Comprehensive Strategic Cooperative Partnership for a New Era, which clearly pointed out that we will strengthen border trade cooperation, optimize the trade structure, innovate trade modes, and promote the high-quality development of border trade. The two countries have further strengthened

communication and coordination in border trade affairs, established a more efficient cooperation mechanism, and provided a strong political guarantee for the high-quality transformation of border trade.

The development characteristics of China-Russia border trade in the high-quality transformation stage are mainly reflected in the following aspects: first, the trade scale maintains steady operation with strong resilience. Although affected by the epidemic and geopolitical factors, the border trade volume has experienced short-term fluctuations, but the overall trend is stable. In 2023, the total volume of China-Russia border trade reached 27.89 billion US dollars, a new high, which was 13.5% higher than that in 2018. The anti-risk capability and market resilience of border trade have been significantly enhanced. Second, the structural transformation has been further advanced, and the proportion of high-value-added products, digital trade and green trade has continued to rise. On the export side, high-tech products, intelligent equipment, green environmental protection products and other high-value-added products have become the new growth points of border trade exports. In 2023, the export volume of high-tech products from China to Russia through border trade reached 4.56 billion US dollars, accounting for 16.3 % of the total border trade export volume, an increase of 10.2 percentage points compared with 2018. On the import side, the import volume of high-quality agricultural products, high-end chemical products and advanced technology from Russia has increased significantly. Third, the digital transformation of trade mode has accelerated, and cross-border e-commerce, digital trade and other new formats have developed rapidly. The popularity of digital technologies such as 5G, big data and artificial intelligence has promoted the transformation of border trade from offline to online, and from traditional trade to digital trade. In 2023, the cross-border e-commerce trade volume of China-Russia border trade reached 7.89 billion US dollars, accounting for 28.3 % of the total border trade volume, which was more than twice that in 2018. Fourth, the institutional opening-up of border areas has been accelerated, and the reform of the border trade management system, cross-border RMB settlement, and the liberalization and facilitation of personnel entry and exit have been continuously promoted. The two countries have further simplified customs clearance procedures, promoted the mutual recognition of inspection and quarantine

standards, and improved the level of trade facilitation. In 2023, the average customs clearance time of China-Russia border ports was shortened to 2.5 hours, a decrease of 60 % compared with 2019.

To more intuitively reflect the changes in China-Russia border trade volume during the high-quality transformation stage, the data from 2019 to 2023 are presented in figure 11.

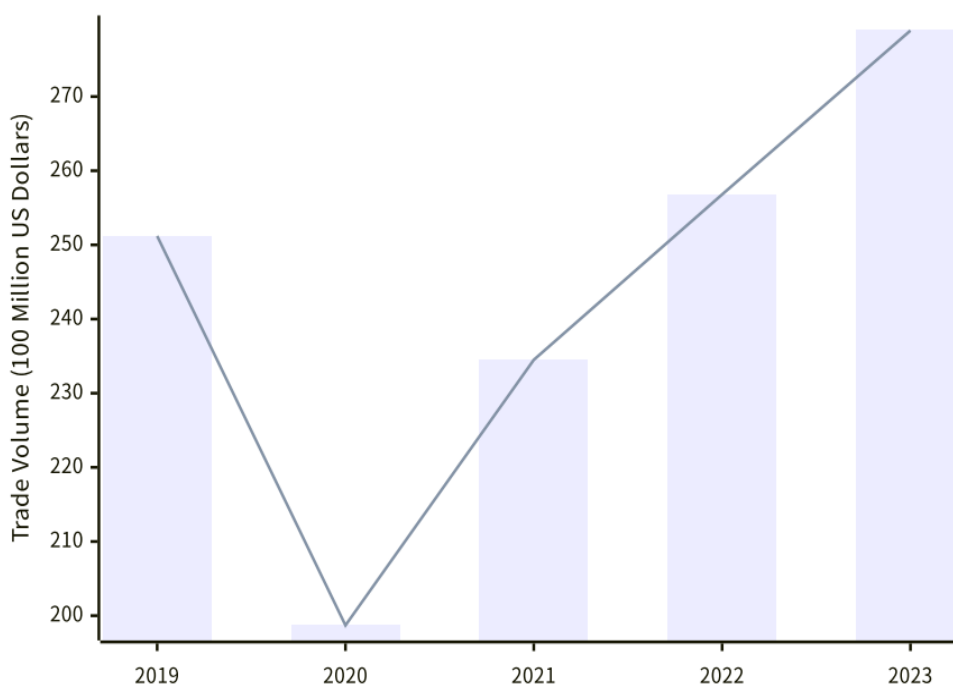


Figure 11 – The China-Russia border trade volume from 2019 to 2023 [68]

As can be seen from the chart, the China-Russia border trade volume showed a trend of decline-recovery-growth from 2019 to 2023. The short-term decline in 2020 was mainly affected by the COVID-19 epidemic, but with the joint efforts of both countries, the border trade volume recovered rapidly and achieved steady growth, reaching a new high in 2023, which fully reflects the strong resilience and development potential of China-Russia border trade in the high-quality transformation stage.

In terms of regional cooperation, the four major border regions (Heilongjiang, Jilin, Inner Mongolia and Xinjiang) have further clarified their positioning and accelerated the pace of high-quality transformation. Heilongjiang Province focuses on building a China-Russia cross-border logistics and trade hub, accelerating the construction of cross-border railway, highway and waterway channels, and promoting the integration of logistics, trade

and industry. The Heihe Cross-Border Economic Cooperation Zone, approved in 2020, has become an important platform for Heilongjiang's border trade transformation, focusing on developing digital trade, high-tech manufacturing and cross-border services. In 2023, the trade volume of Heihe Port reached 9.87 billion US dollars, a year-on-year increase of 12.3 %.

Jilin Province focuses on building a China-Russia cross-border agricultural and tourism cooperation hub, strengthening cross-border agricultural industrial chain cooperation with the Russian Far East, and developing high-end border tourism products. The Hunchun Cross-Border Economic Cooperation Zone has built a number of cross-border agricultural product processing bases and cold chain logistics facilities, realizing the integration of planting, processing, storage and transportation of agricultural products. In 2023, the export volume of agricultural products through Jilin's border trade reached 3.25 billion US dollars, a year-on-year increase of 15.7 %. At the same time, Jilin has developed high-end border tourism products such as China-Russia cross-border self-driving tour and cultural heritage tour, attracting a large number of Chinese and Russian tourists, and the border tourism income reached 1.87 billion US dollars in 2023.

Inner Mongolia Autonomous Region focuses on building a China-Russia cross-border energy and green economy cooperation hub, deepening cooperation with Russia's Siberian region in energy development, green energy and environmental protection, and promoting the transformation of energy trade from primary product export to deep processing and green development. The Manzhouli Cross-Border Green Energy Industrial Park, established in 2021, focuses on the development of new energy products such as solar energy and wind energy, and the export volume of green energy products reached 1.23 billion US dollars in 2023. In addition, Inner Mongolia has also strengthened cooperation in cross-border carbon trading, exploring a new path for green border trade development.

Xinjiang Uygur Autonomous Region focuses on building a China-Russia-West Asia cross-border trade hub, relying on the China-Europe Railway Express and the West Land-Sea Corridor, expanding the radiation scope of border trade, and promoting the transformation of border trade from regional trade to transcontinental trade. The

Alashankou Cross-Border Digital Trade Industrial Park, established in 2022, has introduced a number of digital trade enterprises, realizing the digital transformation of border trade. In 2023, the cross-border e-commerce trade volume of Alashankou Port reached 3.87 billion US dollars, accounting for 45.6 % of Xinjiang's total border trade e-commerce volume.

In terms of policy support and institutional innovation, the governments of both China and Russia have introduced a series of policies to promote the high-quality transformation of border trade. China has further optimized the border trade policy system, expanded the scope of cross-border e-commerce pilot zones, promoted the pilot reform of cross-border RMB settlement, and provided financial support for the transformation and upgrading of border trade enterprises. For example, the Chinese government has introduced tax incentives for high-tech products exported through border trade, and provided subsidies for enterprises engaged in digital trade and green trade. Russia has also introduced policies to improve the investment environment of border regions, reduce the tax burden of enterprises, and strengthen cooperation with China in digital economy and green economy. In addition, the two countries have further strengthened cooperation in the construction of border trade rules, promoting the mutual recognition of standards, mutual trust of supervision and mutual benefit of policies, and creating a more stable and predictable policy environment for the high-quality transformation of border trade.

It is worth noting that the high-quality transformation of China-Russia border trade is also facing some challenges, such as the impact of geopolitical factors, the imperfection of cross-border infrastructure, the uneven development of border regions, and the lack of core competitiveness of enterprises. However, with the deepening of China-Russia comprehensive strategic cooperative partnership, the continuous optimization of the policy environment, and the joint efforts of both countries, the high-quality transformation of China-Russia border trade will surely achieve greater progress. In general, the high-quality transformation stage of China-Russia border trade is a period of transformation and upgrading with both opportunities and challenges. The transformation of development mode, the optimization of trade structure and the innovation of trade mode will further enhance the quality and efficiency of China-Russia border trade, and make it play a more

important role in deepening Sino-Russian economic and trade cooperation and promoting the economic development of border regions of both countries.

To sum up, the evolution of China-Russia border trade from 1992 to the present has gone through four distinct stages, each of which corresponds to the changes in the domestic and foreign economic environment of both countries and the adjustment of bilateral cooperative relations. From the initial recovery stage of difficult exploration, to the steady growth stage of standardization and expansion, then to the accelerated development stage of diversification and deepening driven by the docking of major initiatives, and finally to the current high-quality transformation stage focusing on quality improvement, China-Russia border trade has achieved a qualitative leap from scale expansion to quality improvement, and its role in Sino-Russian economic and trade cooperation has become increasingly prominent. The evolution process not only reflects the resilience and vitality of China-Russia border trade, but also records the deepening of bilateral economic and trade cooperation and the continuous improvement of the modern economic system of both countries.

1.2 Current characteristics and core status of China-Russia border trade transformation in the modern economy

Against the background of the modern economy, China-Russia border trade, while undergoing phased evolution, has gradually formed distinctive current characteristics in the process of transformation and upgrading, and its core status in Sino-Russian economic and trade cooperation and regional economic development has become increasingly prominent. This section focuses on analyzing the current characteristics of China-Russia border trade transformation, clarifying its core status in the modern economic pattern, and laying a foundation for in-depth analysis of trade volume, structure and regional distribution in the next section.

The current characteristics of China-Russia border trade transformation are closely combined with the development trend of the modern economy, showing the integration of

digitalization, greening, diversification and institutionalization. These characteristics are not only the embodiment of the transformation and upgrading of China-Russia border trade, but also the inevitable result of the docking of the economic development strategies of both countries and the adaptation to the global economic pattern.

First, the digital transformation is accelerating [18], and new trade formats have become a new driving force for transformation. In the context of the digital economy, digital technologies such as 5G, big data, artificial intelligence and blockchain have been widely applied in China-Russia border trade, promoting the transformation of trade mode from traditional offline trade to online-offline integration. Cross-border e-commerce, digital trade, cross-border live streaming and other new formats have developed rapidly, breaking the time and space constraints of traditional border trade, reducing transaction costs and improving trade efficiency. As mentioned earlier, the cross-border e-commerce trade volume of China-Russia border trade reached 7.89 billion US dollars in 2023, accounting for 28.3 % of the total border trade volume, which has become an important growth point of border trade. At the same time, digital logistics, digital customs clearance and digital payment have been continuously promoted, forming a complete digital trade ecosystem. For example, the Single Window customs clearance system has been upgraded and optimized, realizing the digitalization of customs clearance procedures, and the customs clearance efficiency has been greatly improved. The cross-border RMB settlement system has been continuously improved, and digital payment tools such as mobile payment have been widely used in border trade, reducing the risks and costs of cross-border capital flow.

Second, the green transformation has become a new direction [15], and green trade has gradually become a key focus of cooperation. With the global emphasis on environmental protection and the promotion of green development strategies by both China and Russia, green trade has become an important part of China-Russia border trade transformation. Both countries have strengthened cooperation in green energy, environmental protection products, circular economy and other fields, promoting the transformation of border trade from resource-dependent to green and low-carbon. On the export side, China's green environmental protection products, new energy equipment,

energy-saving and emission-reduction technologies and other products have been increasingly exported to Russia through border trade, and the export volume has maintained a rapid growth trend. In 2023, the export volume of green products in China-Russia border trade reached 3.25 billion US dollars, a year-on-year increase of 22.3 %. On the import side, Russia's green agricultural products, organic food and other products have also been favored by Chinese consumers, and the import volume has increased significantly. In addition, both countries have strengthened cooperation in cross-border carbon trading, explored the establishment of a cross-border carbon emission trading mechanism, and promoted the green development of border trade. The Manzhouli Cross-Border Green Energy Industrial Park and other cooperation platforms have been built and put into operation, providing a carrier for green trade cooperation between the two countries.

