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Towards a Sustainable Future: The Emerging Role and Far-Reaching Impact of Green Finance Instruments in Russia-China Trade Relations

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ABSTRACT

In today's context of globalization, the trade relationship between China and Russia has become increasingly close, and with the rising global concern for environmental sustainability, green finance, as an emerging financial model, is gradually becoming an important factor in Russia-China trade cooperation. This article explores the role and impact of green financial instruments in trade relations between China and Russia. It empirically analyses the relationship between the volume of exports to Russia from 22 Chinese provinces and variables such as the level of development of green financial instruments (green insurance, green credit, green bonds, green funds), GDP and population in each province. The results show that green credit, bonds and funds have no significant impact on export volume, while green insurance has a damping effect on export growth. China and Russia need to deepen cooperation in green finance, optimise green insurance policy formulation, reduce the burden on enterprises, and strengthen the market promotion and innovation of green financial instruments. It is recommended that both governments strengthen policy coordination, provide tax incentives and financial support, and promote the green transformation of trade structures to achieve synergistic development of the economy and the environment.

Keywords: green finance; China-Russia trade; sustainable development; green insurance; green credit; green bonds; green funds; empirical analysis; trade structure optimisation; economic cooperation

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INTRODUCTION

Current status of trade development between China and Russia

The relevance of the study is due to the growing role of Russia and China in international relations. The importance of economic and trade connections between China and Russia as neighboring countries is self-evident. Countries' trade and investment cooperation is not only deepening, but also injecting a constant impetus into their economic future. This is not only due to the growing status of the two countries in international relations, but also because the cooperation between them is based on a deep geographical, historical and cultural background. Since the signing of the Treaty on Good-Neighborly Relations, Friendship and Cooperation between China and Russia in 16.07.2001, China-Russia relations have skyrocketed and consolidated, becoming one of the most dynamic and promising bilateral liaisons in the world. Russia-China logist Yu. V. Tavrovsky writes: "The geopolitical future of Russia is connected with China as closely as the past. Over the course of 400 years of neighborhood and interaction between two countries-civilizations, they have clashed more than once, but never really fought in a large-scale military confrontation. Allied relations were maintained and fixed by secret and open treaties in 1896, 1937, 1945 and 1950. During the Second World War, China and Russia took turns becoming each other's "second front," drawing off the forces of the common enemy [1]. This interaction was based on national interests and commonality, the interpenetration of the two countries' value codes, which ultimately predetermines their trade, economic, financial, insurance, and technical and technological cooperation, which has sharply

increased in recent years. Obviously, there are reasons for such relationships that exceed situational political interests. Russia and China belong to large cultural and civilizational systems, each of which has formed a civilizational model of its own, among the advantages of which is a multi-thousand-year history, impossible without a strategic understanding of the value of national unity, coherence, and consolidation. Increasing anxiety in relation to the planetary future dictates the need to understand the mechanisms of self-determination of peoples united by enormous civilizational centers of rising countries-giants.

China and Russia share a long common border,[1] which provides unique conditions for economic and trade cooperation between the two parties. This geographical proximity gives the two countries significant advantages in trade and logistics, reducing transport costs and time and improving the efficiency of cooperation. China and Russia have a long history of interaction, and this historical origin has laid a solid foundation for the development of economic and trade relations between the two sides. Since the Soviet period, China and Russia have established close economic and trade ties, which have continued to develop and grow in the following decades. Even after the collapse of the Soviet Union, China and Russia have continued to maintain and promote good, far-reaching bilateral economic, investment and trade cooperation momentum that has enabled both countries to have a better understanding of each other's needs and future interests. Although China and Russia have different cultural backgrounds, they both have a long history and splendid culture. This cultural exchange and integration provide a good humanistic environment for economic and trade cooperation between the two sides. The increasing exchanges and interconnection between China and Russia in the fields of culture, education, science and technology have not only enhanced the understanding and friendship between the two peoples, but also provided more opportunities for economic and trade cooperation. China and Russia have become important trading partners as their bilateral trade volume continues to grow in recent years (see *Fig.*). China-Russia trade has maintained a steady development, with the scale of trade expanding and the trade structure being optimized [2]. China and the Russian Federation will continue to strengthen economic cooperation and promote the development of practical cooperation in various fields to a higher level.

