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Master's Thesis of Public Administration

**Mongolia's pattern of Trade with Northeast
Asian countries:
The Gravity Model Approach**

**몽골의 동북아 국가와의
무역 유형에 관한 연구**

: Gravity 모형 접근법

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Mongolia's pattern of Trade with Northeast Asian countries: The Gravity Model Approach

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Abstract

Mongolia's pattern of Trade with Northeast Asian countries:

The Gravity Model Approach

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The research study investigates Mongolia's trade scenario with its trading partners and seeks to find out the opportunities to boost Mongolian export towards foreign markets, namely the countries in the Northeast Asia region.

The first two chapters of the thesis contain information on country's economic background and research objectives, and following two chapters describe an overview on Mongolia's trade scenarios. Last two chapters conduct the empirical analysis on Mongolia's trade performances with its major trading partners to explain the opportunities for Mongolia's trade scenario. For this purpose, the "Gravity model" is used to empirically

explain that if Mongolia's trade is determined or affected by gravity model factors. Trade dynamic data of 12 selected countries for period of 13 years (2001-2013) have been used for the calculation by E Views 7 program.

Last chapter concludes the outcome of the research analysis and makes recommendations for policy implications based on the research findings.

Key words: International trade; Mongolia's export; trading partners; gravity model; Northeast Asia region.

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Chapter I. Introduction

1.1. Background

Mongolia is a landlocked country in North East Asia, covering 1,564,100 square kilometers, the eighteenth largest country in the world by area. The population is relatively small and young amounting 2.9 million people, with almost two thirds of the total under the age of 35.

Mongolia is over a decade-long democracy in the heart of Central Asia, surrounded by Russia and China. Since its transition to democracy and market economy in 1990, Mongolia has been striving to strengthen the progress achieved in economy and social life. Thanks to appropriate measures taken by the Government, today Mongolia has become one of the open economies with a liberal trade regime. (See below table).

Table 1.1. Mongolia's tariffs and duties

| Tariffs and duty free imports | | |
|--------------------------------------|-------------|--------------|
| MFN tariffs | Final bound | Applied 2014 |
| Simple average of import duties | | |
| Agricultural goods (AOA) | 18.9 | 5.1 |
| Non-agricultural goods | 17.3 | 5.0 |

Mongolia joined the World Trade Organization in 1997, will have equal rights to trade with many countries of the world wide, was contribute to the decision making in their global trade and economic cooperation.

By becoming the Member of the WTO, Mongolia has chosen the path of multilateral trading system and made its principles the engine for development. Mongolia's foreign trade turnover 92.3% to compared with GDP in 2013. This shows that the country's economy is still heavily depend upon external trade. Therefore, it is important for the country like Mongolia landlocked in -between the two giant states, to correctly identify and accurately implement trade policy. The choice of multilateral trading system and its principles, on the basis of which the pursuance of a more liberal trade policy in general has had positive reflection on the economy.

(Toim 2013)

The total trade turnover of the country accounted for US\$10,627 million in 2013, that is compared to that of 2005 the increase by 4.7 times. Although the total trade turnover has steadily been increasing, trade remains in deficit for the whole period except for 2006. For instance, trade deficit in 2007 accounted for US\$ 221 million, in 2013 US\$ 2,082 million and which compared to the 2007 increased by 9.4 times. (Mongolia's Trade Policy Government Report 2014)

The reasons lying behind the increase of trade deficit over years, on the one hand trade dependency on few export commodities, high percentage

of raw materials in exports, heavy dependency of these raw materials on world market prices caused the trade deficit, on the other hand due to investment, there are significant increase of importation of equipment and machinery and mechanism.

Mongolia's macro-economic framework for 2011 looked extremely positive: a GDP growth rate reached its peak of 17.4 % in 2011 and it is expected to be at 13,0 % in 2014. The inflation is maintained at 11%. The Mongolian government aims to consolidate stable, private sector-led economic growth, and democratic achievements.

Mining, information technology, agricultural, infrastructure, tourism have been identified by the Government as priority sectors for development and FDI. The imports of some equipment and heavy machinery in these sectors enjoyed customs and VAT tax exemption.