Third, the trade structure is continuously optimized, and the proportion of high-value-added products is steadily increasing. In the process of transformation, China-Russia border trade has gradually got rid of the long-term pattern dominated by primary products and labor-intensive products, and the trade structure has moved towards high-quality and diversification. On the export side, the proportion of high-tech products, intelligent equipment, mechanical and electrical products and other high-value-added products has continued to rise, and the technological content and added value of export products have been significantly improved. In 2023, the export volume of high-tech products and mechanical and electrical products in China-Russia border trade accounted for more than 56 % of the total export volume, becoming the main force of border trade exports. On the import side, while maintaining the import of energy and mineral products, Russia's high-quality agricultural products, high-end chemical products, advanced technology and other products have been continuously increased, enriching the variety of imported products and improving the quality of imports. The optimization of the trade structure not only improves the anti-risk ability of China-Russia border trade, but also promotes the upgrading of the industrial structure of border regions of both countries.

Fourth, the institutional opening-up is deepened, and the trade facilitation level is continuously improved. With the docking of the Belt and Road initiative and the Eurasian

Economic Union, China and Russia have further strengthened policy coordination and institutional innovation, and continuously improved the level of trade facilitation [21]. The two countries have simplified customs clearance procedures, promoted the mutual recognition of inspection and quarantine standards, tariff reduction and exemption of some products, and created a more convenient policy environment for border trade. The average customs clearance time of China-Russia border ports has been shortened to 2.5 hours in 2023, a decrease of 60 % compared with 2019. At the same time, the two countries have strengthened cooperation in cross-border logistics, built a number of cross-border logistics parks and transportation channels, improved the efficiency of cross-border goods flow, and reduced logistics costs. In addition, the cross-border RMB settlement business has been continuously expanded, and the proportion of RMB settlement in border trade has increased year by year, reducing the impact of exchange rate fluctuations on enterprises and improving the stability of border trade.

Fifth, regional cooperation is deepened, and the pattern of differentiated development is further formed. The four major border regions of China (Heilongjiang, Jilin, Inner Mongolia and Xinjiang) have further clarified their development positioning according to their own geographical advantages and industrial foundation, forming a pattern of differentiated development and coordinated promotion. Heilongjiang focuses on cross-border logistics and bulk commodity trade, Jilin focuses on cross-border agriculture and tourism, Inner Mongolia focuses on energy and green economy, and Xinjiang focuses on transcontinental trade and digital trade. This differentiated development pattern not only gives full play to the comparative advantages of each region, but also promotes the overall development of China-Russia border trade, forming a joint force for border trade transformation and upgrading. At the same time, the cooperation between Chinese border regions and Russian federal subjects has been further deepened, and a number of cross-border economic cooperation zones, industrial parks and cooperation platforms have been built, providing a carrier for regional cooperation and promoting the integrated development of border regions (figure 12).

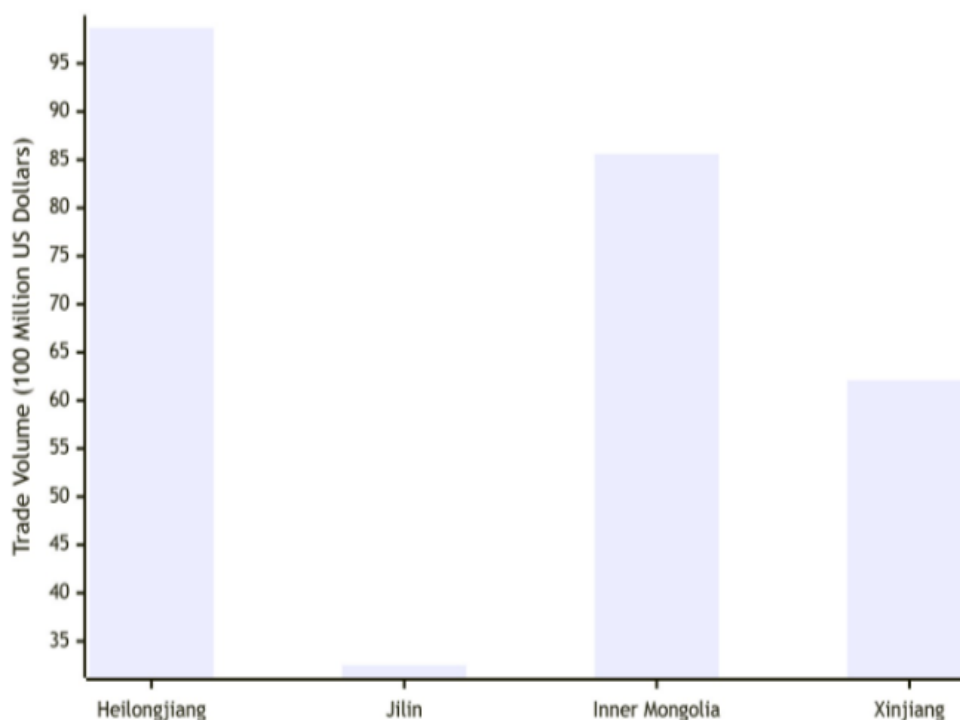


Figure 12 – Order trade volume of four major border regions [34]

In terms of the core status of China-Russia border trade transformation in the modern economy, it is mainly reflected in three aspects: it is an important link in deepening Sino-Russian economic and trade cooperation, a key driving force for the economic development of border regions of both countries, and an important window for China's high-level opening-up to the north.

First, China-Russia border trade is an important link in deepening Sino-Russian economic and trade cooperation. As a special form of Sino-Russian economic and trade cooperation, border trade relies on geographical proximity and cultural affinity, which has the advantages of low transaction costs, fast circulation and strong pertinence. It not only enriches the content of Sino-Russian economic and trade cooperation, but also promotes the in-depth development of bilateral cooperation in various fields such as energy, agriculture, manufacturing and services. In recent years, the proportion of China-Russia border trade in the total Sino-Russian trade volume has remained above 20 %, and it has become an important part of Sino-Russian economic and trade cooperation. The transformation and upgrading of border trade has further promoted the optimization of the total Sino-Russian trade structure, enhanced the stability and sustainability of bilateral

economic and trade cooperation, and laid a solid foundation for the deepening of the comprehensive strategic cooperative partnership between China and Russia.

Second, China-Russia border trade is a key driving force for the economic development of border regions of both countries. China's border regions are mostly underdeveloped areas, and border trade has become an important pillar of the economic development of these regions. The development of border trade has promoted the development of related industries such as logistics, transportation, commerce and tourism in border regions, created a large number of employment opportunities, increased the income of residents in border regions, and narrowed the economic gap between border regions and inland regions. For example, in Heilongjiang, Jilin, Inner Mongolia and Xinjiang, the trade volume of border ports accounts for a large proportion of the total economic volume of the region, and border trade has become an important driving force for the economic growth of these regions. For Russia, the border regions such as the Far East and Siberia also rely on border trade to promote economic development, attract foreign investment, and improve the living standards of residents. The transformation and upgrading of border trade has further enhanced the economic vitality of border regions, promoted the optimization of the industrial structure of border regions, and laid a foundation for the high-quality development of border regions.

Third, China-Russia border trade is an important window for China's high-level opening-up to the north. In the context of China's high-level opening-up strategy, the northward opening-up is an important part of China's opening-up pattern. China-Russia border trade, as an important carrier of northward opening-up, has played an important role in connecting China with Russia and even the Eurasian Economic Union. Through border trade, China's high-quality products, technologies and services have been exported to Russia and other Eurasian countries, and the resources and markets of Russia and other countries have been introduced into China, promoting the two-way flow of resources and elements. The transformation and upgrading of border trade has further improved China's opening-up level to the north, enhanced the radiation capacity of China's border regions, and promoted the integration of China's economy into the Eurasian economic circle.

In addition to the three core statuses mentioned above, China-Russia border trade

also plays an irreplaceable role in promoting people-to-people and cultural exchanges between the two countries and maintaining regional peace and stability in the modern economic pattern. As an important bridge connecting the border regions of China and Russia, border trade not only drives the flow of goods and capital, but also promotes the frequent exchanges of people, culture, technology and other elements between the two countries. The close trade cooperation has laid a solid social foundation for the people-to-people and cultural exchanges between the two countries. A large number of border residents have carried out mutual exchanges and cooperation relying on border trade, and various cross-border cultural exchange activities, folk fairs and educational cooperation projects have been carried out in an orderly manner, which has continuously narrowed the psychological distance between the two peoples and enhanced mutual understanding and friendship.

Against the background of complex global geopolitical changes, the stable development of China-Russia border trade has become an important stabilizer for regional peace and stability. The deepening of border trade cooperation has strengthened the economic interdependence between the border regions of both countries, reduced the potential risks of regional conflicts, and promoted the joint maintenance of border stability and regional security by both countries. For example, the joint management of border ports, the joint crackdown on cross-border smuggling and other illegal activities, and the joint response to public health emergencies and natural disasters have all been effectively promoted on the basis of border trade cooperation, which has fully reflected the positive role of border trade in maintaining regional peace and stability.

To sum up, the transformation of China-Russia border trade in the modern economy has formed distinct characteristics of digitalization, greening, diversification and institutionalization, which are closely integrated with the development trend of the modern economy and the strategic needs of both countries. In terms of core status, China-Russia border trade is not only an important link to deepen Sino-Russian economic and trade cooperation, a key driving force to promote the economic development of border regions of both countries, and an important window for China's high-level opening-up to the north, but also an important bond to promote people-to-people and cultural exchanges between

the two countries and maintain regional peace and stability. The formation of these characteristics and the consolidation of core status are not only the result of the phased evolution of China-Russia border trade, but also the inevitable requirement of the in-depth development of Sino-Russian comprehensive strategic cooperative partnership in the modern economic pattern. Clarifying these characteristics and core status is of great significance for in-depth understanding of the current development situation of China-Russia border trade and exploring its transformation path in the future.

1.3 Trade volume, structure and regional distribution of China-Russia border trade in the transformation process

On the basis of clarifying the evolution course, current characteristics and core status of China-Russia border trade transformation, this section further focuses on the specific performance of China-Russia border trade in the transformation process, focusing on analyzing the changes of trade volume, the optimization of trade structure and the characteristics of regional distribution. Through the analysis of specific data and cases, this section clarifies the development law and existing problems of China-Russia border trade in the transformation process, and provides more detailed empirical support for the subsequent research on the transformation path. The analysis of trade volume, structure and regional distribution is not only the key part of the current situation research of China-Russia border trade, but also the important basis for judging the effect of border trade transformation and upgrading.

1 Changes in China-Russia border trade volume in the transformation process.

The change of trade volume is the most direct reflection of the development status and transformation effect of China-Russia border trade. Since 1992, with the phased evolution of China-Russia border trade, the trade volume has experienced a development process from small to large, from fluctuation to stability, and from scale expansion to quality improvement, which fully reflects the resilience and vitality of China-Russia border trade in the transformation process. Combined with the data of previous sections, this part focuses on sorting out the overall change trend of China-Russia border trade

volume, analyzing the influencing factors of trade volume changes in different transformation stages [11], and clarifying the development characteristics of trade volume in the high-quality transformation stage.

From the overall change trend, China-Russia border trade volume has shown a significant upward trend since 1992, with an average annual growth rate of 12.7 % from 1992 to 2023. In 1992, the initial stage of border trade recovery, the total trade volume was only 1.23 billion US dollars, which was in a low level of development. After entering the steady growth stage (2001–2008), the trade volume achieved rapid growth, with an average annual growth rate of 25.3 %, and the trade volume increased from 2.35 billion US dollars in 2001 to 11.87 billion US dollars in 2008, an increase of 5.05 times. During the accelerated development stage (2009–2018), affected by the global financial crisis, ruble depreciation and other factors, the growth rate of trade volume slowed down, but the overall trend was upward, with an average annual growth rate of 9.8 %, and the trade volume increased from 10.26 billion US dollars in 2009 to 24.58 billion US dollars in 2018, an increase of 2.39 times. Since entering the high-quality transformation stage (2019 – present), although affected by the COVID-19 epidemic and geopolitical factors, the trade volume has experienced short-term fluctuations, but it has quickly recovered and achieved steady growth. In 2023, the trade volume reached 27.89 billion US dollars, a new high, which was 22.5 times that of 1992, showing the strong resilience of China-Russia border trade in the transformation process.

