

Prospects for the development of cross-border e-commerce between Russia and China

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Abstract

The paper examines the prospects and peculiarities of the development of cross-border e-commerce between Russia and China. The degree of e-commerce impact on trade turnover between Russia and China is assessed using an econometric model based on the analysis of trade flows between BRICS countries in the period from 2000 to 2022. The results obtained indicate that with an increase of 1% in the number of Internet users in Russia and its trading partners from the BRICS countries, the trade turnover increases by 0.19%. The paper also identifies the key challenges faced by entrepreneurs engaged in cross-border e-commerce between Russia and China and offers guidelines for these countries' cooperation in the field of e-commerce. Based on the analysis of the relevant data the paper concludes that integration of digital technologies and increased access to the Internet contribute to the strengthening of trade ties between Russia and the BRICS countries, thus opening up new prospects for the development of cross-border e-commerce.

Keywords

BRICS, cross-border e-commerce, digital economy, e-commerce, gravity model, Sino-Russian trade relationships.

Аннотация

Данная статья посвящена исследованию перспектив и особенностей развития трансграничной электронной коммерции между Россией и Китаем. Степень влияния электрон-

ной коммерции на товарооборот между Россией и Китаем оценивалась с помощью эконометрической модели, основанной на анализе торговых потоков между странами БРИКС в период с 2000 по 2022 годы. Полученные результаты свидетельствуют о том, что при увеличении на 1% количества пользователей Интернета России и ее торговых партнеров среди стран БРИКС товарооборот между ними увеличивается на 0,19%. В статье также обозначены ключевые вызовы и проблемы, с которыми сталкиваются предприниматели, осуществляющие трансграничную электронную коммерцию между Россией и Китаем, и предложены основные направления сотрудничества между странами в сфере электронной коммерции. Исходя из анализа данных, представленного в данной статье, можно сделать вывод, что интеграция цифровых технологий и расширение доступа к Интернету способствуют укреплению торговых связей между Россией и странами БРИКС, что открывает новые перспективы для развития трансграничной электронной коммерции.

Ключевые слова

БРИКС, трансграничная электронная торговля, цифровая экономика, электронная коммерция, гравитационная модель, российско-китайские торговые отношения.

JEL: C23, F14, L81, O24.

Introduction

Today's global online commerce market is one of the fastest growing sectors of the global economy. UNCTAD estimates that the global online commerce in 2019 amounted to approximately \$26.7 trillion and 30% of global GDP. In recent years, China's e-commerce market has become one of the largest in the world, having grown from \$4.56 trillion to \$6.66 trillion between 2018 and 2022. The Russian e-commerce market is also showing high growth rates. In the period from 2018 to 2022, it has tripled in size amounting to \$59.64 billion. The potential for cross-border e-commerce between Russia and China is rather high, given the size of the economies of these countries and the growing demand for Chinese goods from Russian consumers caused by the economic sanctions against Russia in 2022. However, there are challenges that may hinder the development of e-commerce between the countries, including differences in the regulatory framework, logistics infrastructure and cultural factors.

The purpose of this study is to examine the features of China and Russia's cooperation in cross-border e-commerce, identify its prospects and assess its impact on the trade turnover between the countries. The results of this study may be useful both for entrepreneurs engaged in cross-border e-commerce and for government authorities that regulate this industry.

Literature review

There are different approaches to defining e-commerce, as well as different ways of measuring it. Statista defines e-commerce as the sale of physical goods through

a digital channel to a private end user (B2C). This definition covers purchases via desktop computers (including laptops and laptops) as well as purchases via mobile devices. In our view, this definition is too narrow as it misses an important aspect of B2B trade, which accounts for more than 80% of total global e-commerce. UNCTAD defines e-commerce as the sale or purchase of a good or service conducted over computer networks by methods specifically designed to receive or place orders. This definition includes trade in goods and services with both individuals and organizations.

We base our study on the analysis of prior academic research on the topic of e-commerce. Chen Y. points out the increasing trend in cross-border e-commerce research from 2019. In 2021, due to the effects of the coronavirus pandemic, the topic of cross-border e-commerce has attracted considerable attention from researchers (Chen et al., 2022).

Hazarika B. and Mousavi R. provide an analytical review of academic publications on e-commerce and highlight the key factors contributing to the development of cross-border e-commerce (Hazarika & Mousavi, 2022). Among them are the ability to use a computer and the Internet, the level of development of IT infrastructure and the convenience of making payments in foreign currencies.

He X. and co-authors analyze the dynamics of cross-border e-commerce (CBEC) research development over different time periods and categorize the field into five different research clusters (He et al., 2023).

Zou M. notes in his study that the performance of cross-border e-commerce in the eastern region of China is superior to that of the central and western regions. This is due to the higher internet penetration rate, the intensity of foreign direct investment and the significant number of government programs to support e-commerce (Zou, 2022).

Zhao J. emphasizes that the “One Belt, One Road” initiative is seen as a key point in the study of cross-border e-commerce development between China and Russia (Zhao, 2018).

Liu A. and co-authors point out that the main obstacles to China’s cross-border e-commerce development are low customs clearance efficiency, high logistics costs and associated risks (Liu et al., 2022).