According to China's General Administration of Customs, the trade volume between China and Russia reached 240.11 billion dollars, up 26.3% year-on-year, and the target of 200 billion dollars was reached ahead of schedule. Russian exports to China rose 12.7% to about $ 129.14 billion, while Russian imports of Chinese goods rose 46.9% to $ 110.97 billion. Experts predict that trade turnover between Russia and China will continue to grow in 2024 and may reach a record $ 250 billion by the end of the year.

Sustainable development is a concept that focuses on the balanced development of the economy, society and the environment. It stresses that, in the process of economic development, due consideration should be given to the carrying capacity of resources, the environment and the stability of the ecosystem to ensure the rational use of natural resources and the good protection of the environment, so as to achieve a harmonious coexistence of the three mentioned elements: the economy, society and the environment. Against the backdrop of the growing awareness of the sustainability narrative, green finance has become a new driving force in promoting economic development and sustainable development, mainly because it integrates consideration of environmental protection and social responsibility into financial activities, making it possible to harmonize economic development with environmental protection [3]. Green financial instruments, such as green bonds, green loans and green funds, provide financial support for renewable energy projects, energy storage technologies and clean energy supply and distribution [4]. These funds help promote the research and development and application of green energy technologies, reduce carbon emissions, and improve energy efficiency, thus achieving a win-win situation for both the economy and the environment [5]. Co-operation and development in the field of green finance between China and Russia is not only related to the countries' sustainable economic development but also plays a big role in the global environmental protection provision [6].

LITERATURE REVIEW

In recent years, China-Russia economic and trade cooperation, as an important part of international

[1] Chinese-Russian border length is 4209,3 km second after Kazakhstan-Russian border — 7512,8 km.

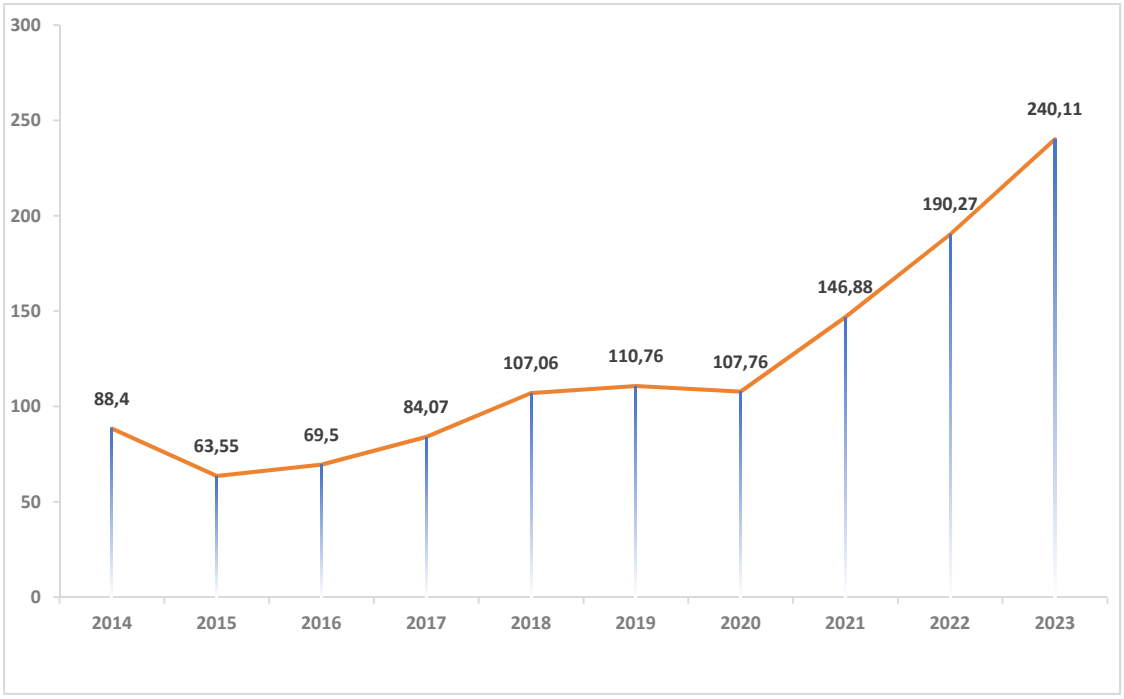

Fig. **Trade Volume Between China and Russia (Mlrd Doll. USA)**

Source: Statistical data from the general administration of customs of China.