To more intuitively demonstrate the overall trend of total Sino-Russian border trade volume from 1992 to 2023, the evolution of this volume over the past three decades is shown in Figure 13.

As can be seen from the chart, the overall trend of China-Russia border trade volume from 1992 to 2023 is upward, and it can be divided into four distinct stages according to the growth rate, which is consistent with the phased evolution of China-Russia border trade analyzed in Section 1.1. The growth rate in the steady growth stage (2001–2008) is the fastest, which is mainly due to the economic recovery of both countries, the optimization of policy environment and the expansion of trade scale.

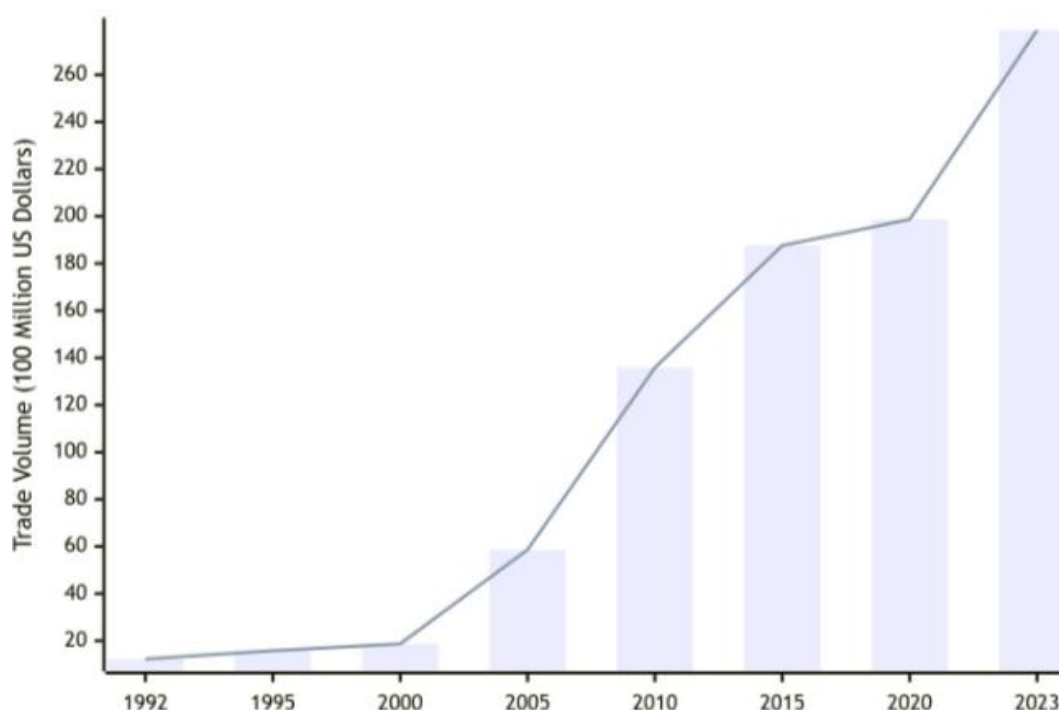


Figure 13 – The overall change trend of China-Russia border trade volume from 1992 to 2023 [11]

The growth rate in the accelerated development stage (2009–2018) slowed down, which is affected by the complex global economic environment and the adjustment of bilateral trade structure. The high-quality transformation stage (2019 – present) shows the characteristics of fluctuation-recovery-growth, which fully reflects the strong resilience of border trade under the impact of external factors.

In terms of the influencing factors of trade volume changes, different transformation stages have different core influencing factors. In the initial recovery stage (1992–2000), the trade volume is mainly affected by the economic system transformation of both countries and the policy support of border trade. The economic crisis in Russia and the backward economic development of China's border regions restrict the growth of trade volume, while the policy support of both countries promotes the initial recovery of border trade. In the steady growth stage (2001–2008), the core influencing factors are the economic recovery of both countries, the deepening of political mutual trust and the optimization of trade structure. The rapid economic growth of China and Russia has increased the demand for bilateral trade, and the standardized development of trade mode has promoted the expansion of trade scale. In the accelerated development stage (2009–

2018), the docking of the Belt and Road initiative and the Eurasian Economic Union, the improvement of cross-border infrastructure and the innovation of trade mode have become the core driving forces for the growth of trade volume, while the global economic downturn and ruble depreciation have brought certain negative impacts. In the high-quality transformation stage (2019 – present), the core influencing factors include the deepening of Sino-Russian strategic cooperation, the digital transformation of trade mode, the green transformation of trade structure, as well as the impact of the COVID-19 epidemic and geopolitical factors. Among them, the digital transformation and green transformation have provided new growth points for the trade volume, while the external negative factors have caused short-term fluctuations in the trade volume.

It is worth noting that in the high-quality transformation stage, the growth of China-Russia border trade volume has gradually shifted from scale-driven to quality-driven. The growth rate of trade volume has slowed down compared with the steady growth stage and the accelerated development stage, but the quality and efficiency of trade have been significantly improved. For example, in 2023, the trade volume increased by 8.6 % compared with 2022, while the added value of trade products increased by 15.3 %, which fully reflects the transformation of border trade from scale expansion to quality improvement. This change is not only in line with the development trend of the modern economy, but also the inevitable result of the high-quality transformation of China-Russia border trade.

2 Optimization of China-Russia border trade Sstructure in the transformation process.

The optimization of trade structure is the core content of the high-quality transformation of China-Russia border trade, and also an important symbol of the upgrading of border trade. In the process of phased evolution, China-Russia border trade has gradually got rid of the long-term pattern dominated by primary products and labor-intensive products, and the trade structure has been continuously optimized, showing the characteristics of high-quality, diversification and high-value-added. This part focuses on analyzing the optimization of import and export commodity structure, trade mode structure and trade subject structure in the transformation process, and clarifies the achievements

and existing problems of trade structure optimization.

First, the optimization of import and export commodity structure. The import and export commodity structure of China-Russia border trade has undergone a profound transformation from 1992 to the present. In the initial recovery stage (1992–2000), the commodity structure was single, mainly focusing on the exchange of primary products and labor-intensive products. China's exports were mainly light industrial products, textiles and clothing, food and daily necessities, while Russia's exports were mainly timber, coal, non-ferrous metals and other resource products. In 2000, the proportion of labor-intensive products in China's border trade exports accounted for 75 % of the total export volume, and the proportion of resource products in Russia's border trade exports accounted for 80 % of the total export volume.

With the entry into the steady growth stage (2001–2008), the import and export commodity structure began to optimize. China's exports gradually increased the proportion of mechanical and electrical products, and the export volume of mechanical and electrical products increased from 12 % in 2001 to 32 % in 2008. Russia's exports also began to increase the variety of resource products, and the export of processed resource products increased. In the accelerated development stage (2009–2018), the optimization of commodity structure was further accelerated. China's exports of high-tech products, processed agricultural products and other high-value-added products increased significantly. In 2018, the proportion of mechanical and electrical products in China's border trade exports reached 40.2 %, and the proportion of processed agricultural products reached 13.2 %. Russia's exports to China increased the proportion of high-quality agricultural products, chemical raw materials and mechanical and electrical parts. In 2018, the proportion of agricultural products in Russia's border trade exports reached 18.5 %, an increase of 12.3 percentage points compared with 2008.

In the high-quality transformation stage (2019 – present), the optimization of import and export commodity structure has entered a new stage. China's exports focus on high-tech products, intelligent equipment, green environmental protection products and other high-value-added products. In 2023, the export volume of high-tech products and mechanical and electrical products accounted for more than 56 % of the total export

volume, and the export volume of green products reached 3.25 billion US dollars, a year-on-year increase of 22.3 %. Russia's exports to China further increased the proportion of high-quality agricultural products, high-end chemical products and advanced technology. In 2023, the import volume of high-quality agricultural products from Russia reached 5.87 billion US dollars, accounting for 21.1 % of the total border trade import volume, and the import volume of high-end chemical products reached 2.35 billion US dollars, a year-on-year increase of 18.7 %. The optimization of import and export commodity structure has not only improved the quality and efficiency of China-Russia border trade, but also promoted the upgrading of the industrial structure of border regions of both countries.

The following chart shows the changes in the import and export commodity structure of China-Russia border trade from 2000 to 2023, which intuitively reflects the optimization process of the commodity structure (figure 14).

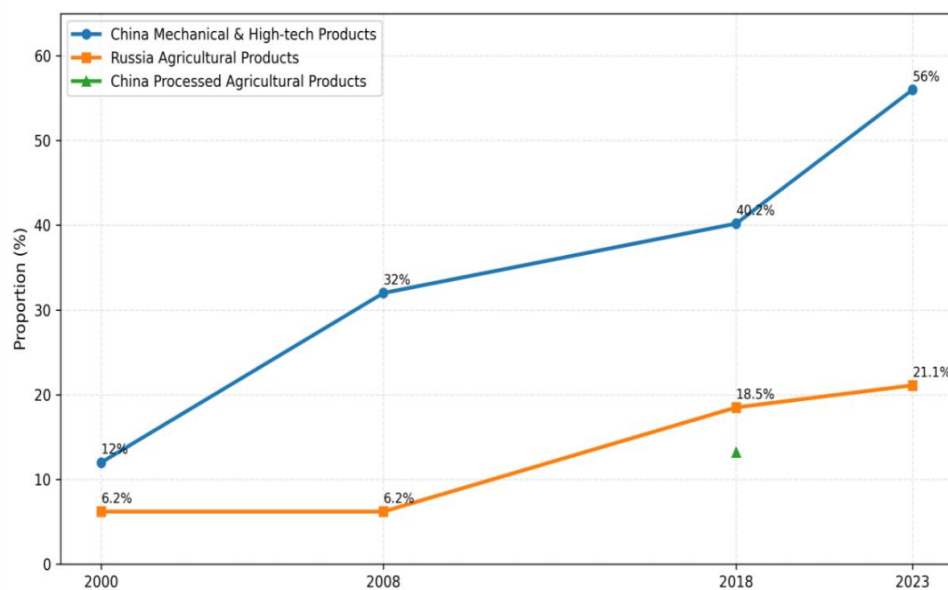


Figure 14 – The changes in the import and export commodity structure of China-Russia border trade from 2000 to 2023 [15]

As can be seen from the chart, the proportion of China's labor-intensive product exports has continued to decline from 2000 to 2023, while the proportion of high-value-added product exports has continued to rise; the proportion of Russia's resource product exports has continued to decline, while the proportion of high-quality agricultural product

exports has continued to rise. This change fully reflects the continuous optimization of the import and export commodity structure of China-Russia border trade in the transformation process.

Second, the optimization of trade mode structure. The trade mode structure of China-Russia border trade has also undergone significant changes in the transformation process, from the initial single barter trade and small-scale border trade to the diversified development of general trade, cross-border e-commerce, processing trade and other modes. In the initial recovery stage (1992–2000), barter trade and small-scale border trade were the main trade modes, accounting for more than 80 % of the total trade volume. Due to the shortage of foreign exchange in Russia at that time, barter trade became an important form of border trade, which solved the problem of insufficient foreign exchange in Russia and met the demand for primary products in China's border regions.

In the steady growth stage (2001–2008), the proportion of general trade in border trade increased significantly, while the proportion of barter trade and small-scale border trade decreased. In 2008, the proportion of general trade in border trade reached 63.8 %, an increase of 30 percentage points compared with 2001. The standardization of trade mode has improved the quality and efficiency of border trade. In the accelerated development stage (2009–2018), new trade formats such as cross-border e-commerce and processing trade developed rapidly, and the trade mode structure became more diversified. In 2018, the proportion of cross-border e-commerce trade in border trade reached 15.7 %, and the proportion of processing trade reached 12.3 %.

In the high-quality transformation stage (2019 – present), the trade mode structure has been further optimized, and digital trade and green trade have become new trade modes. Cross-border e-commerce has developed rapidly, and its proportion in border trade has increased from 15.7 % in 2018 to 28.3 % in 2023. Digital trade, cross-border live streaming, market procurement trade and other new formats have become important growth points of border trade. At the same time, the proportion of general trade has remained stable at about 65 %, and processing trade has continued to develop, forming a diversified trade mode structure dominated by general trade, supported by cross-border e-commerce and processing trade. The optimization of trade mode structure has not only

improved the efficiency of border trade, but also enhanced the anti-risk ability of border trade.