Kashin V. and Yankova A. identify key obstacles to the development of cross-border e-commerce between Russia and China, including the limited market capacity of Russian border areas, insufficiently developed legal and regulatory framework for Russian-Chinese cross-border cooperation, and low implementation rates of joint projects (Kashin & Yankova, 2021).

Lei Y. and Qiu X. apply machine learning algorithms to analyze China’s cross-border e-commerce and evaluate China’s trade relations with 62 countries (Lei & Qiu, 2021). The main findings of the article are that most European countries among the Belt and Road have a favorable environment for cross-border e-commerce. Among these countries are Poland, Czech Republic, Slovakia and others.

He Y. and Wang J. carry out the panel analysis of cross-border e-commerce using ASEAN countries as a case study. The researchers find that GDP and real exchange

rate have a significant impact on cross-border e-commerce. However, population size and terms of trade exclusively affect cross-border e-commerce imports (He & Wang, 2019).

Wang C. and co-authors analyze the impact of cross-border e-commerce on China's exports using the gravity trade model. The study shows that cross-border e-commerce has a significant impact on China's export performance. The results indicate that for every 1% increase in the number of Internet users among China and its trading partners, China's export volume increases by 0.28% (Wang et al., 2021).

Yin Z. and Choi C. examine the impact of China's cross-border e-commerce (CBEC) on exports of goods and services to Belt and Road Initiative (B&R) countries from 2000 to 2018 using a gravity model. Their analysis shows that CBEC has a stronger positive impact on trade in services than on trade in goods (Yin & Choi, 2023).

Also, there is a number of companies, such as Data Insight, Asia Pacific, AdIndex, NetEconomy, that provide detailed reports on the Russian and Chinese e-commerce markets.

Methods

The study employed both quantitative and qualitative research methods. The global e-commerce market was analyzed using UNCTAD statistical data. To analyze the Russian and Chinese markets, data from the Online Retail Association and the Electronic Commerce Research Center were used (Online Retail Association, 2023; China E-Commerce Research Center, 2023). The analysis of the main features and drivers of market development in each country allowed the authors to determine the prospects for cooperation between Russia and China in the field of e-commerce.

Characteristics of the global e-commerce market

The e-commerce market has been growing steadily in recent years, driven by the epidemic situation in the world and the development of digital technologies. According to a UNCTAD report, the global e-commerce market was \$26.7 trillion in 2019 (UNCTAD, 2021), which corresponded to 30% of global GDP. The B2B sector of global e-commerce in 2019 was \$21.8 trillion, representing 82% of all e-commerce, including both sales through online platforms and electronic data interchange (EDI) transactions. The B2C e-commerce sector was valued at \$4.9 trillion in 2019, up 11% from 2018. The top three B2C e-commerce sales sectors were China, the US and the UK.

The major players in the global e-commerce market in 2022 were Walmart, Amazon, Apple, The Home Depot, JD.com, and Alibaba (Figure 1).

Revenue of the largest players in the global e-commerce market in 2022, USD bln.

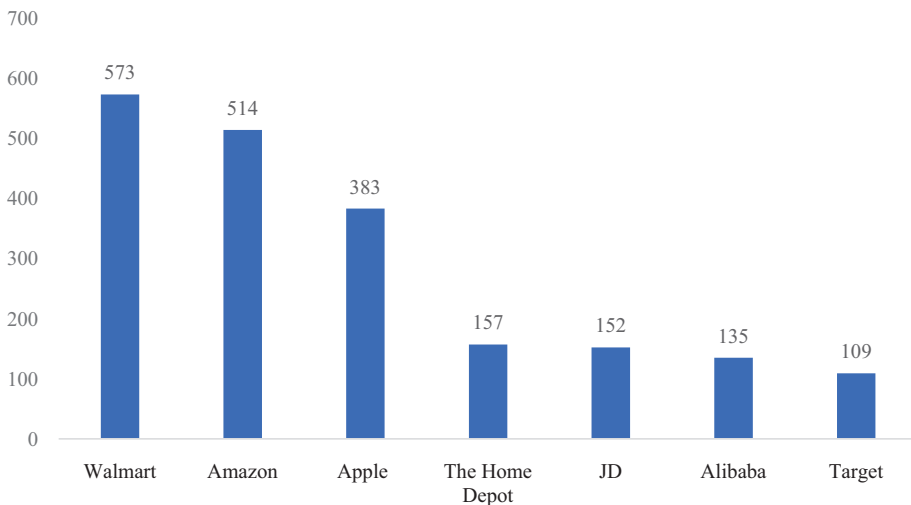


Figure 1. Revenues of major online retailers in 2022. *Source:* made by the author based on financial statements of companies

Cross-border e-commerce was also showing high growth rates. In 2019, cross-border online commerce totaled \$440 billion, up 9% year-on-year.

One of the key drivers of cross-border e-commerce growth is the emergence of online marketplaces such as Amazon, Alibaba and eBay, which have enabled sellers and buyers to connect across borders and facilitate cross-border transactions. These marketplaces have also allowed small businesses to enter global markets, levelling the playing field and creating new opportunities for growth.