relations, has received extensive research and attention. Ch. H. Li [7] emphasized the importance of China-Russia comprehensive cooperation for the real interests of both sides and the stable development of the world economy. He points out that in the context of glocalization and economic integration by deepening economic and trade cooperation, China and Russia can not only promote the economic growth and prosperity of both sides, but also make a positive contribution to world peace and stability [7]. This view provides important theoretical support for our understanding of the importance of China-Russia economic and trade cooperation. G. Ch. Xing [8] examines the challenges and opportunities facing China-Russia cooperation from a political and economic perspective. He argues that in the ever-changing global environment, China and Russia need to further strengthen their cooperation to address jointly various challenges and achieve mutual benefits and win-win results [8]. This view emphasizes the strategic significance of China-Russia cooperation in the global environment and provides an important context for the application of green finance in China-Russia economic and trade cooperation. H. Q. Liu [9] discusses in detail the development trends, modes and prospects of China-Russia economic and trade cooperation. He argues that China-Russia economic and trade cooperation is an important resource for future cooperation between the two countries, and is of great significance in promoting the economic growth and prosperity of both sides [9]. H. P. Kuznetsova, et al. explored specific examples of energy cooperation between the two countries at the micro and macro levels, which also provides an important reference for the application of green finance in energy cooperation [10]. Z. J. Wang et al. provide an overview of the historical trend of global carbon emissions and analyse the characteristics of carbon-neutral policies in key countries, emphasizing the importance of international cooperation in promoting the global low-carbon transition [11]. Q. Sun [12], M. Feng [13] and P. L. Xu et al. [14–16] provide an in-depth analysis of Russia's low-carbon development strategy under the global climate agenda in light of its carbon neutrality target, emphasizing the key role of green financial instruments in guiding financial flows to green projects and promoting low-carbon transition. Meanwhile, the study by M. H. Dan [17], F. Liu [18] and L. Wang [19] further outlines Russia's low-carbon development path and stable pursuit of carbon neutrality targets, emphasizing the important role of green finance in promoting sustainable development.

The importance of green finance in China-Russia trade cooperation has been studied by scholars. H.B. Xiao and X.R. Ge [20], in discussing the development of new energy and green economy in Russia, emphasize the key role of green finance in promoting the transformation of energy structure and the development of green economy. They argue that through the development of green finance, Russia can better respond to the challenges of global climate change and achieve sustainable economic development goals [20]. Y. Shang and Y. S Han [21] further analyse Russia's Green New Deal in addressing the challenges of a carbon-neutral era. They point out that green finance, as an important means to achieve green transformation, is of great significance in promoting trade cooperation between China and Russia [21]. By strengthening cooperation in the field of green finance, the two countries can jointly promote the development of a green economy and achieve mutual benefits [18]. Some scholars have also focused on the potential of green finance in the context of China-Russia trade cooperation. For example, Y. Wang et al. [4] analyzed the historical trend of carbon emissions and the characteristics of carbon-neutral policies in key countries, and put forward proposals for Russia-China cooperation in the areas of carbon emission reduction and green finance [4]. Z.W. Kang and X.S. Cao [22] on the other hand, explore the new development of Russia's environmental policy in the context of carbon neutrality and its impact on China-Russia cooperation and emphasize the important role of green finance in promoting environmental cooperation between the two countries. I. Grazilina and I. Zabelina [23] point out that the Silk Road Economic Belt offers new opportunities for green growth in the Russian economy's Far-Eastern region, emphasizing the importance of green growth in promoting economic development sustainability. This study provides a macro context for understanding the role of green finance in regional China-Russia trade cooperation [23]. D.M. Chu [24] noted that Russia has deeply recognized the importance of a green economy for the country's sustainable development and has taken a series of policy measures to promote the green economy. This provides potential opportunities for cooperation between China and Russia in the field of green finance. In the face of changes in the international political and economic environment, the choice of Russia's low-carbon development path in the energy sector has become a research hotspot [25]. V.I. Voloshin, O.E. Nazarova and S.X. Chen [26] show that, in the face of external sanctions, Russia needs to accelerate the transformation of its energy structure and promote the development of low-carbon energy, in order to ensure energy security and sustainable development of the economy. This provides an important practical basis for the application of green finance in China-Russia energy cooperation. Some scholars — Y.C. Ji [27], P. Zhou, L. Ma [28], R. Bao [29] and Y. Liu [30] have emphasised the role of the Green Belt and Road Initiative in promoting global green development. Together, these studies reflect the positive contribution of the Belt and Road Initiative in promoting energy cooperation, the development of environmental protection industries, and ecological cooperation, providing strong theoretical support and practical guidance for achieving sustainable development.