Third, the optimization of trade subject structure. The trade subject structure of China-Russia border trade has gradually diversified in the transformation process, from the initial dominance of small and medium-sized enterprises (SMEs) and individual households to the joint development of large enterprises, SMEs and foreign-invested enterprises, forming a multi-level and diversified trade subject pattern. In the initial recovery stage (1992–2000), due to the imperfect market system and the limited strength of enterprises, the main subjects of China-Russia border trade were individual households and small-scale SMEs, which were characterized by small scale, weak anti-risk ability and low degree of standardization. These subjects mainly engaged in small-scale commodity trade, and their ability to participate in international competition was limited.

With the entry into the steady growth stage (2001–2008), the trade subject structure began to optimize. Large-scale state-owned enterprises and private enterprises gradually participated in border trade, and their proportion in border trade continued to increase. These enterprises had stronger capital strength, better technological level and more standardized operation and management, which promoted the standardization and scaling of border trade. In 2008, the trade volume of large enterprises accounted for 45.2 % of the total border trade volume, an increase of 20 percentage points compared with 2001. At the same time, foreign-invested enterprises began to participate in China-Russia border trade, bringing advanced technology, management experience and market resources, and enriching the types of trade subjects.

In the accelerated development stage (2009–2018), the diversification of trade subjects was further promoted. With the optimization of the policy environment and the improvement of the market system, a large number of private enterprises, small and micro enterprises and cross-border e-commerce enterprises emerged, forming a pattern of coexistence and development of large, medium and small enterprises. Large enterprises mainly focused on bulk commodity trade, energy trade and major project cooperation, while SMEs and small and micro enterprises focused on characteristic products, consumer goods and cross-border e-commerce trade, forming a complementary development pattern.

In 2018, the trade volume of private enterprises accounted for 58.7 % of the total border trade volume, becoming the main force of China-Russia border trade. The proportion of foreign-invested enterprises also increased to 12.3 %, playing an important role in promoting technological exchange and market expansion.

In the high-quality transformation stage (2019 – present), the trade subject structure has been further optimized, and the quality and competitiveness of trade subjects have been significantly improved. On the one hand, large enterprises have further strengthened their leading role, increased investment in technology research and development and brand building, and expanded their influence in the Russian market. For example, a number of large Chinese enterprises such as Huawei, Haier and Sinopec have carried out in-depth cooperation in Russia through border trade, promoting the export of high-value-added products and technologies. On the other hand, SMEs and small and micro enterprises have accelerated their transformation and upgrading, relying on digital technology and cross-border e-commerce platforms to improve their market access capacity and anti-risk ability. In addition, the number of cross-border e-commerce enterprises has increased rapidly, and a number of specialized cross-border e-commerce platforms and service enterprises have emerged, providing comprehensive services such as logistics, customs clearance and payment for border trade enterprises. In 2023, the trade volume of private enterprises accounted for 65.8 % of the total border trade volume, and the proportion of high-tech enterprises participating in border trade increased to 18.7 %, showing the continuous optimization of the trade subject structure.

It should be noted that although the trade subject structure of China-Russia border trade has been continuously optimized, there are still some problems, such as the weak core competitiveness of some SMEs, the lack of brand awareness and the insufficient ability to resist market risks. These problems need to be solved in the process of further transformation and upgrading, so as to promote the high-quality development of China-Russia border trade.

Chapter 2 Driving forces, constraints and existing problems of border trade transformation

2.1 Internal and external driving forces of border trade transformation

The regional distribution of China-Russia border trade is closely related to the geographical location, industrial foundation and policy environment of border regions. In the process of transformation and upgrading, China-Russia border trade has formed a regional distribution pattern with obvious characteristics [34], which is mainly concentrated in four major border regions of China (Heilongjiang, Jilin, Inner Mongolia and Xinjiang) and the corresponding border regions of Russia (the Far East, Siberia and other regions). This part focuses on analyzing the regional distribution characteristics of China-Russia border trade, clarifying the development differences and complementary advantages of each border region, and exploring the reasons for the formation of the regional distribution pattern.

First, the overall regional distribution pattern: concentration in key border regions, forming a multi-polar development pattern. China-Russia border trade is mainly concentrated in four major border regions of China, namely Heilongjiang Province, Jilin Province, Inner Mongolia Autonomous Region and Xinjiang Uygur Autonomous Region. These four regions share a border line of more than 4,000 kilometers with Russia, accounting for more than 90 % of the total Sino-Russian border line, and have unique geographical advantages and industrial foundations. In 2023, the total trade volume of these four regions accounted for 98.7 % of the total China-Russia border trade volume, showing a high degree of concentration. At the same time, with the deepening of border trade transformation, each region has formed its own characteristic development direction according to its own advantages, forming a multi-polar development pattern with complementary advantages and coordinated development.

Second, the distribution characteristics of each border region: differentiated development based on comparative advantages. Each of the four major border regions has formed distinct development characteristics and trade focuses based on its own geographical location, industrial foundation and resource endowment, which together

constitute the regional distribution pattern of China-Russia border trade.

Heilongjiang Province is the core region of China-Russia border trade, with the longest border line with Russia (more than 2,981 kilometers) and the largest number of border ports (15 national first-class border ports). Relying on its geographical advantages and industrial foundation, Heilongjiang Province focuses on developing bulk commodity trade, cross-border logistics and deep processing trade, and is an important channel for China's exports to the Russian Far East and imports of Russian resource products. The main border ports in Heilongjiang include Suifenhe, Heihe, Manzhouli (co-administered with Inner Mongolia), Fuyuan and other ports. Among them, Suifenhe Port is the largest land port in Heilongjiang Province, mainly engaged in the trade of mechanical and electrical products, light industrial products and timber; Heihe Port, as a river-sea combined transport port, is an important channel for trade between China and the Russian Far East, focusing on the trade of agricultural products, energy products and consumer goods. In 2023, the border trade volume of Heilongjiang Province reached 11.23 billion US dollars, accounting for 40.3 % of the total China-Russia border trade volume, ranking first among the four major border regions. The key cooperation areas of Heilongjiang Province with Russia are the Russian Far East regions such as Amur Oblast, Jewish Autonomous Oblast and Primorsky Krai, focusing on cooperation in agriculture, energy, logistics and manufacturing.

Jilin Province, located in the northeast of China, shares a border line of more than 1,416 kilometers with Russia, with 4 national first-class border ports including Hunchun, Tumen and Longjing. Jilin Province focuses on the development of cross-border agricultural trade, border tourism and cross-border e-commerce, relying on its proximity to the Russian Far East agricultural producing areas and the geographical advantage of connecting China, Russia and the DPRK. Hunchun Port is the core port of Jilin Province, mainly engaged in the trade of agricultural products, aquatic products and light industrial products, and is an important channel for Russian agricultural products to enter China. In 2023, the border trade volume of Jilin Province reached 4.87 billion US dollars, accounting for 17.5 % of the total China-Russia border trade volume. The key cooperation areas of Jilin Province with Russia are Primorsky Krai and Khabarovsk Krai of the

Russian Far East, focusing on cooperation in agriculture, tourism, cross-border e-commerce and logistics. In recent years, Jilin Province has strengthened the construction of cross-border agricultural industrial chains, built a number of cross-border agricultural product processing bases and cold chain logistics facilities, and promoted the in-depth integration of agricultural trade and processing.

Inner Mongolia Autonomous Region shares a border line of more than 1,012 kilometers with Russia, with 3 national first-class border ports including Manzhouli, Erenhot and Altanbulag. Manzhouli Port, the largest land port in China, is located in Inner Mongolia Autonomous Region, which is an important channel for Russia's energy and mineral products to enter China. Inner Mongolia Autonomous Region focuses on the development of energy and mineral trade, cross-border service outsourcing and border tourism, relying on its adjacency to Russia's Siberian energy-rich regions. In 2023, the border trade volume of Inner Mongolia Autonomous Region reached 7.58 billion US dollars, accounting for 27.2 % of the total China-Russia border trade volume. The key cooperation areas of Inner Mongolia Autonomous Region with Russia are Siberian regions such as Buryatia, Zabaykalsky Krai and Irkutsk Oblast, focusing on cooperation in energy, minerals, service outsourcing and tourism. Manzhouli Port, as the core port of Inner Mongolia, accounts for more than 80 % of the region's border trade volume, mainly engaged in the trade of coal, oil, timber and mechanical and electrical products.

Xinjiang Uygur Autonomous Region shares a border line of more than 540 kilometers with Russia, with 2 national first-class border ports including Alashankou and Horgos. As an important gateway for China's westward opening, Xinjiang Uygur Autonomous Region focuses on the development of mechanical and electrical products export, energy transit and cross-border digital trade, relying on the China-Europe Railway Express and the West Land-Sea Corridor. Alashankou Port, an important node of the China-Europe Railway Express, is the core port of Xinjiang, mainly engaged in the trade of mechanical and electrical products, textiles and energy products, and is an important channel for China's products to be exported to Russia and Central Asia. In 2023, the border trade volume of Xinjiang Uygur Autonomous Region reached 4.21 billion US dollars, accounting for 15.1 % of the total China-Russia border trade volume. The key

cooperation areas of Xinjiang Uygur Autonomous Region with Russia are Siberian regions such as Altai Republic and Tyva Republic, focusing on cooperation in energy transit, mechanical and electrical products trade and digital trade.

The chart 15 shows the proportion of border trade volume of the four major border regions in China in 2023, which intuitively reflects the regional distribution characteristics of China-Russia border trade (figure 15).

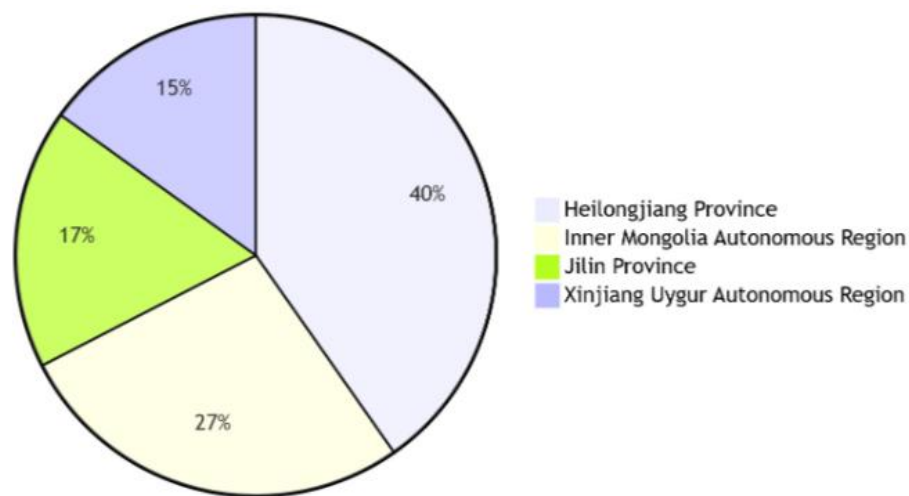


Figure 15 – The proportion of border trade volume of the four major border regions in China in 2023 [34]

As can be seen from the chart, Heilongjiang Province is the core region of China-Russia border trade, accounting for more than 40 % of the total border trade volume, followed by Inner Mongolia Autonomous Region, Jilin Province and Xinjiang Uygur Autonomous Region. This distribution pattern is closely related to the geographical location, industrial foundation and port conditions of each region, and also reflects the differentiated development characteristics of each region.

Third, the regional distribution characteristics of Russia's border trade. Corresponding to China's four major border regions, Russia's border trade with China is mainly concentrated in three major regions: the Far East Federal District, the Siberian Federal District and the North Caucasian Federal District, among which the Far East

Federal District and the Siberian Federal District are the core regions. The Far East Federal District, adjacent to China's Heilongjiang and Jilin provinces, is rich in agricultural resources, energy and mineral resources, and is the main region for Russia's exports of agricultural products, timber and mineral products to China. In 2023, the trade volume between the Far East Federal District and China's border regions accounted for 58.7 % of the total China-Russia border trade volume. The Siberian Federal District, adjacent to China's Inner Mongolia and Xinjiang regions, is rich in energy resources such as oil and gas, and is the main region for Russia's exports of energy products to China. In 2023, the trade volume between the Siberian Federal District and China's border regions accounted for 32.3 % of the total China-Russia border trade volume. The North Caucasian Federal District has a small trade volume with China's border regions, accounting for less than 10 % of the total border trade volume, mainly engaged in the trade of light industrial products and consumer goods.