Today, the increasing internet penetration and availability of smartphones are expected to drive further growth as the majority of millennials use smartphones and tablets to order goods. The market is also driven by the growing preference for online shopping due to the influence of social media on the purchasing habits of customers. Besides, the growing ease and affordability of international shipping, availability of information about overseas products and prices, and development of online payment systems that enable cross-border transactions are also contributing to the expansion of the cross-border e-commerce.

Yet, the development of the global e-commerce market faces a number of obstacles, including regulatory challenges, logistical complexities, cultural and language differences, and data privacy and security concerns. Regulatory barriers often arise from differences in national trade policies, taxes and e-commerce standards, making it difficult for businesses to operate seamlessly across borders. Logistical challenges, such as high cost and delivery times, reduce the efficiency of cross-border e-commerce. Cultural and language differences require businesses to tailor marketing strategies

and localize websites to effectively communicate and resonate with consumers in different regions. Concerns about protecting personal information and the fear of data breaches may deter consumers from engaging in online transactions.

Characteristics of e-commerce markets in China and Russia

China’s e-commerce market has grown significantly in recent years. According to a report published on the website of China E-Commerce Research Center, the market size in 2022 reached \$6.65 trillion (China E-Commerce Research Center, 2023), increasing by more than \$2 trillion over the past 5 years (Figure 2).

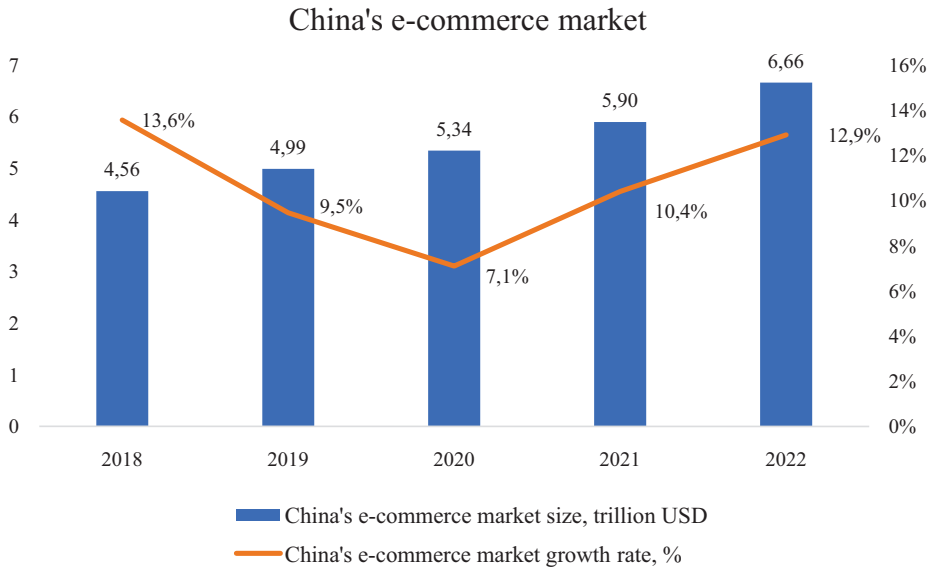


Figure 2. Chinese e-commerce market in 2018-2022. *Source:* China E-Commerce Research Center. Retrieved from <http://www.100ec.cn/zt/2022dzswscbg/>

China’s cross-border e-commerce market has increased by 74% over the past 5 years to reach a value of \$2.198 trillion (Figure 3).

According to CNNIC, the number of online shoppers in China crossed the 900 million mark in 2022, accounting for 86.0% of the country’s total Internet users (China Internet Network Information Center, 2022).

An important target group of the booming e-commerce sector in China is the mobile user segment. As of 2021, about 69 percent of e-commerce transactions were conducted via mobile devices, and this share is expected to rise to 75 percent by 2025 (Statista, 2023a). For many Chinese consumers, smartphones have become the primary choice for online shopping.



Figure 3. Chinese cross-border e-commerce market in 2018-2022. *Source:* China E-Commerce Research Center. Retrieved from <http://www.100ec.cn/zt/2022dzswscbg/>

The domestic platforms dominating the Chinese e-commerce market are Taobao and Tmall (Alibaba companies), accounting for 50.8% of the market share. They are followed by JD.com and Pinduoduo with 15.9% and 13.2% of the market respectively (International Trade Administration, 2023).

A distinctive feature of the e-commerce market in China is the use of domestic social media for marketing strategy. WeChat is China's most popular mobile social network, followed by Twitter-like Weibo, messaging app QQ, and short video app Douyin (Tiktok). Other platforms, such as Xiaohongshu, are specifically designed to optimize the intersection of e-commerce and social media.

Another factor of e-commerce expansion is China's own payment systems, such as Alipay, WeChat Pay and China UnionPay. Alipay and WeChat Pay allow users to make online and offline payments using QR codes, facial recognition or phone numbers. China UnionPay unites all banks and payment service providers in China and supports cross-border transactions and international cooperation with other types of cards.

Russia's e-commerce market is the 14th largest in the world, with total sales expected to reach \$42.46 billion in 2023 (Statista, 2023b), overtaking Mexico's online commerce market by that measure. Between 2011 and 2022, the market increased more than 20-fold (Figure 4).

