

# **Analysis of Sino-Russia-Magnolia Trade Cooperation Potential: Based on the Perspective of Trade Gravity Model**

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**Keywords:** Sino-Russia-Magnolia, Trade Gravity Model, Trade Potential

**Abstract.** This paper sets the three bilateral trade flows (1999-2014) as the basis of analysis and adds trade system arrangement policy variable within the classical trade gravity model. It also constructs the panel data model of three bilateral trade between China, Russia and Mongolia. The empirical results show that (1) China and Russia bilateral trade increase apparently; China and Mongolia have a coordinated growth of bilateral trade; Russia and Mongolia maintain an uneven development of bilateral trade. (2) The three bilateral trade flows are largely driven by economies of scale, the relative distance and trade relationship. (3) Sino-Russia and Sino-Mongolia's bilateral trade belong to trade potential pioneering type and there is still a transaction gap which should be dug deeply. Russia-Mongolia's trade is close to the huge potential type, especially the Mongolia exports to Russia.

## **1. Introduction**

On July 9, 2015, President, XI Jinping held meeting with Russia President Vladimir Putin and Mongolian President Elbegdorj in Ufa. <A Road Map of Tripartite Cooperation in the Medium-Term > approved by the three heads proposed to strengthen the tripartite trade, investment and business partnerships. This work tries to describe the bilateral trade situation, the driving factors and the trade potentialities in the future.

## **2. Analysis of Sino-Russia-Magnolia Bilateral Trade Situation**

From Figure 1, the Sino-Russia bilateral trade volume had an increase of 21 times, leading a growth trend. Russia's exports to China is mainly original, timber and other resources intensive products. China's exports to Russia's is primarily electrical main textile, light industry, toys and etc. Figure 2 reveals Sino-Mongolia bilateral trade had an increase of 33 times which grew from U.S. \$ 2.13 million to U.S. \$ 72.86 million. Sino-Mongolia trade experienced transitions in 2001 for China to Mongolia's exports declined, but Mongolia to China's export surged. China largely exported to Mongolia manufactured goods and articles for daily use whereas Mongolia generally exported minerals, animal products and textiles to China. Regional trade is in a state of with low value-added and low-end products. From Figure 3, Russia and Mongolia bilateral trade volume is small and Russia is in a dominant position. Mongolia's exports climbed next to 12 times in 15 years, but Mongolia to Russia's export volume has been low. Russia's high tariffs on Mongolian goods and the improvement of Russian railway freight are the bottleneck restricting the development of Russian trade rapidly.

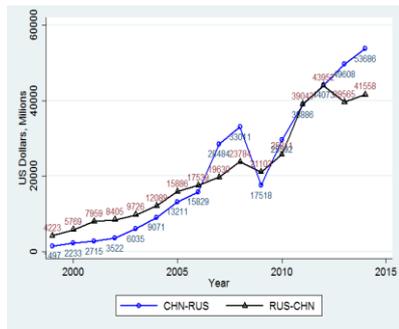


Fig.1. China and Russia Trade Trends (1999-2014)

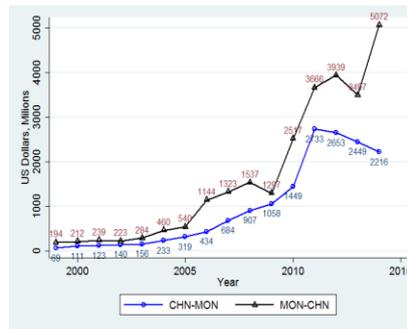


Fig.2. China and Mongolia Trade Trends (1999-2014)

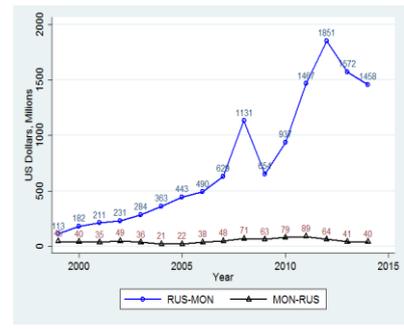


Fig.3. Russia and Mongolia Trade Trends (1999-2014)

### 3. Model Specification and Data Source Descriptions

**3.1 Model Specification.** Earliest trade gravity model merely considers the economic aggregate and the distance. The consequent research results widened the determinants of bilateral trade. These variables contain population size[1], per capital gross domestic product[2], exchange rate[3]. Whether to belong to an economic organization[4] as well as the different meanings of virtual variables are introduced into the analysis. This paper uses the trade gravity model general form as follows:

$$\ln T_{ijt} = \ln A + \beta \ln(Y_{it}Y_{jt}) + \gamma \ln D_{ij} + \delta S_{ijt} + \varepsilon_{ijt} \quad (1)$$

### 3.2 Data Source Descriptions

Table 1. Data Sources and Description

Variable (Meaning)	Source
$T_{ijt}$ (trade flows of country i export to j in t period)	International monetary fund database
$Y_{it}/Y_{jt}$ (gross domestic product of country i and j in t period)	world-development-indicators
$D_{ijt}$ (relative distance between country i and j)	Indonesian Website

Data sources: the author sorted.