In terms of the relationship between green finance and economic growth, several scholars have conducted in-depth discussions. J.H. Gong further discusses the relationship between green finance development and industrial structure adjustment as well as China's economic growth, revealing the positive role of green finance in promoting industrial structure optimization and economic growth model upgrading [31]. Specifically on the impact of green finance in China-Russia trade cooperation, the study by Y.J. Xiang, W.F. Zhang and B. Zh. Shi provides us with the perspective of empirical analysis. They found out through empirical analysis that the development of green finance can promote the growth of China's export trade, which provides data support for the application of green finance in China-Russia trade cooperation [32]. Zh. Wang emphasises the key role of green finance in promoting high-quality economic development [33]. B. Li on the other hand, puts forward a proposal to create a specialised insurance institution in the field of science and technology green finance to support scientific and technological innovation and green development [34]. Q.J. Zhang and R.'s Chen study examines the impact of green financial policy innovation on energy consumption carbon emission intensity, revealing the importance of the resource allocation effect and the green innovation effect [35]. Y. Yu on the other hand, points out that the insurance industry has made continuous efforts in continuously improving the quality of green finance [36].

This study will focus on the role of green financial instruments in promoting China-Russia trade. For

example, the impact of the development level of green financial instruments such as green insurance, green credit, green bonds and green funds on the volume of trade between China and Russia. Through in-depth analysis of the application of green financial instruments, we will explore how to better use green financial instruments to promote the green development of China-Russia trade and contribute to the sustainable development of the two economies.

RESEARCH METHODOLOGY AND DATA SOURCES

Research methodology: this study mainly adopts quantitative analysis methods, combining statistical analysis and econometric modelling, to explore in depth the impact of the development level of green financial instruments on China-Russia trade relations. Firstly, through literature review and theoretical sorting, it determines the measurement indexes of the level of green financial development, including green insurance, green credit, green bonds and green funds; secondly, it collects relevant data, constructs econometric models, and carries out empirical analyses on the relationship between the level of development of green financial instruments and Russia-China trade turnover; and lastly, based on the empirical results, it draws conclusions of the study and puts forward policy recommendations. In this study, a multiple linear regression model is used to carry out regression analyses with China-Russia trade volume as the dependent variable and independent variables such as the level of development of green financial instruments, GDP and population. In the process of model construction, considering the availability and completeness of data, this study selected 22 provinces in China as samples, which have more frequent trade transactions with Russia and can better represent the overall situation of China-Russia trade. In the model construction, this study takes the trade volume between China and Russia as the dependent variable and the development level of green financial instruments, GDP and population as the independent variables. Considering the differences in economic development, resource endowment and industrial structure of different provinces, the study will introduce province fixed effects to control these potential influences. Meanwhile, in order to test the robustness of the model, the study will also use other econometric methods, such as panel data analysis and time series analysis, for further validation.

Data sources: The data in this study are mainly from the public data of official statistical agencies, financial institutions and academic research institutions. Among them, the data on China-Russia trade volume are mainly from the official statistics of the General Administration of Customs of China and the Russian Federal Customs Service; the data on the level of development of green financial instruments are mainly from the reports and statistical data released by financial regulators such as the People's Bank of China, the Banking and Insurance Regulatory Commission and the Securities Regulatory Commission, as well as annual reports of financial institutions, such as major commercial banks, insurance companies, and securities firms; the data on the macro-economy, such as the GDP and population, are from the National Bureau of Statistics and provincial statistical bureaus. Macroeconomic data, such as GDP and population, come from the official releases of the National Bureau of Statistics and provincial statistical bureaus.