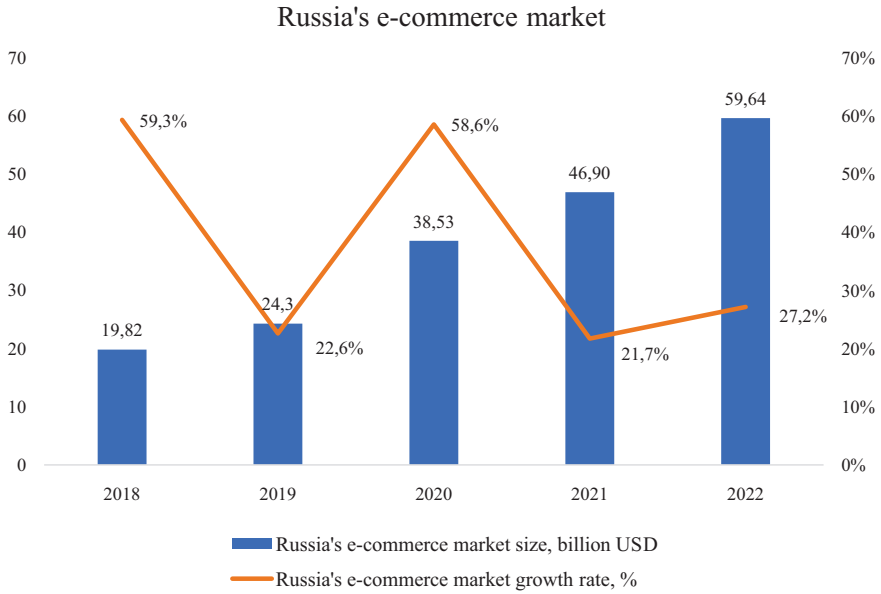


Figure 4. E-commerce market value in Russia in 2018-2022. *Source:* Association of Internet Trade Companies. Retrieved from <https://www.akit.ru/>

The Russian market of cross-border e-commerce has decreased over the last 5 years from \$6 billion to \$2 billion (Figure 5).

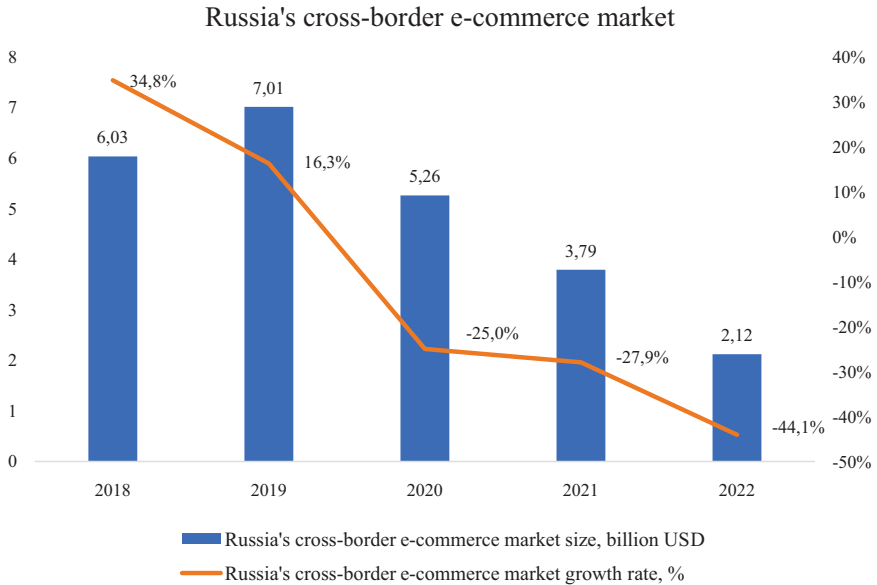


Figure 5. Cross-border e-commerce market value in Russia in 2018-2022. *Source:* Association of Internet Trade Companies. Retrieved from <https://www.akit.ru/>

A distinctive feature of Russia's online commerce market is the predominance of domestic commerce - about 96% of the market in 2022. Cross-border e-commerce held 3.55% of the market in the same year (Figure 6).