Fourth, the reasons for the formation of the regional distribution pattern. The formation of the regional distribution pattern of China-Russia border trade is the result of the combined effect of geographical location, industrial foundation, policy environment and market demand. First, geographical location is the basic factor. The four major border regions of China are adjacent to Russia's resource-rich and market-potential regions, which have unique geographical advantages, reducing the transportation cost and transaction cost of border trade. Second, the industrial foundation is the key factor. Each border region has formed a characteristic industrial system according to its own resource endowment, which determines the trade focus and development direction of the region. For example, Heilongjiang Province has a strong logistics and manufacturing foundation, which is conducive to the development of bulk commodity trade and deep processing trade; Jilin Province has a good agricultural foundation, which is conducive to the development of cross-border agricultural trade. Third, the policy environment is the driving factor. The Chinese government has introduced a series of preferential policies for border regions, such as the construction of cross-border economic cooperation zones and cross-border e-commerce pilot zones, which have promoted the development of border trade in each region. Russia has also strengthened policy support for the Far East and

Siberian regions, attracting foreign investment and promoting economic and trade cooperation with China. Fourth, market demand is the guiding factor. The market demand of China and Russia's border regions determines the trade volume and trade structure of each region. For example, China's demand for energy and agricultural products promotes the development of energy and agricultural trade between China's border regions and Russia's Far East and Siberian regions; Russia's demand for mechanical and electrical products and consumer goods promotes the export of China's high-value-added products to Russia.

It is worth noting that although China-Russia border trade is highly concentrated in the four major border regions, there are still some problems in regional development, such as uneven development level between regions, imperfect cross-border infrastructure in some regions, and insufficient coordination between regions. These problems restrict the balanced development of China-Russia border trade and need to be solved in the process of further transformation and upgrading. For example, strengthening the coordination and cooperation between the four major border regions, promoting the sharing of resources and elements, and improving the cross-border infrastructure of underdeveloped border regions will help to optimize the regional distribution pattern of China-Russia border trade and promote the balanced and high-quality development of border trade.

To sum up, the regional distribution of China-Russia border trade in the transformation process is characterized by high concentration in key border regions and differentiated development based on comparative advantages. The four major border regions of China (Heilongjiang, Jilin, Inner Mongolia and Xinjiang) and the corresponding border regions of Russia (Far East, Siberia) form the core area of China-Russia border trade, and each region has formed its own characteristic development direction according to its own advantages. The formation of this regional distribution pattern is the result of the combined effect of geographical location, industrial foundation, policy environment and market demand. Clarifying the regional distribution characteristics of China-Russia border trade is of great significance for optimizing the regional layout of border trade, promoting the balanced development of border regions, and deepening the economic and trade cooperation between China and Russia.

The transformation of China-Russia border trade in the modern economic context is not an accidental phenomenon, but the result of the joint action of multiple internal and external driving forces. These driving forces interact, complement each other and jointly promote the border trade to get rid of the traditional extensive development mode, and move towards high-quality, diversified and sustainable transformation. Clarifying the internal and external driving forces is of great significance for grasping the law of border trade transformation, optimizing the development path and promoting the in-depth cooperation between China and Russia in border trade.

The internal driving forces of China-Russia border trade transformation mainly come from the economic and social development needs of the two countries and the inherent requirements of border trade itself [7], which are the core power to promote the transformation and upgrading of border trade. Firstly, the adjustment of industrial structure of the two countries provides a fundamental driving force. In recent years, China has been accelerating the optimization and upgrading of its industrial structure, vigorously developing high-tech industries, intelligent manufacturing and green industries, and the supply capacity of high-value-added products has been significantly improved, which has promoted the transformation of China's export commodities in border trade from labor-intensive products to high-tech, high-value-added products. Russia, on the other hand, has been promoting the diversification of its economy, reducing its dependence on resource exports, and continuously increasing the export proportion of high-quality agricultural products, processed resource products and advanced mechanical and electrical parts, which has also promoted the optimization of the import and export commodity structure of border trade.

Secondly, the continuous improvement of the infrastructure in the border regions of the two countries has laid a solid foundation for the transformation of border trade. With the advancement of the Belt and Road Initiative and the deepening of China-Russia regional cooperation, the construction of transportation, logistics, communication and other infrastructure in the border regions of the two countries has been accelerated. The upgrading and renovation of border ports, the construction of cross-border highways and railways, and the improvement of logistics and distribution systems have reduced the

transaction costs of border trade, improved the efficiency of goods circulation, and provided convenient conditions for the expansion of border trade scale and the innovation of trade modes. For example, the continuous improvement of the China-Europe Railway Express has shortened the transportation time between China and Russia, promoted the development of cross-border e-commerce and bulk commodity trade, and become an important internal driving force for the transformation of border trade.

Thirdly, the increasing demand of the domestic market of the two countries has injected new vitality into the transformation of border trade. With the continuous improvement of people's living standards in China, the demand for high-quality agricultural products, high-end chemical products and advanced technology from Russia is increasing, which has promoted the optimization of Russia's export structure in border trade. At the same time, the demand for high-tech products, intelligent equipment and green environmental protection products from China in Russia's market is also growing, which has promoted the upgrading of China's export products in border trade. The upgrading of market demand has promoted the two countries to adjust the commodity structure of border trade, and promoted the transformation of border trade from quantity expansion to quality improvement.

The external driving forces of China-Russia border trade transformation mainly come from the changes in the global economic environment [37], the deepening of international cooperation and the guidance of relevant policies, which provide a favorable external environment for the transformation of border trade. Firstly, the recovery of the global economy and the adjustment of the international trade pattern have created a favorable external environment. In the post-epidemic era, the global economy is gradually recovering, and the demand for international trade is increasing. At the same time, the multi-polarization of the international trade pattern is becoming increasingly obvious, and the cooperation between emerging economies is constantly deepening, which provides more opportunities for China-Russia border trade to expand its market space and optimize its trade structure.

Secondly, the deepening of China-Russia strategic cooperative partnership has provided a strong policy guarantee for the transformation of border trade. China and Russia have always maintained close high-level exchanges and cooperation, and have issued a series of policies and measures to promote border trade development, such as simplifying customs clearance procedures, reducing tariffs, and strengthening cross-border cooperation in finance and logistics. These policies have effectively promoted the liberalization and facilitation of border trade, reduced trade barriers, and promoted the transformation and upgrading of border trade. For example, the establishment of China-Russia border cooperation zones and cross-border economic cooperation zones has provided a platform for the aggregation of industries and the innovation of trade modes, and strongly promoted the transformation of border trade.

Thirdly, the development of new forms and models of international trade has brought new opportunities for the transformation of border trade. With the rapid development of digital economy, cross-border e-commerce, market procurement trade and other new trade forms and models have developed rapidly, which have broken the limitations of traditional border trade in time and space, reduced transaction costs, and expanded the market scope. China and Russia have actively promoted the development of cross-border e-commerce, built cross-border e-commerce platforms, and improved the supporting service system, which has promoted the transformation of border trade from traditional offline trade to online-offline integrated trade, and enriched the forms and connotations of border trade.

The charts intuitively reflect the core internal and external driving forces of China-Russia border trade transformation and their impact intensity, which can further clarify the role of various driving forces in the transformation process (figure 16).

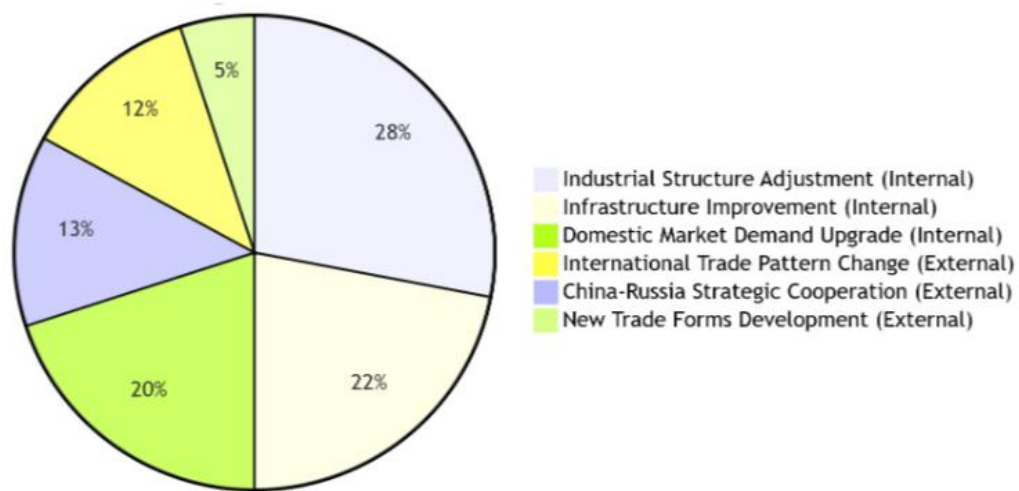


Figure 16 – The influence intensity of internal and external driving forces on the transformation of China-Russia border trade [7]

This chart uses a pie chart to show the impact intensity of various internal and external driving forces on the transformation of China-Russia border trade, intuitively reflecting the relative importance of each driving force.

2.2 Main constraints and bottlenecks in the transformation process

While China-Russia border trade is accelerating its transformation towards high quality under the joint action of various internal and external driving forces, it also faces many constraints and bottlenecks that cannot be ignored. These constraints come from the aspects of infrastructure, policy coordination [6], industrial foundation and market environment, which restrict the speed and quality of border trade transformation, and become the key factors that need to be solved in the process of in-depth development of China-Russia border trade.

Firstly, the unbalanced and inadequate infrastructure construction in border regions has become a prominent constraint. Although the infrastructure in China-Russia border regions has been continuously improved in recent years, there are still obvious deficiencies in overall coordination and supporting capacity. On the one hand, the infrastructure

construction between border ports is unbalanced. Some key ports have complete facilities, efficient customs clearance and smooth logistics, while some small and medium-sized border ports are backward in infrastructure, insufficient in loading and unloading capacity, and cumbersome in customs clearance procedures, which increases the transaction cost and time cost of border trade. On the other hand, the connection of cross-border infrastructure is not close enough. There are differences in the technical standards and construction levels of transportation, communication and logistics infrastructure between China and Russia, which leads to the disconnection of cross-border transportation links, low efficiency of goods circulation, and restricts the expansion of border trade scale and the innovation of trade modes. In addition, the supporting infrastructure such as cross-border finance and information services is relatively backward, which cannot meet the needs of the transformation and development of border trade.

Secondly, the insufficient coordination of policies and systems between the two countries has brought institutional constraints to the transformation of border trade. Although China and Russia have issued a series of policies to promote border trade development, there are still inconsistencies and incoordinations in policy implementation, institutional arrangements and regulatory standards between the two countries. For example, there are differences in customs clearance supervision systems, commodity inspection standards and tax policies between the two countries, which leads to cumbersome customs clearance procedures for cross-border goods, long inspection and quarantine time, and increases the operational risks and costs of enterprises. At the same time, the policy support for new trade forms such as cross-border e-commerce is not coordinated enough. The differences in policies such as cross-border payment, logistics distribution and return and exchange between the two countries restrict the development of new trade forms and hinder the transformation of border trade mode.

Thirdly, the weak industrial foundation of border regions and the low level of industrial collaboration restrict the transformation of border trade [21]. Most of the China-Russia border regions are located in remote areas, with relatively backward economic

development, weak industrial foundation, and lack of leading enterprises with strong competitiveness and industrial agglomeration capacity. The industrial structure of border regions is relatively single, mainly focusing on resource development and primary product processing, and the supply capacity of high-value-added products is insufficient, which cannot effectively meet the diversified market demand of the two countries. In addition, the industrial collaboration between China and Russia's border regions is not close enough, the industrial chain and supply chain are not perfect, and there is a lack of in-depth cooperation in R&D, production and sales, which makes it difficult to form a joint force to promote the transformation and upgrading of border trade.

Fourthly, the imperfect market environment and insufficient market vitality restrict the transformation of border trade. The market order of some border regions is not standardized, there are phenomena such as fake and shoddy goods, unfair competition, which damage the credibility of border trade and affect the willingness of enterprises to participate in border trade. At the same time, the market information is asymmetric. Enterprises on both sides of the border have insufficient understanding of each other's market demand, policy environment and industrial conditions, which leads to the mismatch between supply and demand of commodities, and affects the efficiency and quality of border trade. In addition, the financing difficulty of small and medium-sized enterprises engaged in border trade is prominent. The lack of effective financial support and credit guarantee makes it difficult for enterprises to expand production and operation, and restricts the innovation and development of enterprises in the process of border trade transformation.

The following chart intuitively reflects the intensity of various constraints and bottlenecks affecting the transformation of China-Russia border trade, which can clearly grasp the key constraints that need to be solved.