Table 2. Virtual Variable Description

Variable (Meaning)	Important Point	Specific Set
$S_{ijt}$ (On behalf of the institutional arrangement in favour of trade between the two countries)	In 2003, China and Russia agreed to strengthen and develop good-neighborly friendship and strategic partnership of coordination between the two countries	China and Russia before 2003 sets to 0, after 2003 (including 2003) sets to 1
	2003 years as the two countries enacted the good-neighborly partnership of mutual trust, bilateral relations entered into a new stage of development	China and Mongolia before 2003 set to 0 (including 2003) after 3 years to 1
	Mongolian President Nambaryn Enkhbayar visited Russia in 2006, the two sides signed the <Declaration of Moscow>, Mongolia-Russian relations entered a stage of full recovery	Mongolia and Russia sets to 0 before 2006, the indicator of the two countries after six years (2006) sets to 1

Data sources: the author sorted.

### 4. Empirical Analysis

This work has carried on the Hausman test and panel regression analysis by using STATA 14.0 software on sample data.

**4.1 Hausman Test.** Table 2 shows that all three models declined the Hausman test null hypothesis. The results refuse the original hypothesis. That means a random effects model must be taken into the analysis.

Table 3. Hausmann Test Results

Test: Ho: difference in coefficients not systematic	
Sino-Russia Trade Model	Prob>chi2=0.3100
Sino-Mongolia Trade Model	Prob>chi2=0.9997
Russian-Mongolia Trade Model	Prob>chi2=0.1899

Data Sources: calculated by the author.

**4.2 Regression Results.** This work adopts random effects model. The estimations are shown in table 3.

Table 4. Panel Regression Results of Sino-Russia-Mongolia Gravity Model of Bilateral Trade

	Lnexportij(China-Russia)	Lnexportij(China-Mongolia)	Lnexportij(Russia-Mongolia)
lngdp	0.466 (8.56)***	0.669 (26.32)***	0.336 (3.27)***
Indistr	0.2 (2.84)*	0.087 (10.24)**	-0.454 (15.74)***
scij	0.336 (-1.89)***	0.129 (-1.35)*	0.43 -1.27
_cons	-19.283 (7.03)***	-28.214 (22.84)***	-7.928 (-1.61)*
N	32	32	32

Notes: \* p<0.1; \*\* p<0.05; \*\*\* p<0.01, Z value in brackets.

Continuous variable coefficient of the natural logarithm (such as Y and D ) expresses elastic[7]. But virtual variables (such as  $S_{ijt}$ ) coefficient need to be interpreted as elastic after conversion:  $E = \exp(\delta) - 1$  [8],  $\delta_{ij}$  is an estimated coefficient for a virtual variable[9].

Regression results reflect three aspects. Firstly, the three bilateral regression coefficients of GDP is positive significant at 1% level[10]. Second, the influence of the relative distance passes the test of significance. The coefficient of relative distance between China and Russia reaches 0.2, which demonstrates that the two countries in the world production capacity are reinforced and weak the actual distance factor. Third, in virtual variable inspection, China-Russia trade institutional arrangements' significance level is remarkably high.

**4.3 Potential analysis of Bilateral Trade.** Gravity model of trade potential is based on estimates of potential trade, then compares the potential value with the actual trade volume[11]. Provided that the actual trade value is greater than the estimate, the condition is called excessive trading subsequently. Trade potential values fall into three categories by 0.8 and 1.2 standards. The first class is a potential type which quantity is greater than or else equal to 1.2. The second category is between 0.8 and 1.2 and the third type is less than 0.8. Figure 4 shows the potential of China-Russia-Mongolia's bilateral trade.

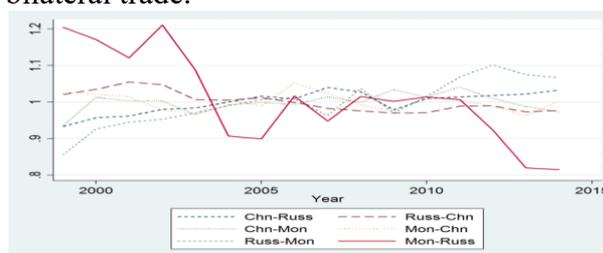


Fig.4. Bilateral Trade Potential between China, Russia and Mongolia

## 5. Conclusion

This paper adds trade system arrangement policy variable within the classical trade gravity model and constructs the panel data model of three bilateral trade between China, Russia and Mongolia. It

adopts the three bilateral export trade flows as the research object, discussing the influential factors of affecting trade flows and predicts the potential trade meanwhile. Calculation of trade potential shows the strategic arrangement of regional economic integration between Sino-Russia-Mongolia can effectively release the commercial potential.

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