It should be emphasized that due to the limitations of data collection and collation in the development of green financial instruments, their statistics may be incomplete or difficult to access. In this case, the study will combine the existing research results and expert opinions to make reasonable extrapolations and supplement the missing data. Meanwhile, for the imputed data, the study will cautiously assess their error rates and make clear explanations in the text. According to the imputation and assessment, the error rate of the data is roughly around 5% to 10%. Despite this margin of error, the study will endeavor to ensure the reliability and validity of the findings through scientific methods of analysis and a rigorous process of justification.

TYPES AND ROLE OF FINANCIAL INSTRUMENTS

With the gradual increase in awareness of environmental protection, green financial instruments are playing an increasingly important role in promoting global sustainable development. In Russia-China trade relations, green finance has not only injected new vigor into the economic cooperation between the two countries, but also promoted the green transformation of trade structures.

Green credit, green insurance, green bonds, and green funds, as the four pillars of green finance, each have a unique role to play in promoting sustainable development provision. Green credit promotes the development of clean energy, energy conservation, and emission reduction through the provision of loans to environmental protection projects. Green insurance, on the other hand, reduces the risks faced by enterprises due to environmental pollution by providing products such as environmental pollution liability insurance. Green bonds provide a channel for enterprises and governments to raise funds to support the construction of green projects. Green funds, on the other hand, bring together social capital and focus on investing in green industries, promoting the innovation and application of green technologies.

In order to quantitatively assess the level of development of these green financial instruments, the following four indicators are used in this paper:

1. G_Credit: the credit share of environmental protection projects. The credit share of environmental protection projects refers to the proportion of environmental protection projects in the total credit of the province. The total credit of environmental protection projects in the province indicates the total amount of loans provided by all banks and other financial institutions for environmental protection projects within the province, which is formulated as follows:

$$\text{G\_Credit} = \frac{\text{The total amount of credit loans of environmental protection projects}}{\text{The total amount of loans}}.$$

The G_Credit indicator assesses the extent of financial institutions' support for environmental projects by calculating the proportion of total credit for environmental projects to total credit in the province. This indicator reflects the relative importance of environmental projects in the credit market.

2. G_Insurance: the degree of promotion of environmental pollution liability insurance. The degree of promotion of environmental pollution liability insurance indicates the proportion of environmental pollution liability insurance in all the business of the insurance company, reflecting the degree of promotion and acceptance of the insurance. The environmental pollution liability insurance income refers to the premium income that the insurance company receives from the environmental pollution liability insurance business, and the total premium income refers to the sum of premium income received by all the business of the insurance company. And total premium income refers to the sum of premium income received by the insurer from all its businesses.

The formula is:

$$\text{G\_Ins} = \frac{\text{The total environmental pollution liability insurance}}{\text{The total premium}}.$$

G_Insurance assesses the prevalence of environmental pollution liability insurance in the insurance market by calculating the ratio of environmental pollution liability insurance revenue to total premium revenue of insurance companies. This indicator reveals the level of attention and management of environmental risks by insurance companies.

3. G_Bond: the degree of green bond development, which indicates the share of green bonds in the bond market, reflects the scale of green bond issuance and market acceptance. Total green bond issuance is the total amount of all green bonds issued in the market. The total amount of all bonds issued means the total amount of all types of bonds issued in the market. The formula is:

$$\text{G\_Bond} = \frac{\text{Total green bond issuance}}{\text{Total bond issuance}}.$$

G_Bond, on the other hand, measures the extent to which green bonds have grown in the bond market by calculating the ratio of total green bond issuance to total issuance of all bonds. This indicator reflects the activity and market acceptance of the green bond market.

4. G_Fund: Green Fund Share, Green Fund Share indicates the relative size and importance of Green Funds in the fund market. Total Green Fund Market Capitalization is the sum of the market value of all Green Funds, and Total Market Capitalization of All Funds means the sum of the market value of all types of funds in the market, which is given by the formula:

$$\text{G\_Fund} = \frac{\text{Total market capitalisation of green funds}}{\text{Total market capitalisation of all funds}}.$$

5. The G_Fund indicator assesses the relative size and importance of green funds in the fund market by

Table 1

Variable Interpretation

Name (of a thing)	Variable	Indicate	Unit (of measure)
Implicit variable	Exp	Exports to Russia	Million dollars
Independent variable	G_credit	Percentage of credit loans for environmental projects	–
	G_ins	Extent of promotion of environmental pollution liability insurance	–
	G_bond	Extent of green bond development	–
	G_fund	Percentage of green funds	–
Control variable	Gdp	Gross Domestic Product	Billions yuans
	Exall	Total exports	Million dollars

Source: Calculations based on data compiled by China's General Administration of Customs, financial institution statistics and the National Bureau of Statistics, among others.

calculating the total market capitalization of green funds as a proportion of the total market capitalization of all funds. This indicator reflects the level of activity and influence of green investments in the capital markets.