This chart uses a bar chart to show the intensity of various constraints on the transformation of China-Russia border trade, intuitively reflecting the relative importance of each constraint (figure 17).

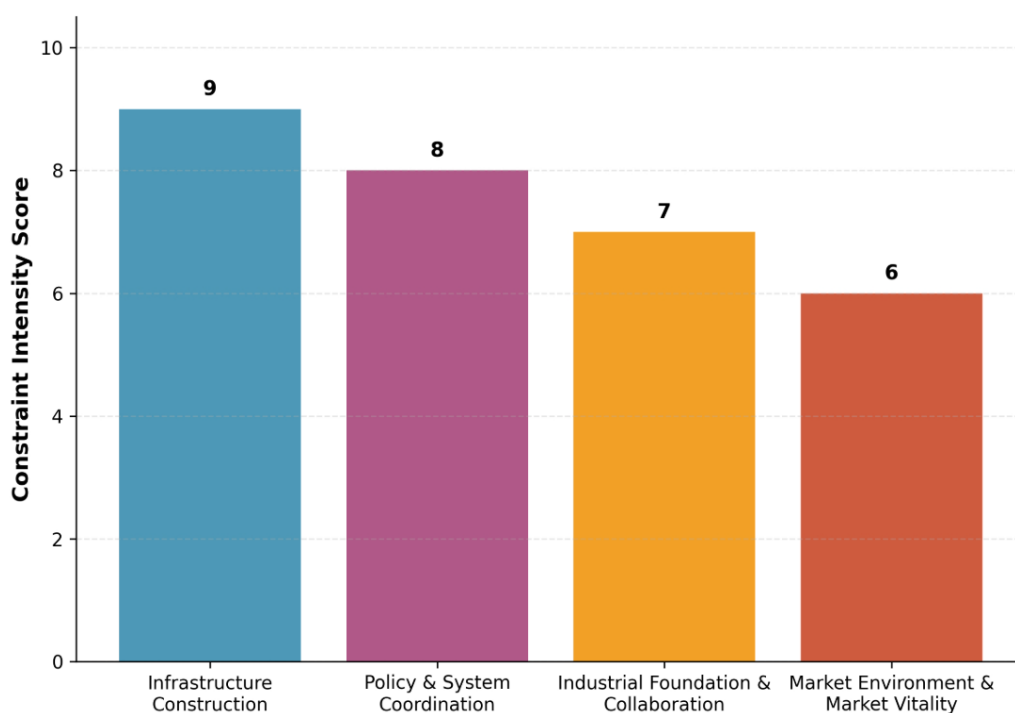


Figure 17 – Intensity of constraints on China-Russia border trade transformation [6]

Under the background of modern economic changes, such as the deepening of global economic integration, the rapid development of digital economy, and the adjustment of international trade pattern, China-Russia border trade transformation is facing new key problems and challenges. These problems are not only the extension of traditional constraints, but also new problems arising from the changes of the times, which require in-depth analysis and targeted solutions to promote the stable and healthy transformation of border trade.

Firstly, the impact of global economic volatility and geopolitical risks has become increasingly prominent [31]. In recent years, the global economy has been volatile, affected by factors such as regional conflicts, trade frictions and the COVID-19 epidemic, the stability of the international trade environment has been significantly reduced. China-Russia border trade is closely linked to the global economy, and the fluctuation of global commodity prices, the obstruction of cross-border transportation and the tightening of trade policies have brought great uncertainties to the transformation of border trade. At the same time, geopolitical risks in the border regions have increased, and the changes in the regional political environment have affected the stability of cross-border cooperation, restricted the expansion of border trade scale, and hindered the process of trade

transformation and upgrading.

Secondly, the digital transformation of border trade is lagging behind [35], and the integration of digital economy and border trade is not in place. Under the background of modern economic changes, digital economy has become an important driving force for the transformation and development of international trade. However, the digital transformation of China-Russia border trade is still in the initial stage, and there are many problems such as insufficient digital infrastructure, low level of digitalization of enterprises, and imperfect digital service system. Most of the traditional border trade enterprises lack the ability of digital transformation, and still rely on the traditional offline trade mode, which cannot adapt to the development trend of digital international trade. In addition, the construction of cross-border digital platforms is not perfect, the sharing of digital information between the two countries is insufficient, and the efficiency of cross-border trade is affected, which restricts the transformation of border trade towards digitalization and intelligence.

Thirdly, the environmental protection pressure is increasing, and the green transformation of border trade is urgent. With the global emphasis on environmental protection and the continuous improvement of environmental protection standards of various countries, the green transformation of international trade has become an inevitable trend. China-Russia border trade has long been dominated by resource products and primary products, and the development mode is relatively extensive, which has brought certain pressure to the ecological environment of border regions. Under the background of modern economic changes, the environmental protection requirements of the two countries are constantly improving, and the pressure of ecological environmental protection on border trade is increasing. How to realize the green transformation of border trade, balance the relationship between trade development and environmental protection, and promote the sustainable development of border trade has become a key problem faced by the transformation of China-Russia border trade.

Fourthly, the quality of talents in border trade is not high, and the shortage of professional talents restricts the transformation of border trade. The transformation of China-Russia border trade towards high quality, digitalization and greenization requires a

large number of professional talents who are familiar with international trade rules, master cross-border e-commerce, foreign languages, law and other related knowledge. However, due to the relatively backward economic development of border regions, the attractiveness of talents is insufficient, resulting in a serious shortage of professional talents in border trade. The existing talents have low professional quality and single knowledge structure, which cannot meet the needs of border trade transformation and development. The shortage of professional talents has become a key factor restricting the innovation of border trade mode, the optimization of trade structure and the improvement of trade efficiency.

The following charts intuitively reflect the key problems faced by China-Russia border trade transformation under modern economic changes and their impact degree, providing a basis for solving related problems. This chart uses a pie chart to show the impact degree of various key problems on the transformation of China-Russia border trade, clearly reflecting the priority of solving each problem (figure 18).

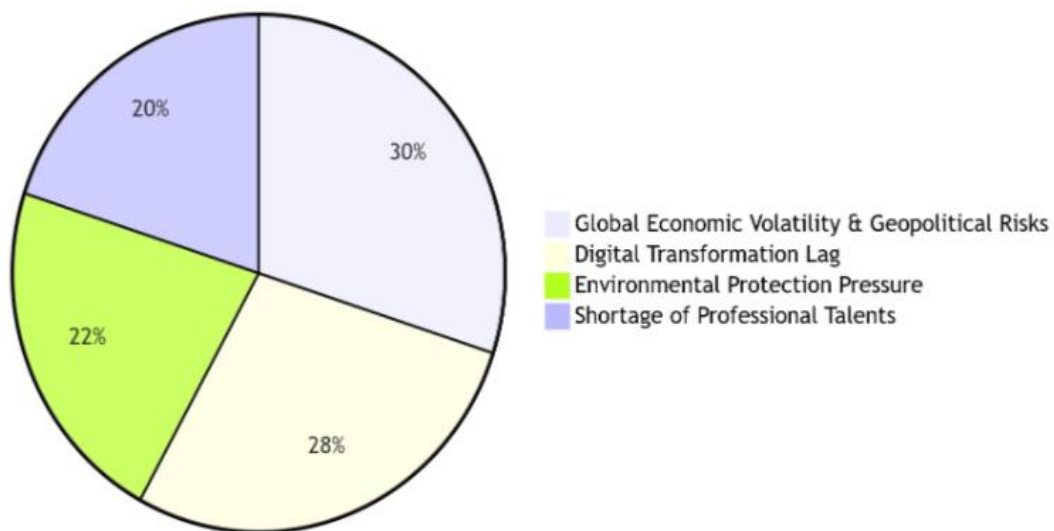


Figure 18 – Impact degree of key problems faced by border trade transformation [31]

This figure 19 uses a line chart to show the change trend of the impact degree of key problems from 2020 to 2023, reflecting the changing characteristics of various problems in the process of modern economic changes.

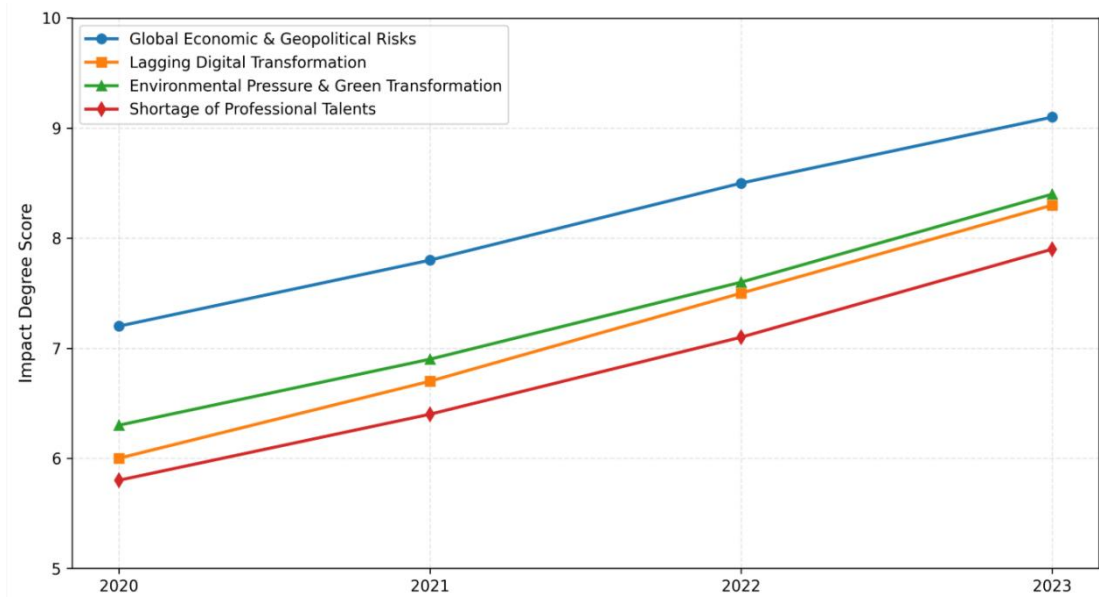


Figure 19 – Change trend of impact degree of key problems (2020–2023) [35]

The impact degree of key impediments in Sino-Russian border trade has undergone a notable structural evolution, marked by a progressive reordering of their relative significance. Traditional logistical bottlenecks, including inadequate cross-border infrastructure and protracted customs procedures, have gradually lost their dominant position as primary constraints on trade flows, thanks to sustained bilateral investment in transport corridors and the digital streamlining of clearance processes. In their place, a new set of non-traditional frictions has risen to the forefront: disruptions to payment settlement channels driven by the steady tightening of financial sanctions, coupled with heightened exchange rate volatility, now constitute the most acute and persistent challenges. The temporary shock of pandemic-era border closures momentarily reconfigured the hierarchy of problems, yet its longer-term imprint has been decisively eclipsed by the mounting weight of geopolitical risk and financial compliance uncertainties, which have solidified their role as the principal drivers of instability in the bilateral trade environment.

Chapter 3 Paths, policy support and future prospects of China-Russia border trade transformation

3.1 Practical paths for transformation and upgrading of border trade

In response to the constraints, bottlenecks and key problems faced by China-Russia border trade transformation in the modern economic context, it is necessary to explore practical and feasible transformation and upgrading paths based on the actual situation of border trade development and the strategic needs of China-Russia cooperation. These paths should focus on solving core problems such as unbalanced infrastructure, insufficient policy coordination, lagging digital transformation and weak industrial foundation, and promote the high-quality transformation of China-Russia border trade in an all-round way through multi-dimensional and systematic promotion.

The first practical path is to optimize the layout of border infrastructure and strengthen cross-border infrastructure connectivity [53]. Infrastructure is the foundation for the transformation and upgrading of border trade. It is necessary to focus on solving the problems of unbalanced infrastructure construction and inadequate cross-border connection. On the one hand, we should increase investment in infrastructure construction of small and medium-sized border ports, upgrade loading and unloading equipment, improve customs clearance sites and supporting facilities, simplify customs clearance procedures, and improve the efficiency of port operation. On the other hand, we should strengthen the coordination and cooperation between China and Russia in infrastructure construction, align technical standards and construction levels of cross-border transportation, communication and logistics infrastructure, promote the connection of cross-border highways, railways and other transportation links, and build a smooth cross-border logistics network. In addition, we should accelerate the construction of supporting infrastructure such as cross-border finance and information services, improve the cross-border payment and settlement system, and build a cross-border information sharing platform to provide comprehensive support for the transformation of border trade.