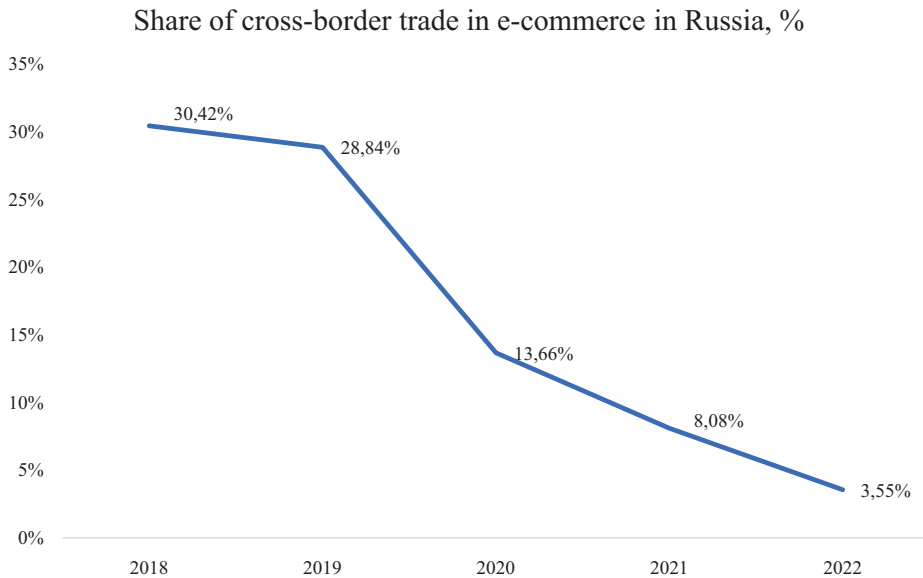


Figure 6. Share of cross-border trade in e-commerce in Russia in 2018-2022. *Source:* Association of Internet Trade Companies. Retrieved from <https://www.akit.ru/>

The share of online commerce in Russia's GDP has also grown: in 2019 it was 2.5% of GDP, while in 2022 it increased to 3.9% (Statista, 2023c).

In recent years, Russia has seen significant growth in online shopping: in 2013, 10% of urban residents between 16 and 55 years old made online purchases more than once a year; in 2021, this figure increased to 52% (Figure 7). The main drivers of growth were the COVID-19 pandemic during which consumers were forced to shop online, and the growing availability of infrastructure.

The Wildberries and Ozon marketplaces have a significant share of the online shopping market in Russia. In November 2022, the share of online orders made through these marketplaces amounted to 75% of all online orders. Data Insight estimated that Wildberries and Ozon would have a 53% share of revenue and 77% of online orders in 2023 (Data Insight, 2023).

After the departure of Apple Pay, Google Pay, Visa and Mastercard from Russia, the use of proprietary payment systems has increased. Due to the transition of public sector employees to Mir cards, the share of this payment system in the Russian market increased to 25% (Bank VTB, 2023). However, Visa and Mastercard cards can still be used when making online orders within the country.

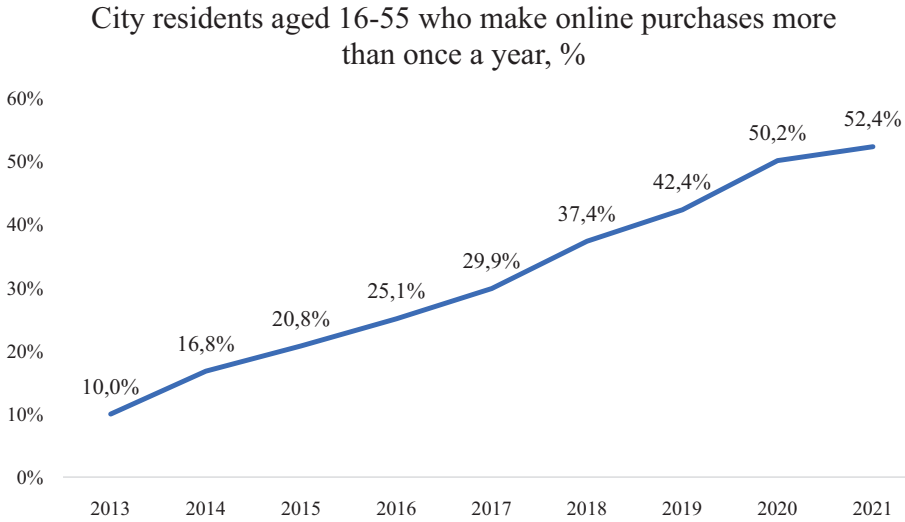


Figure 7. E-commerce penetration in Russia from 2013 to 2021. *Source:* Yandex. Retrieved from <https://yandex.ru/company/researches/2021/ecomdash#whatToBuy>

Cooperation between China and Russia in the sphere of e-commerce: areas, prospects and challenges

Although Russia and China have increased cooperation in e-commerce in recent years, there are several challenges faced by entrepreneurs in this field:

- Low efficiency of customs clearance. The customs clearance process for cross-border e-commerce is complicated and excessively time-consuming as it involves numerous parties, i.e. buyers, sellers, platforms, logistics providers, customs authorities, inspection agencies and tax bureaus. This often leads to delays, errors and increased costs for both buyers and sellers.
- Complex control and supervision. The two countries have their own consumer protection laws and their certification systems such as China Compulsory Certification (CCC) and Eurasian Conformity System (EAC) differ significantly, which results in uncertainty and risks for both parties.
- Problems with tax rebate regulation. The tax rebate policy for cross-border e-commerce in China is not uniform and transparent. There are different rates and methods to calculate and obtain tax rebate depending on various factors such as product category, platform and region. This may affect the profitability and competitiveness of sellers from other countries.
- Payment risks. Payment methods and systems for cross-border e-commerce in China and Russia are underdeveloped and hence not enough reliable. Possible problems relate to currency conversion, transaction fees, fraud prevention, insufficient data protection and lack of dispute resolution mechanism. This can affect both the trust and satisfaction of buyers and the profit of sellers.