The calculation of these indicators is based on actual business data, and by comparing the proportionality of the numerator and denominator, it is possible to intuitively understand the development status and market performance of various areas of green finance. In green finance policymaking, investment decision-making and market analyses, these indicators have important reference value, providing all parties with a quantitative basis for measuring the level of green finance development.

EMPIRICAL ANALYSIS

In this study, data from 22 provinces in China for the past 11 years were selected as a sample, and the data on export value to Russia from these 22 provinces were used to analyse statistically the multiple linear regression model used in conjunction with the share of green credit, green insurance, green bonds, and green funds, which is capable of analyzing the combined effect of multiple independent variables on the dependent variable. By collecting and analyzing the data of 22 provinces for the past 11 years, and analyzing the impact of the proportion of green financial instruments on the export volume. It not only helps to deeply understand the role of green finance in international trade, but also provides reference information for policy improvement. The variables used in the model and their explanations are shown in *Table 1*.

The model equation is $Exp = G\_credit + G\_ins + G\_bond + G\_fund + Gdp + Exall + \varepsilon$.

In the sample of 22 provinces in the last 11 years, as presented in *Table 2* the data after logarithmic treatment show that the export value (exp) to Russia of each province shows certain distributional characteristic, with a mean value of 2.99 and a standard deviation of 0.62, indicating that the export value still has some differences among different provinces, but it may be smoother compared with the original data. Meanwhile, the green financial indicators such as green credit index (G_credit), green insurance (G_ins), green bond (G_bond) and green fund (G_fund) after logarithmic treatment, their mean values are 0.044, 0.086, 0.136 and 0.062 respectively, which also show a certain range of distribution, suggesting that differences between provinces in green financial development still exist on the logarithmic scale. In addition, the logarithmically processed GDP (Gdp) and overall total exports (Exall) of the provinces have a mean value of 4.75 and 4.70, respectively, showing a relatively stable level.

Through logarithmic processing, we can not only better capture the proportional changes in the data, but also reduce the influence of heteroskedasticity to a certain extent, making the subsequent data analysis and model building more accurate and reliable. Further research

Table 2

Descriptive Analysis

Variable	Obs	Mean	Std. Dev.	Min	Max
Exp	242	2.989256	0.6199467	1.4	4.28
G_credit	242	0.0441065	0.0048521	0.0345973	0.0571173
G_ins	242	0.0861214	0.0113201	0.0660977	0.1140673
G_bond	242	0.1355989	0.0178379	0.1085581	0.1852994
G_fund	242	0.0617719	0.0088382	0.0470035	0.0883868
Gdp	242	4.747667	0.5072041	3.64831	5.90307
Exall	242	4.701118	0.2305556	4.1345	5.54284

Source: Calculations based on data compiled by China's General Administration of Customs, financial institution statistics and the National Bureau of Statistics, among others.

Table 3

Relevance Analysis

Variable	Exp	G_credit	G_ins	G_bond	G_fund	Gdp	Exall
Exp	1						
G_credit	0.2532	1					
G_ins	0.2811	0.8311	1				
G_bond	0.318	0.8413	0.9591	1			
G_fund	0.3126	0.8118	0.9317	0.959	1		
Gdp	0.7714	0.1071	0.1739	0.1909	0.1773	1	
Exall	0.3226	−0.0342	0.0336	0.0155	−0.0017	0.3726	1

Source: Calculations based on data compiled by China's General Administration of Customs, financial institution statistics and the National Bureau of Statistics, among others.

can explore the potential relationship between these logarithmized financial indicators and export value, thus providing a more scientific basis for policy formulation.