The second practical path is to deepen policy coordination between the two countries and optimize the institutional environment for border trade [63]. A sound

institutional environment and coordinated policy support are important guarantees for the transformation of border trade. China and Russia should further strengthen high-level exchanges and consultations, improve the policy coordination mechanism, and align customs clearance supervision, commodity inspection standards, tax policies and other related systems to reduce trade barriers and improve the liberalization and facilitation level of border trade. We should focus on strengthening policy support for new trade forms such as cross-border e-commerce, formulating coordinated policies on cross-border payment, logistics distribution, return and exchange, and create a favorable policy environment for the development of new trade forms. At the same time, we should strengthen the construction of border cooperation zones and cross-border economic cooperation zones, improve the policy support system of the zones, and give play to the role of the zones as a platform for industrial agglomeration and trade innovation, so as to drive the transformation and upgrading of border trade.

The third practical path is to strengthen the construction of industrial foundation in border regions and promote in-depth industrial collaboration between the two countries [36]. The improvement of industrial foundation and the deepening of industrial collaboration are the core driving forces for the transformation of border trade. We should increase policy support for the economic development of border regions, guide enterprises to increase investment in R&D and innovation, cultivate leading enterprises with strong competitiveness, and promote the optimization and upgrading of the industrial structure of border regions. We should focus on developing high-value-added industries such as high-tech products, processed agricultural products and green environmental protection products, and improve the supply capacity of high-value-added products in border trade. At the same time, we should strengthen industrial collaboration between China and Russia's border regions, build a perfect cross-border industrial chain and supply chain, promote in-depth cooperation in R&D, production and sales between enterprises of the two countries, and form a joint force to promote the transformation and upgrading of border trade.

The fourth practical path is to accelerate the digital transformation of border trade and promote the integration of digital economy and border trade [43]. Digital

transformation is an important direction for the transformation of border trade in the modern economic context. We should accelerate the construction of digital infrastructure in border regions, improve the coverage and speed of digital networks, and lay a solid foundation for the digital transformation of border trade. We should guide traditional border trade enterprises to carry out digital transformation, popularize digital technologies such as big data, artificial intelligence and block chain in trade links, and improve the digitalization level of enterprise operation and management. We should strengthen the construction of cross-border digital trade platforms, improve the supporting service system of digital trade, promote the development of cross-border e-commerce, digital services and other new trade forms, and promote the transformation of border trade towards digitalization and intelligence.

The fifth practical path is to promote the green transformation of border trade and realize the sustainable development of border trade [54]. Facing the increasing pressure of environmental protection, green transformation has become an inevitable requirement for the transformation of border trade. We should strengthen the concept of green development, formulate green trade standards, and guide enterprises to carry out green production and green trade. We should optimize the import and export commodity structure, reduce the proportion of high-pollution and high-energy-consuming products, and increase the export of green environmental protection products and low-carbon products. We should strengthen environmental protection cooperation between China and Russia, establish a cross-border environmental protection supervision mechanism, and balance the relationship between trade development and environmental protection, so as to promote the sustainable development of border trade.

The following charts intuitively reflect the importance and implementation effect expectation of each practical path for the transformation and upgrading of China-Russia border trade, providing a reference for the implementation of the paths (figure 20).

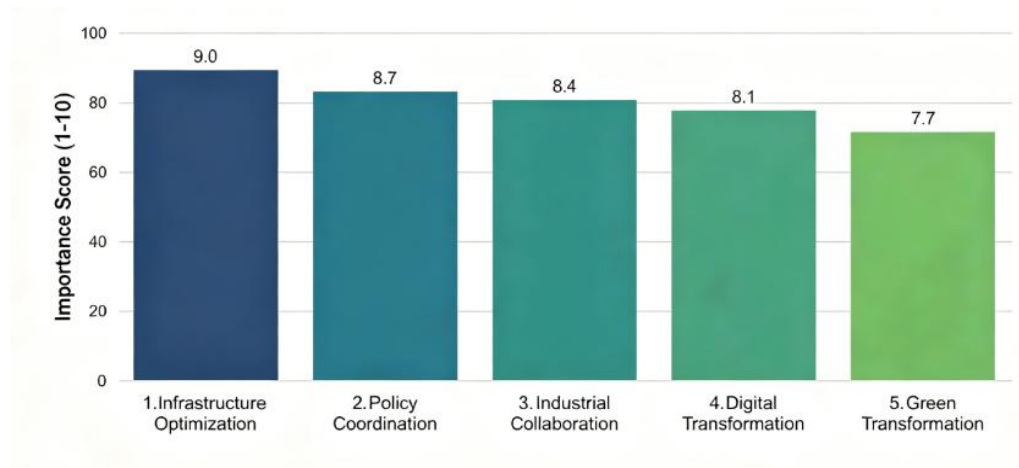


Figure 20 – Importance of practical paths for border trade transformation and upgrading [53]

This chart uses a bar chart to show the importance of each practical path, intuitively reflecting the priority of each path in the process of transformation and upgrading.

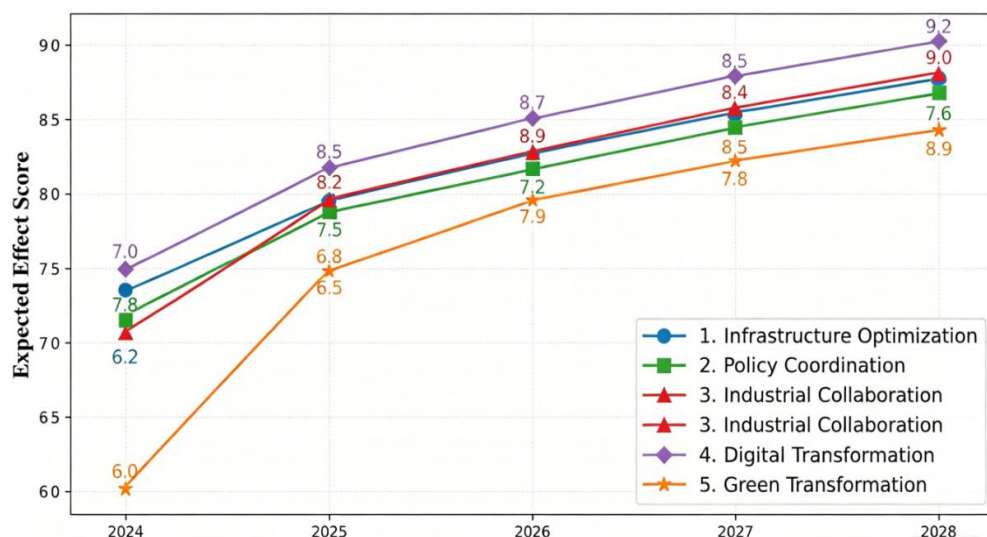


Figure 21 – Expected Implementation Effect of Practical Paths (2024–2028) [63]

This chart uses a line chart to show the expected implementation effect of each practical path from 2024 to 2028, reflecting the expected promotion effect of each path on border trade transformation (figure 21).

Policy innovation and improved supporting mechanisms are the key guarantees to promote the smooth transformation and upgrading of China-Russia border trade. Against the background of modern economic changes, the traditional policy system and supporting mechanisms can no longer fully meet the needs of border trade transformation, and it is

urgent to carry out targeted policy innovation and improve the supporting mechanism system to provide strong support for the high-quality development of border trade. The policy innovation and supporting mechanisms should be closely combined with the practical paths of border trade transformation, focus on solving the core constraints and key problems faced by the transformation, and form a policy system and mechanism guarantee that are scientific, targeted and operable.

3.2 Future development trends and prospects of border trade transformation

In terms of policy innovation, first of all, it is necessary to innovate cross-border trade facilitation policies [12]. On the basis of existing policies, China and Russia should further simplify customs clearance procedures, promote the mutual recognition of customs clearance documents and the integration of inspection and quarantine standards, and realize one-stop customs clearance and green channel for key commodities. We should actively promote the digitalization of customs clearance, popularize electronic customs declaration, electronic inspection and electronic payment, and improve the efficiency of customs clearance. At the same time, we should adjust and optimize tax policies, appropriately reduce tariffs on high-value-added products, green products and new trade form commodities, and reduce the cost of enterprise operation. For small and medium-sized enterprises engaged in border trade, we should introduce preferential tax policies such as tax reduction and exemption to enhance their vitality and competitiveness.

Secondly, we should innovate policies to support new trade forms and models. In response to the rapid development of digital economy, we should formulate special support policies for cross-border e-commerce, digital trade and other new trade forms, improve the cross-border payment and settlement system, optimize the logistics distribution and return and exchange mechanisms, and create a favorable policy environment for the development of new trade forms. We should strengthen the construction of cross-border e-commerce comprehensive pilot zones and digital trade pilot zones, give play to the demonstration and leading role of the pilot zones, and promote the

innovative development of new trade forms. In addition, we should support the development of cross-border service trade, expand the scope of service trade cooperation, and promote the transformation of border trade from goods trade to goods trade and service trade coordinated development.

Thirdly, we should innovate industrial support policies. We should focus on strengthening policy support for the industrial development of border regions, increase investment in R&D and innovation, and support the development of high-value-added industries such as high-tech, green environmental protection and deep processing of agricultural products. We should formulate policies to encourage enterprise cooperation, guide enterprises of the two countries to carry out in-depth cooperation in R&D, production and sales, and promote the integration of cross-border industrial chains and supply chains. For leading enterprises and innovative enterprises in border trade, we should give policy preferences such as financial subsidies and credit support to play their leading role in driving the transformation and upgrading of border trade.

In terms of supporting mechanisms, it is necessary to improve the policy coordination mechanism between China and Russia. We should establish a regular consultation mechanism between the two countries, strengthen communication and coordination in policy formulation, implementation and supervision, and resolve policy inconsistencies and incoordinations in a timely manner. We should strengthen the construction of cross-border cooperation platforms, such as border cooperation zones and cross-border economic cooperation zones, and improve the operation and management mechanism of the platforms to provide a carrier for policy implementation and enterprise cooperation. At the same time, we should improve the market supervision mechanism, standardize the market order of border trade, crack down on fake and shoddy goods and unfair competition, and protect the legitimate rights and interests of enterprises and consumers.

In addition, we should improve the financial support mechanism and talent support mechanism [10]. We should strengthen the support of financial institutions for border trade, expand the coverage of credit support, improve the credit guarantee system for small and medium-sized enterprises, and solve the problem of financing difficulty and expensive

financing for enterprises. We should establish a cross-border talent training and introduction mechanism, strengthen the training of professional talents in border trade, digital trade, foreign languages and law, and introduce high-end talents to provide intellectual support for the transformation of border trade. We should also improve the information sharing mechanism, build a cross-border information sharing platform, and provide enterprises with timely and accurate information on market demand, policy environment and industrial trends.

The following chart intuitively reflects the effectiveness of various policy innovations and supporting mechanisms in promoting border trade transformation, providing a reference for policy formulation and mechanism improvement. The chart 22 uses a bar chart to show the effectiveness of various policy innovations and supporting mechanisms in promoting border trade transformation, intuitively reflecting the role of each policy and mechanism.

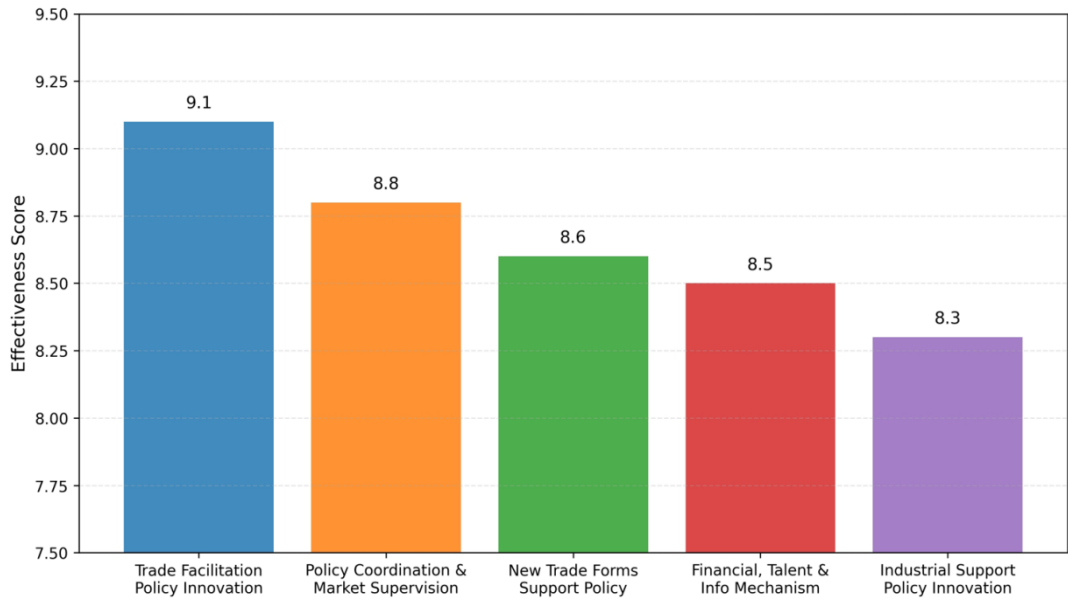


Figure 22 – Effectiveness of policy innovation and supporting mechanisms [12]

Against the background of deepening global economic integration, rapid development of digital economy and in-depth advancement of China-Russia strategic cooperative partnership, the transformation of China-Russia border trade will show new development trends and broad prospects. With the continuous implementation of practical

paths, policy innovation and improvement of supporting mechanisms, China-Russia border trade will gradually get rid of the traditional extensive development mode, and move towards a high-quality development track of diversification, digitalization, greenization and integration, which will play a more important role in promoting the economic and social development of border regions of the two countries and deepening China-Russia economic and trade cooperation.