The Government considers FDI as an important thrust in the economic development of the country. In reaching its objective to ensure a 6% annual economic growth, the Government in its Action Program stated to create an environment that protects FDI. Mongolia currently trades with more than 120 countries. Mongolia has bilateral trade, economic cooperation and investment promotion agreements: with more than 40 countries, incl. Russia, China, ROK and Japan. Mongolia is included in the EU GSP+ scheme, where 7,200 items (HS) are exempted from customs tariff. But, it will expire in 2014; But, Mongolia is not yet a part

to any regional or bilateral free trade agreements (FTA). (Mongolia's Trade Policy Government Report 2014)

1.2. Purpose of research

Trade can help boost development and reduce poverty by generating growth through increased commercial opportunities and investment, as well as broadening the productive base through private sector development. Mongolia is a developing country, therefore I do believe that, today, it is essential for Mongolia to pay extra attention to its trade, which is the main source of economic development. Trade enhances competitiveness by helping developing countries reduce the cost of inputs, acquire finance through investments, increase the value added of their products and move up the global value chain. I also do believe that trade openness expands business opportunities for local companies by opening up new markets, removing unnecessary barriers and making it easier for them to export for Mongolia.

In case of Mongolia, as landlocked country, therefore it is important to make research study on trade with its major trading partner countries. By doing the present research analysis, I would like to find out whether Mongolia can boost trade with Northeast Asian countries and what factors positively and negatively influence for the trade growth, and also to find out the existing constraints that Mongolia's trade faces. Based on my research findings, I would like to make proposals and recommendations

for further policy implications to boost Mongolia's trade with its trading partners, namely in Northeast Asia. The above questions will be answered or can be explained by conducting the empiric analysis using the gravity model.

The main objective of this research was to find out the existing problems or issues of Mongolia's trade with its neighboring countries, the issues that reduce the income level and the problems of high number of expenses that causes during bilateral trade for Mongolia. The research focused on finding the trade opportunities for Mongolia with its best trading countries including Northeast Asian countries using Gravity Model with the help of E-views 7 program. Therefore my research paper will be based on the understanding of empiric, quantitative and qualitative methods in order to conduct my research.

1.3. Research questions

The topic of the research is on International trade, in particular on Mongolia trade relations with its trading partners in Northeast Asia. As the research questions and guidelines, I am going to conduct my research to answer the following questions.

- a. What are key factors that positively and negatively influence to growth of Mongolia's foreign trade?

- b. Beside neighboring countries, which countries would be a potential markets for Mongolia's export?
- c. What are priority issues of further policy implications in order to expand Mongolia's trade with partner countries?

1.4. Significance of the study

First, I consider that significance of my research is lies in conducting empirical researches on the Mongolia's trade performances to prove my early predictions and hypothesis based on the reliable statistical data.

Second, Mongolia still lacks proper empirical studies due to national capacity, therefore, I believe that findings of my research analysis can be used as a solid background analysis for the government to pursue its trade policy measures towards Northeast Asia region.

Third, this research findings and recommendations will provide an excellent policy guides to many groups in Mongolia including government, NGOs and specifically for the trade promotion institutions that will help to improve their trade implications in order to maintain sustainable trade with its trading partner countries.

Finally this research findings and recommendations are helpful for private community and professional associations to diversify their market, and recommend them the opportunities and best options for trade.

1.5 The structure of the study

This research paper consists of six chapters.

The first chapter contains background introduction information. It also describes the research purpose, questions and structure of the thesis etc.

Second chapter focuses on country's economic background information, as well as overview on Mongolia's trade scenarios and its performances with major trading partners. Third chapter describes the research methodology and data collection for conducting the quantitative analysis.

Fourth chapter is studies on Mongolia's bilateral trade with major trading partner countries. Fifth chapter conducts the empirical analysis on Mongolia's trade performances with its major trading partners in order to explain the factors and find out the opportunities for Mongolia's trade scenario.

For this purpose, the "Gravity model" is used to empirically explain that if Mongolia's trade is determined or affected by gravity model factors. Trade dynamic data of 12 selected countries for period of 13 years (2001-2013) have been used for the calculation by E Views 7 program. Last chapter concludes the outcome of the research analysis and makes

recommendations for policy implications based on the research findings.