In the sample of 22 provinces examined over the last 11 years, as presented in *Table 3* data processed by logarithmic processing show that the variables show linear correlations of varying degrees. Export value (Exp) is positively correlated with green credit index (G_credit), green insurance (G_ins), green bond (G_bond) and green fund (G_fund), although the correlation coefficients are relatively low, suggesting that there is a certain degree of positive linkage between green financial development and export trade. In addition, the correlation between export volume (Exp) and GDP (Gdp) is strong at 0.7714, indicating a strong relationship between export trade and economic growth.

On the other hand, there are also significant positive correlations between various green financial indicators, such as the high correlation coefficients between the green credit index (G_credit) and green insurance (G_ins), green bond (G_bond) and green fund (G_fund), suggesting that the development trends of these green financial indicators are similar and mutually reinforcing among different provinces. However, the correlation between GDP and some of the green finance indicators is low, implying that the direct contribution of the current green finance development to economic growth may not be significant.

It is worth noting that total exports (Exall) are

Table 4

Regression Analysis

Source	SS	df	MS Number of obs =	242
			F(6, 235) =	69.2
Model	59.148293	6	9.85804884 Prob > F =	0
Residual	33.4761773	235	.142451818 R — squared =	0.6386
			Adj R — squared =	0.6294
Total	92.6244703	241	.384333902 Root MSE =	0.37743
Exp	Coef.	Std. Err.	t P > t [95% Conf.	Interval]
G_credit	14.58968	9.454546	1.54 0.124 –4.036818	33.21617
G_ins	–16.21939	7.809899	–2.08 0.039 –31.60575	–0.8330291
G_bond	6.199036	6.425136	0.96 0.336 –6.459189	18.85726
G_fund	13.88051	9.842529	1.41 0.160 –5.510357	33.27138
Gdp	0.8758277	0.0529292	16.55 0.00 –0.7715513	0.9801041
Exall	0.1801542	0.1147914	1.57 0.118 –.0459975	0.4063059
_cons	–2.960479	0.5536341	–5.35 0.000 –4.051199	–1.869759

Source: Calculations based on data compiled by China's General Administration of Customs, financial institution statistics and the National Bureau of Statistics, among others.

positively correlated with the value of exports (Exp), but have lower or even negative correlations with other green finance indicators, which may reflect the fact that the current direct link between total exports and specific green finance indicators is not strong.

The matrix of correlation coefficients after logarithmic processing provides us with a preliminary understanding of the linear relationships between the variables, but a deeper understanding of the mechanisms behind these relationships still requires further research and analysis.

The relationship between exports to Russia (exp) and green credit index (G_credit), green insurance (G_ins), green bonds (G_bond), green funds (G_fund), GDP (Gdp), and total exports (Exall) was explored through regression analyses in a sample of 22 provinces over 11 years of study.

In terms of the model's goodness of fit, as presented in *Table 4* the R-squared is 0.6386, indicating that the model explains about 64% of the variation in export value, while the adjusted R-squared is 0.6294, which is still high, indicating that the model's explanatory power is strong. In explaining the effects of the variables, the coefficients of green credit index (G_credit), green fund (G_fund) and green bond (G_bond), although positive, have low t-values and p-values greater than the commonly used significance level (e.g., 0.05), and thus the effects of these three variables on export value are not significant. This may be due to the lack of popularity, limited market acceptance and insufficient policy guidance of green credit, green fund and green bonds. Meanwhile, the impact of green bond (G_bond) on export volume is smaller that of green credit (G_credit) and green fund (G_fund) may be due to the fact that the issuance and use of green bond in the market is relatively small.

The coefficient of green insurance (G_ins) is negative and significant (t-value is –2.08, P-value is less than 0.05), which indicates that the increase of green insurance inhibits the increase of export volume to Russia, which may be due to the implementation of green insurance increases the operating cost of enterprises, which to some extent leads to higher prices of products and reduces the competitiveness of the products, thus affecting the export volume. The regression coefficient of Gdp (GDP) is positive and significant (t-value of 16.55, P-value less

than 0.001). GDP is a key indicator of the economic scale and production capacity of a country or region. When GDP grows, it indicates that China's production capacity is also increasing and it is able to provide a wider variety of goods and services, thus increasing exports to Russia. The coefficient on total exports (Exall) is positive but not significant, probably because exports to Russia account for a small share of China's total exports (around 3 per cent in 2023), but this effect should gradually increase as China-Russia trade continues to deepen and grow in size.