Despite all these difficulties, there are good prospects for cooperation between China and Russia in cross-border online commerce, especially in the following areas:

- Establishing advisory centers, such as the Russian Export Center, and expanding their activities. These centers can play a key role in facilitating trade between the two countries by providing essential services such as market analysis, legal advice, customs compliance guidance, and logistical support. Such centers act as bridges, they smooth over cultural, regulatory and operational challenges that typically impede cross-border e-commerce.
- Increased presence of Russian and Chinese companies in each other's markets. China and Russia are home to more than 1.5 billion people, who generate significant demand for various goods and services. E-commerce can help them access a greater selection of goods, lower prices and better quality. The market size and potential of e-commerce between China and Russia is expected to grow further and companies such as Ozon can increase their presence in the Chinese market by attracting Chinese sellers to their platforms through which they now sell goods to Russian customers.
- Strengthening cooperation and coordination between customs authorities. China and Russia can work together to optimize customs clearance for cross-border e-commerce by, for example, introducing electronic data exchange, mutual recognition of inspection results, and preferential treatment for trusted traders.
- Establishing a common regulatory framework and standards. China and Russia can negotiate and sign bilateral or multilateral agreements on cross-border e-commerce, for example, by harmonizing standards on quality, security, taxation and consumer protection, or recognizing each other's standards as equivalent or compatible.
- Clarifying and standardizing tax rebate policies. China can improve its tax rebate policy for cross-border e-commerce by making it clear, consistent and transparent. It can also adopt a uniform or simplified method of calculating and receiving a tax rebate, such as using a flat rate or fixed amount.
- Development and integration of payment methods and systems. China and Russia can cooperate in developing and integrating their payment systems for cross-border e-commerce by reducing transaction fees, enhancing fraud prevention, ensuring data protection, and facilitating dispute resolution.

Empirical model

Although this study was initially focused on analyzing e-commerce between Russia and China, the sample was expanded to include the other BRICS countries in order to increase the number of observations and improve the quality of data. This expansion broadened the base for the analysis and made it more representative, facilitating the construction of a more accurate model.

In order to find out whether the development of e-commerce contributes to the growth of Russia's trade turnover with the BRICS countries, a gravity model of trade was chosen:

$$\ln(\text{TRADE}_{ijt}) = \beta_0 + \beta_1 \ln(\text{GDP}_{it} \text{GDP}_{jt}) + \beta_2 \ln(\text{EC}_{it} \text{EC}_{jt}) + \beta_3 \ln(\text{POP}_{it} \text{POP}_{jt}) + \beta_4 \ln(\text{REX}_{ijt}) + \beta_5 \text{CB}_{ijt} + \beta_6 \ln \text{DISTANCE}_{ijt} + \mu_i + \varepsilon_{it} \quad (1)$$

where j denotes Russia and the dependent variable TRADE_{ijt} denotes trade turnover between Russia and one of the BRICS countries (Brazil, China, India, South Africa) in year t . β_0 is a constant, $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6$ are estimated coefficients under explanatory variables.

The variables GDP_{it} and GDP_{jt} denote the GDP of country i and Russia in period t and POP_{it} represent the population of country i and Russia in period t . REX_{ijt} denotes the ruble exchange rate, CB_{ijt} is a dummy variable that equals one if Russia shares a border with country i and zero if it does not. DISTANCE_{ijt} represents the distance between the capital city of Russia and country i . EC_{it} and EC_{jt} denote the level of e-commerce use by Russia and country i .

In this model, the variables EC_{it} and EC_{jt} play a key role, reflecting the level of e-commerce development in Russia and the BRICS countries, respectively. According to the transaction cost theory, the integration of e-commerce into trade processes can reduce trade barriers and simplify search and transaction procedures, thereby increasing the total volume of trade. The variables EC_{it} and EC_{jt} are expected to have a positive effect on TRADE_{ijt} .

Other explanatory variables in the model are also important. The DISTANCE_{ijt} variable reflects the geographical distance between Russia and the BRICS countries, which is traditionally considered a significant factor in trade. However, given digitalization and the development of e-commerce, its influence may be weakened.

The CB_{ijt} variable as a binary indicator of common border can affect trade by reducing logistics and cross-border costs. In the case of Russia and BRICS countries, this variable will show differences in trade flows based on geographical proximity.

REX_{ijt} , reflecting the exchange rate, also plays an important role. Fluctuations in exchange rates can influence the competitiveness of goods, which in turn affects the volume of trade.

Data

To analyze the impact of e-commerce development on trade turnover between Russia and the BRICS countries, data for the period from 2000 to 2022 are used. The main source of trade data is the UN COMTRADE database (UN, 2023), from which export and import values between Russia and the BRICS countries were taken. Data on GDP and population of the countries were obtained from the official website of the World

Bank (World Bank Group, 2023). Exchange rate indicators were calculated based on data provided by the Bank of Russia (Bank of Russia, 2023).

The key variable of the study is EC, representing the level of e-commerce development. Given that e-commerce is based on Internet technologies, the level of Internet penetration is considered a proxy variable for EC. Internet penetration data were collected from the World Bank database (World Bank Group, 2018). These data reflect the number of Internet users per 100 people in each country, which allows us to assess the extent to which people and businesses have access to Internet technology.