Chapter II. Framework of the study

2.1. Theory of International Trade

Theory of international trade: International trade is the exchange of capital, goods, and services across international borders or territories. In most countries, such trade represents a significant share of gross domestic product (GDP). Therefore, the international trade is considered as the larger branch of international economics. International trade is, in principle, not different from domestic trade as the motivation and the behavior of parties involved in a trade do not change fundamentally regardless of whether trade is across a border or not. The main difference is that international trade is typically more costly than domestic trade. The reason is that a border typically imposes additional costs such as tariffs, time costs due to border delays and costs associated with country differences such as language, the legal system or culture. International trade is the exchange of capital, goods, and services across international borders or territories. In most countries, such trade represents a significant share of gross domestic product (GDP). Therefore, the international trade is considered as the larger branch of international economics. (ITTE 1994).

International trade is, in principle, not different from domestic trade as the motivation and the behavior of parties involved in a trade do not change fundamentally regardless of whether trade is across a border or not. The main difference is that international trade is typically more costly than

domestic trade. The reason is that a border typically imposes additional costs such as tariffs, time costs due to border delays and costs associated with country differences such as language, the legal system or culture.

Another difference between domestic and international trade is that factors of production such as capital and labor are typically more mobile within a country than across countries. Thus international trade is mostly restricted to trade in goods and services, and only to a lesser extent to trade in capital, labor or other factors of production. Trade in goods and services can serve as a substitute for trade in factors of production. (FTFA 2005).

Instead of importing a factor of production, a country can import goods that make intensive use of that factor of production and thus embody it. An example is the import of labor-intensive goods by the United States from China. Instead of importing Chinese labor, the United States imports goods that were produced with Chinese labor. One report in 2010 suggested that international trade was increased when a country hosted a network of immigrants, but the trade effect was weakened when the immigrants became assimilated into their new country.

Adam Smith's model: Adam Smith displays trade-taking place on the basis of countries exercising absolute advantage over one another.

Ricardian model: The law of comparative advantage was first proposed by David Ricardo. The Ricardian model focuses on comparative advantage, which arises due to differences in technology or natural

resources. Comparative advantage refers to the ability of a person or a country to produce a particular good or service at a lower marginal and opportunity cost over another. Comparative advantage was first described by David Ricardo who explained it in his 1817 book “*On the Principles of Political Economy and Taxation*” in an example involving England and Portugal. In Portugal it is possible to produce both wine and cloth with less labor than it would take to produce the same quantities in England. (Economics 1817).

The Ricardian model does not directly consider factor endowments, such as the relative amounts of labor and capital within a country. The Ricardian model is based on the following assumptions: Labor is the only primary input to production; and the relative ratios of labor at which the production of one good can be traded off for another differ between countries and governments.

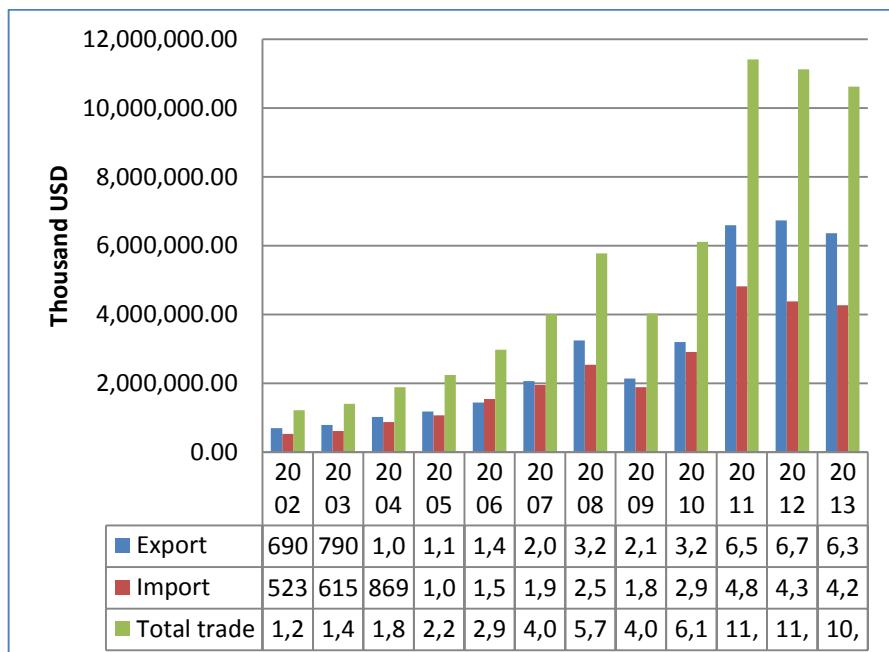
Heckscher–Ohlin model: Additionally, owners of opposing specific factors of production (i.e., labor and capital) are likely to have opposing agendas when lobbying for controls over immigration of labor. Conversely, both owners of capital and labor profit in real terms from an increase in the capital endowment. This model is ideal for understanding income distribution but awkward for discussing the patte. (Princeton 2010).