The results of regression analysis show that GDP is the most influential factor on export amount in the sample of 22 provinces in the last 11 years examined, while green insurance has a significant negative correlation with export amount. The green credit index, green bonds, and green fund amount indicators do not have a significant impact on the export volume. Among them, green credit index and green fund amount have a greater impact on export value than green bond on export value.

CONCLUSIONS AND RECOMMENDATIONS

The paper uses quantitative methods of analysis, combining statistical analysis and econometric modelling to explore in depth the impact of the level of development of green financial instruments on trade relations between China and Russia, and draws the following conclusions:

1. The cultures of Russia and China often reveal a commonality of the initial principles of the world order and worldview ("world-project integrity"). Similar semantic foundations of Russian and Chinese civilizations can be considered as a factor of influence in the modern world and the basis of Eurasian cooperation and sustainability. Subject to certain conditions and prerequisites, the most obvious characteristic of this cooperation is reflected in the construction of a system of trade and economic cooperation ties between the countries in question.

2. The strategic importance of China-Russia economic and trade relations is not only reflected in the cooperative position of the two countries in the international arena, stemming from deep geographical, historical and cultural ties. This relationship has injected a constant impetus into the economic development of both sides, while realizing the sharing of resources and complementing each other's advantages. With the global emphasis on green finance and sustainable development, China-Russia economic and trade cooperation should strengthen the green concept and jointly explore the road of green transformation, so as to promote the development of the two economies in a greener and more sustainable direction.

3. Green insurance has dampened the growth of exports to Russia, probably because it makes products more costly and affects firms' export competitiveness.

4. The impact of green financial instruments such as green credit, green bonds and green funds on Russia's exports is relatively small, mainly due to the lack of popularity, limited market acceptance, and the lack of Chinese and Russian research on the application of green financial instruments in export trade, which makes it impossible to fully explore and make use of the potential of these financial instruments to promote the greening of trade between the two countries, and other reasons.

5. The impact of total exports versus exports to Russia is insignificant; the size of China-Russia trade has grown in recent years, but Russia's share of China's total export market remains relatively small.

Strengthening China-Russia economic and trade cooperation, especially promoting the application of green finance in the trade between the two countries, is of great significance in promoting the sustainable development of both economies. In response to the analysis of the findings, the following recommendations are made:

1. To deepen China-Russia economic and trade cooperation and incorporate the concepts of green finance and sustainable development, the two Governments should strengthen communication and cooperation on green economic and trade policies, promote the innovation of green financial products by financial institutions and encourage in-depth cooperation in the fields of green technology and environmental protection. At the same time, they should optimize the trade and investment environment, reduce tariff barriers and strengthen humanistic exchanges to enhance mutual understanding and friendship between the two peoples, so as to lay a solid foundation for green and sustainable economic and trade cooperation.

2. Optimizing green insurance policies and product design. The Government should conduct an in-depth study of the impact of green insurance on the costs of enterprises and consider ways to alleviate the burden of increased costs due to green insurance on enterprises through financial subsidies and tax incentives.

Encourage insurance companies to develop more green insurance products that meet the actual needs of enterprises and increase the popularity and market acceptance of green insurance. Strengthen publicity and training on green insurance, and raise awareness and understanding of green insurance among enterprises and the public.

3. Promote the development and application of green financial instruments. The Government should increase its efforts to promote green financial instruments such as green credit, green bonds and green funds, and increase their popularity in the market. Strengthen policy guidance, provide preferential policies and convenient conditions for enterprises using green financial instruments, and reduce their financing costs. Encourage financial institutions to innovate green financial products to meet the diversified financing needs of enterprises. Strengthening research in related areas and exploring the mode of application of green financial instruments in China-Russia trade.

4. Deepening China-Russia trade co-operation. The government should continue to strengthen trade cooperation with Russia and promote the expansion of the scale and optimization of the structure of bilateral trade. Strengthen research on the Russian market to understand the needs and preferences of Russian consumers and provide enterprises with more targeted market information. Encourage enterprises to expand their export business to Russia and increase the share of Chinese products in the Russian market.

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