The distance between Russia and the BRICS countries, important for analysis in the context of the gravity trade model, was obtained from geographic databases. The main variables are described in Table 1.

Table 1. Variables used in the model

Variable	Description
<i>EC</i>	Number of Internet users per 100 people
<i>GDP</i>	GDP of the country, USD
<i>POP</i>	Population of the country, people
<i>REX</i>	Ruble exchange rate
<i>CB</i>	Presence of a common border between Russia and one of the BRICS countries
<i>DISTANCE</i>	Distance between Moscow and one and BRICS countries

Model Checking and Estimation

Multicollinearity test

To determine whether multicollinearity exists between the variables in model (1), the correlation matrix shown in Table 2 was constructed.

Table 2. Correlation coefficients between independent variables

	<i>lnGDP</i>	<i>lnPOP</i>	<i>lnEC</i>	<i>lnREX</i>	<i>CB</i>	<i>lnDISTANCE</i>
<i>lnGDP</i>	1	0,5741	0,6062	0,1697	0,5070	-0,3290
<i>lnPOP</i>	0,5741	1	-0,0880	-0,4048	0,5575	-0,6663
<i>lnEC</i>	0,6062	-0,0880	1	0,3852	0,0538	0,2133
<i>lnREX</i>	0,1697	-0,4048	0,3852	1	0,1796	0,6806
<i>CB</i>	0,5070	0,5575	0,0538	0,1796	1	-0,3425
<i>lnDISTANCE</i>	-0,3290	-0,6663	0,2133	0,6806	-0,3425	1

The table shows that all the correlation coefficients between different variables are less than 0.7, so there is no obvious multicollinearity between the variables.

Unit root test

We conducted a unit root test for the variables used in the model, which includes LLC-test and IPS-test. The null hypothesis is that the series is non-stationary and the alternative hypothesis is that the series is stationary. The lag order was determined using the Schwartz information criterion. The results of the test are shown in Table 3.

Table 3. Results of the unit root test

Variable	LLC-test		IPS-test	
	Levels	1 st differences	Levels	1 st differences
<i>lnTRADE</i>	-1,82**	-5,30***	0,08	-5,10***
<i>lnGDP</i>	-3,60***	-5,14***	-1,53	-3,51***
<i>lnEC</i>	-7,12***	-2,51***	-5,63***	-2,38***
<i>lnPOP</i>	-2,01**	-2,38***	0,63	-2,00**
<i>lnREX</i>	-0,69	-3,75***	-0,24	-4,52***

Note: ***, **, *, * denote 1% and 5% significance levels, respectively.

The null hypothesis is rejected for the *lnEC* series at the 1% significance level. The *lnTRADE*, *lnGDP*, *lnPOP*, *lnREX* series are 1st order integrated, while the *lnEC* series is zero order integrated.

Cointegration test

In our study, we used Johansen test to detect cointegration among variables, which includes two approaches: trace test and max-eigen test. We tested whether the number of cointegrating equations is less than a given number ‘*r*’ without considering the constant and trend. The alternative hypotheses were that the number is not less than ‘*r*’ (trace test) or equal to ‘*r*+1’ (max-eigen test). The results of our test led to rejection of the null hypothesis for all values of ‘*r*’ from zero to four as indicated in Table 4. This implies significance of at least four cointegration equations at 1% significance level. Hence, the estimates of the levels of variables in our model are robust.

Table 4. Cointegration test results

Number of cointegration equations	Trace test		Max-eigen test	
	F-statistics	p-value	F- statistics	p-value
None	135,6	0,00	66,09	0,00
At most 1	87,44	0,00	40,01	0,00
At most 2	56,63	0,00	24,25	0,00
At most 3	40,67	0,00	25,71	0,00
At most 4	26,12	0,00	26,12	0,00

Extended model

To account for the impact of the crisis on trade between Russia and the BRICS countries, model (1) was augmented with a dummy variable D , which is equal to one in 2008, 2009, 2015, 2020 and 2022 and zero otherwise. Dummy interaction variables were also added to the new regression: $D * \ln(\text{GDP}_{it}/\text{GDP}_{jt})$, $D * \ln(\text{EC}_{it}/\text{EC}_{jt})$, $D * \ln(\text{POP}_{it}/\text{POP}_{jt})$ and $D * \ln(\text{REX}_{ijt})$. The obtained model (2) looks as follows:

$$\begin{aligned} \ln(\text{TRADE}_{ijt}) = & \beta_0 + \beta_1 \ln(\text{GDP}_{it}/\text{GDP}_{jt}) + \beta_2 \ln(\text{EC}_{it}/\text{EC}_{jt}) + \beta_3 \ln(\text{POP}_{it}/\text{POP}_{jt}) + \\ & + \beta_4 \ln(\text{REX}_{ijt}) + \beta_5 \text{CB}_{ijt} + \beta_6 \ln \text{DISTANCE}_{ijt} + \beta_7 D + \beta_8 D * \ln(\text{GDP}_{it}/\text{GDP}_{jt}) + \\ & + \beta_9 D * \ln(\text{EC}_{it}/\text{EC}_{jt}) + \beta_{10} D * \ln(\text{POP}_{it}/\text{POP}_{jt}) + \beta_{11} D * \ln(\text{REX}_{ijt}) + \mu_i + \varepsilon_{it} \end{aligned} \quad (2)$$

To choose between Pooled least squares and fixed effects regression for models (1) and (2), the Breusch-Pagan test was performed, and the results in both cases favor the first regression estimation method. The results of model estimation are shown in Table 5.