2.2. Background on Mongolia’s Foreign Trade

Foreign trade plays a crucial role in the Mongolian economy, with the value of foreign trade turnover almost equaling the country's GDP.

Mongolia has bilateral trade, economic cooperation and investment agreements with more than 40 countries, including Russia, China, USA, EU, South Korea and Japan etc. In addition, Mongolia is included in the GSP scheme (Generalized System of Preferences) of Japan, the USA and Canada, under which duty free entry is provided for goods and products.

Figure 2.1. – Mongolia's Foreign Trade (2002-2013)



Source: Mongolia Customs office

Figure 2.2. – Mongolian EXPORT by countries (2013)

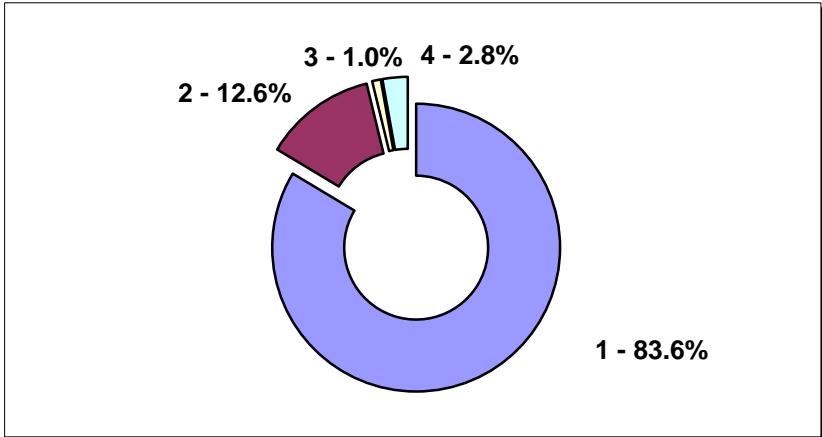
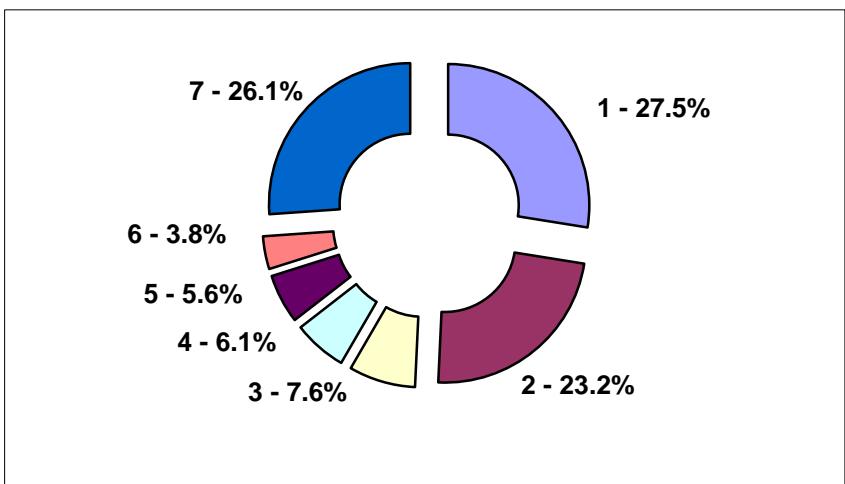