The first major development trend is the continuous optimization of the trade structure and the continuous improvement of the quality of trade development. In the future, with the deepening of industrial collaboration between China and Russia and the continuous advancement of industrial upgrading, the import and export commodity structure of China-Russia border trade will be further optimized. The proportion of high-value-added products, green products and high-tech products in border trade will continue to increase, while the proportion of primary products and labor-intensive products will gradually decrease. Border trade will shift from quantity expansion to quality improvement, and the added value of trade will be significantly improved. At the same time, the form of border trade will be more diversified, and the coordinated development of goods trade, service trade and digital trade will become the main trend.

The second major development trend is the in-depth integration of digital economy and border trade, and the accelerated digital transformation of border trade. With the continuous improvement of digital infrastructure in border regions and the continuous popularization of digital technologies, digital trade will become an important growth point of China-Russia border trade. Cross-border e-commerce, digital services, online exhibitions and other new trade forms will develop rapidly, breaking the limitations of time and space in traditional border trade and improving the efficiency and convenience of border trade. Enterprises will further accelerate digital transformation, and digital technologies such as big data, artificial intelligence and block chain will be widely used in trade links such as procurement, production, sales and logistics, promoting the intelligence and digitalization of border trade operation and management.

The third major development trend is the continuous strengthening of green trade and the accelerated advancement of green transformation [68]. Facing the global emphasis

on environmental protection and the increasing environmental protection pressure of the two countries, green trade will become an important direction for the transformation of China-Russia border trade. The two countries will further strengthen environmental protection cooperation, formulate more strict green trade standards, and promote the development of green production and green trade. The export of green environmental protection products, low-carbon products and recycled products will increase significantly, and the concept of green development will be deeply rooted in the field of border trade. The balanced development of trade and environmental protection will be realized, and the sustainable development level of border trade will be continuously improved.

The fourth major development trend is the continuous deepening of cross-border cooperation and the formation of a more close cross-border industrial chain and supply chain. In the future, China and Russia will further strengthen cooperation in border trade, deepen the integration of cross-border industrial chains and supply chains, and form a win-win cooperation pattern. Border cooperation zones and cross-border economic cooperation zones will play a more important role as a platform, attracting more enterprises to gather, promoting the in-depth cooperation between enterprises of the two countries in R&D, production and sales, and improving the stability and competitiveness of the cross-border industrial chain and supply chain. At the same time, the cooperation in cross-border logistics, finance, information and other fields will be further strengthened, forming a comprehensive service system to support the development of border trade.

In terms of development prospects, China-Russia border trade will have broad development space and huge growth potential. With the continuous advancement of the Belt and Road Initiative and the deepening of China-Russia strategic cooperative partnership, the policy environment for border trade will be further optimized, and the infrastructure connectivity will be further improved, providing a favorable foundation for the development of border trade. The continuous growth of market demand of the two countries and the continuous improvement of industrial strength will provide strong driving force for the transformation and development of border trade. It is expected that in the next five years, China-Russia border trade volume will maintain a steady growth trend, the trade structure will be further optimized, and the level of high-quality development

will be continuously improved, making greater contributions to the deepening of China-Russia economic and trade cooperation and the common development of the two countries.

The following charts intuitively reflect the future development trends and growth prospects of China-Russia border trade transformation, providing a reference for grasping the development direction of border trade (figure 23).

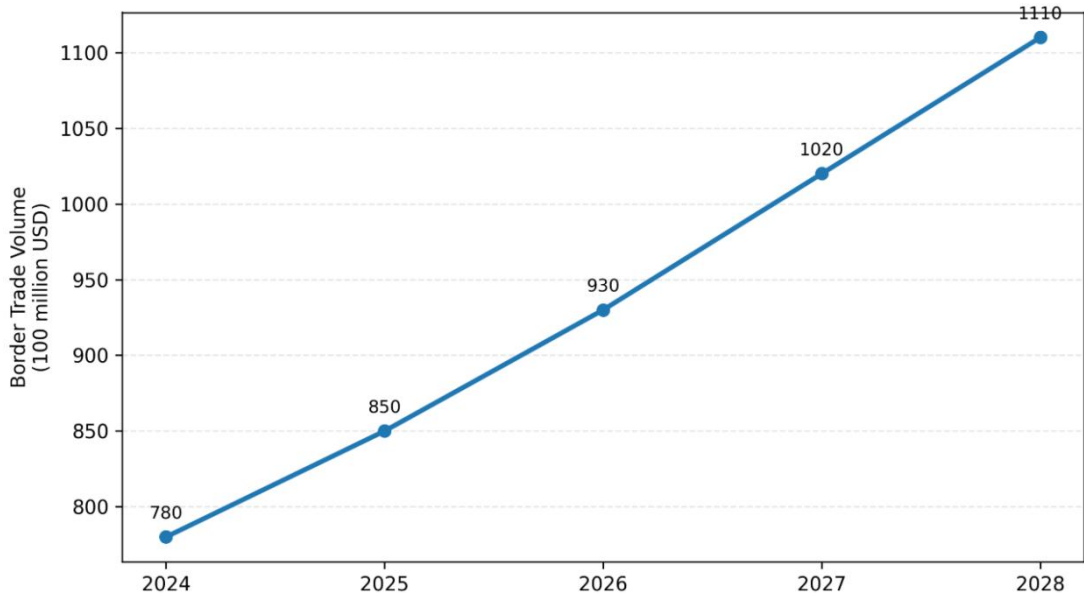


Figure 23 – Growth trend of China-Russia border trade volume (2024–2028) [68]

This chart uses a line chart to show the expected growth trend of China-Russia border trade volume from 2024 to 2028, reflecting the broad development prospects of border trade (figure 24).

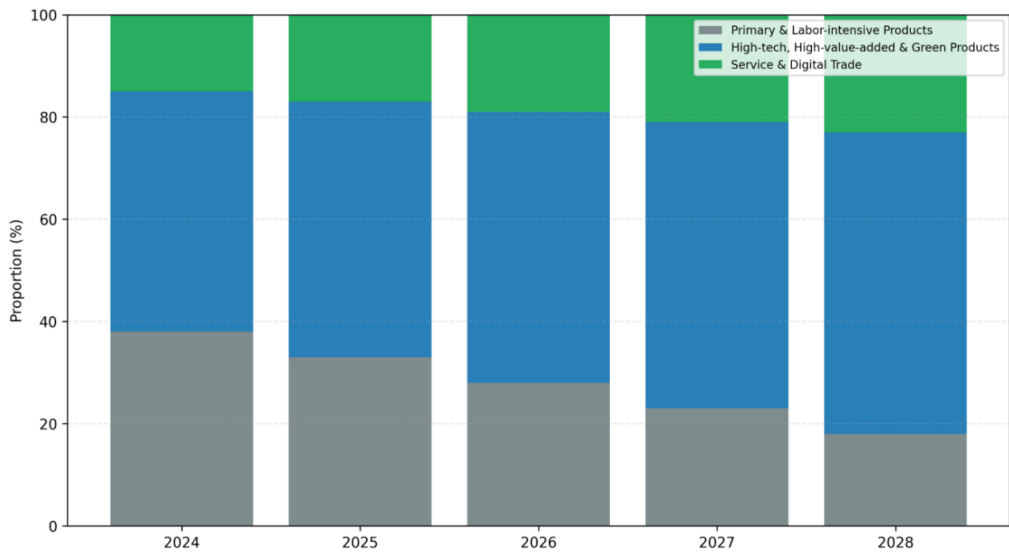


Figure 24 – Proportion change trend of key trade types (2024–2028) [15]

This chart uses a stacked bar chart to show the expected proportion change trend of key trade types in China-Russia border trade from 2024 to 2028, reflecting the optimization trend of trade structure.

Conclusion

This thesis focuses on the transformation of China-Russia border trade in the context of the modern economy, systematically exploring the driving forces, constraints, practical paths, policy support, and future prospects of border trade transformation. Through in-depth analysis and research, this chapter summarizes the core findings of the full text, clarifies the key conclusions of China-Russia border trade transformation, and puts forward relevant implications for promoting the high-quality development of China-Russia border trade, so as to provide theoretical and practical reference for deepening China-Russia economic and trade cooperation and promoting the sustainable development of border regions of both countries.

Firstly, the transformation of China-Russia border trade in the modern economy is driven by the joint action of internal and external factors. Internally, the adjustment of industrial structure, the improvement of infrastructure and the upgrading of domestic market demand have provided strong internal driving forces for the transformation of border trade, showing a continuous upward trend in the driving effect. Externally, the deepening of China-Russia strategic cooperative partnership, the advancement of global economic integration and the development of digital economy have created favorable external conditions for border trade transformation. However, it should be noted that the transformation process is also facing many constraints and bottlenecks, including unbalanced infrastructure construction, insufficient policy coordination between the two countries, weak industrial foundation in border regions and imperfect market environment, among which the unbalanced infrastructure is the most prominent constraint.

Secondly, the practical paths for the transformation and upgrading of China-Russia border trade are multi-dimensional and systematic. To promote the smooth transformation of border trade, it is necessary to focus on optimizing border infrastructure layout, deepening policy coordination between the two countries, strengthening industrial foundation construction and industrial collaboration, accelerating digital transformation and promoting green transformation. Among these paths, infrastructure optimization and policy coordination deepening are the most important, which are the key to breaking

through the constraints of border trade transformation. The implementation of these paths is expected to show a steady upward trend in the next five years, and will effectively promote the high-quality transformation of border trade.

Thirdly, policy innovation and improved supporting mechanisms are important guarantees for border trade transformation. In terms of policy innovation, it is necessary to focus on innovating cross-border trade facilitation policies, new trade form support policies and industrial support policies to reduce trade costs and enhance the vitality of enterprises. In terms of supporting mechanisms, it is necessary to improve the policy coordination mechanism, market supervision mechanism, financial support mechanism, talent support mechanism and information sharing mechanism between China and Russia, forming a comprehensive support system to ensure the smooth progress of border trade transformation. These policy innovations and supporting mechanisms will effectively alleviate the constraints faced by border trade transformation and provide a strong guarantee for the high-quality development of border trade.

Fourthly, the transformation of China-Russia border trade in the modern economy shows distinct development trends and broad prospects. In the future, with the continuous implementation of practical transformation paths and the continuous improvement of policy support and supporting mechanisms, China-Russia border trade will gradually get rid of the traditional extensive development mode, and move towards a high-quality development track characterized by diversification, digitalization, greenization and integration. The trade structure will be further optimized, the proportion of high-value-added products and green products will continue to increase, the digital transformation will be further deepened, and cross-border industrial collaboration will be more in-depth. It is expected that the volume of China-Russia border trade will maintain a steady growth trend in the next five years, and border trade will play a more important role in deepening China-Russia economic and trade cooperation, promoting the economic development of border regions of both countries and maintaining regional peace and stability.

In conclusion, the transformation of China-Russia border trade in the modern economy is an inevitable trend under the joint action of internal and external driving forces, and also a necessary requirement for adapting to the changes of the global

economic pattern and the strategic needs of China-Russia cooperation. Although there are still many constraints and challenges in the transformation process, with the deepening of China-Russia strategic mutual trust, the continuous optimization of the policy environment and the joint efforts of enterprises and governments of both countries, the high-quality transformation of China-Russia border trade will surely achieve greater progress, making greater contributions to the deepening of the comprehensive strategic cooperative partnership between China and Russia and the common development of the two countries.

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