Table 5. Results of estimation of models (1) and (2)

Regressors	(1) Pooled least squares	(2) Pooled least squares
CONST	-80,3423*** (14,2939)	-72,6382*** (13,3786)
ln GDP	0,4409*** (0,0878)	0,3075*** (0,0957)
ln EC	0,1391* (0,0712)	0,1919*** (0,0697)
ln POP	1,3059*** (0,1969)	1,3684*** (0,1809)
ln REX	-0,3746* (0,1916)	-0,2235 (0,1847)
CB	1,0809*** (0,2706)	1,0160*** (0,2434)
ln DISTANCE	3,0498*** (0,9082)	2,6868*** (0,8514)
AR(1)	0,6907*** (0,0887)	0,6701*** (0,0903)
D		-6,6624** (2,7894)
D * ln GDP		0,401*** (0,1311)
D * ln EC		-0,1025** (0,0503)
D * ln POP		-0,3841*** (0,1266)
D * ln REX		-0,2642*** (0,0802)
R ²	0,9869	0,9885
F-statistics	936,7994	624,2867

Note: ***, **, *, * denote 1%, 5%, and 10% significance levels, respectively.

In both models the EC variable is significant, F-statistics show that the equations as a whole are also significant. The extended regression gives more accurate results because the dummy variables related to the crisis were found to be significant.

Model (2) shows that a 1% increase in the number of Internet users among Russia and its trading partners among the BRICS countries increases trade turnover by 0.19%.

Discussion

The results of this study provide evidence of the significant impact of digitalization on international trade, specifically highlighting the role of e-commerce in enhancing trade turnover between Russia and its BRICS trading partners. A noteworthy finding is that a 1% increase in the number of Internet users among these countries corresponds to a 0.19% increase in trade turnover. This underscores the importance of digital connectivity in facilitating cross-border trade and supports the notion that e-commerce is an important driver of international trade dynamics.

Comparing the results of this study with prior research reveals some interesting insights. For instance, He Y. and Wang J.'s analysis of ASEAN countries, utilizing data from 1996 to 2016, highlights the significance of GDP and real exchange rate on cross-border e-commerce (He & Wang, 2019). In contrast, this study emphasizes the impact of Internet penetration on trade turnover, suggesting that while economic factors are crucial, digitalization is equally important in facilitating trade relationship.

Wang C. and co-authors' study (Wang et al., 2021), which employs the gravity trade model to analyze China's exports, demonstrates a significant impact of cross-border e-commerce on China's export performance. Specifically, their results indicate that a 1% increase in the number of Internet users among China and its trading partners leads to a 0.28% increase in China's export volume. Their research complements our study, as it examines the issue from the perspective of China, providing a valuable comparison point and further insights into the role of digitalization in international trade dynamics.

On the other hand, Yin Z. and Choi C.'s research (Yin & Choi, 2023) sheds light on the sector-specific impacts of cross-border e-commerce. Their analysis, using a gravity model to examine China's exports to Belt and Road Initiative countries, reveals that cross-border e-commerce has a stronger positive impact on trade in services than on trade in goods. This finding complements our study by suggesting that the benefits of digitalization and e-commerce may vary across different sectors of the economy.

Additionally, this study incorporates dummy variables indicating the presence of a common border and crisis dummy variables, which adds a layer of complexity to the analysis. These variables help to account for geopolitical and economic events that could influence trade patterns, providing a more nuanced understanding of the factors driving international trade turnover. This distinction underscores the importance

of considering a variety of factors, both economic and non-economic, in understanding the dynamics of cross-border e-commerce and international trade.

However, the database used to build the econometric model in my research includes indicators for the BRICS countries but does not sufficiently reveal the specifics of the impact of e-commerce on trade turnover between Russia and China. In further research, we plan to refine the model using modern quarterly data to obtain more relevant results. This data can be obtained from national statistical authorities, taking into account the limitations of open access, to analyze the dynamics of trade turnover of the countries under consideration more accurately, as international statistics often publish data with a significant time lag.

Conclusion

The study confirmed the significant impact of e-commerce on international trade turnover between Russia and China. E-commerce is demonstrating dynamic growth in both B2C and B2B segments, significantly expanding the boundaries of international trade and providing new opportunities for businesses and consumers.

Contemporary challenges such as the COVID-19 pandemic and rapid development of information technology have become catalysts for accelerating the digitalization of trade processes and the increasing role of e-commerce in international economic relations. These factors have contributed to rethinking and adapting trade strategies, and have spurred innovation in digital platforms and logistics.

The dynamics of e-commerce and cross-border commerce development in Russia and China have shown differences caused, among other things, by the degree of rigidity of covid restrictions and different scales of national markets. These differences point to utmost importance of taking into account national peculiarities and flexibility of the regulatory environment for the development of e-commerce.

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