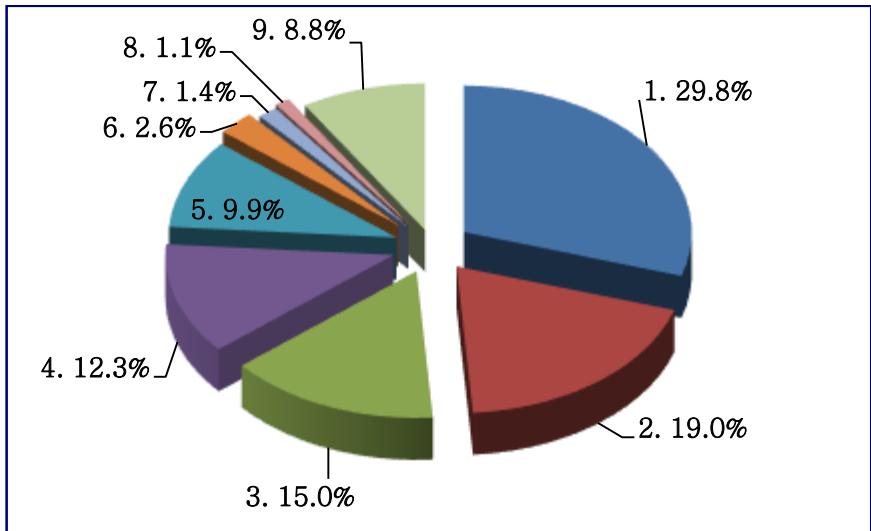
Figure 2.3. – Mongolian IMPORT by countries (2013)



| | | |
|---------------------------------|------------------|--------|
| <i>Japan</i> | 25707.71221 | 7.6% |
| <i>United States of America</i> | 20646.77367 | 6.1% |
| <i>Republic of Korea</i> | 18974.51491 | 5.6% |
| <i>Malaysia</i> | 12677.34537 | 3.8% |
| <i>Other</i> | 88,025.6 | 26.1% |
| | 337,080.1 | 100.0% |

Foreign trade plays an important part in Mongolia's economy. Since acceding to the World Trade Organization in 1997, Mongolia has substantially liberalized its trade regime. This liberalization has involved the reduction of tariff rates and elimination of a number of import licensing requirements. Mongolia's overall trade policy objectives are to support economic growth through an effective trade policy, promote the industrial, agricultural and services sectors and increase exports. More than 80% of our total trade accounts for trade with the Russian Federation and the PR of China. (MFT 2012).

Figure 2.4. – Mongolia EXPORT by PRODUCTS (2013)

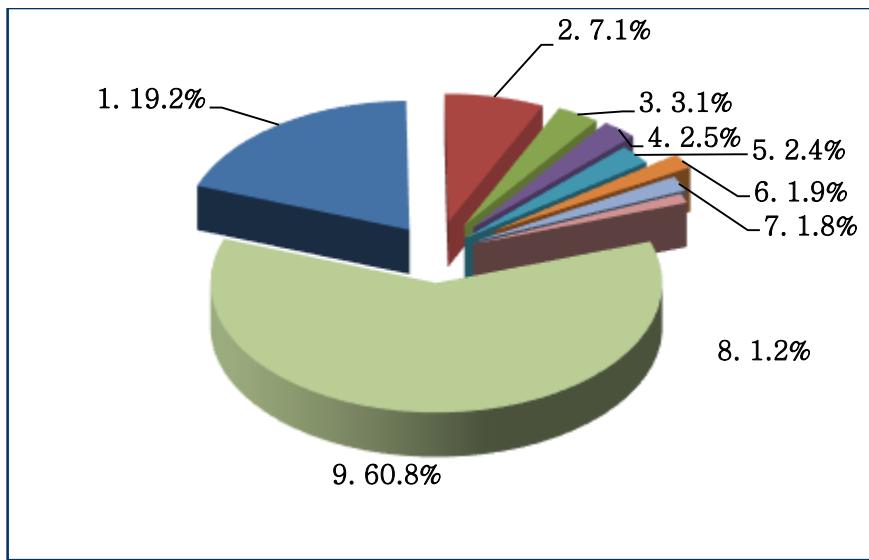


| | | |
|--------------------------------|------------|-------|
| 1 - Copper concentrates | 95796.8768 | 29.8% |
| 2 - Coal | 61144.7315 | 19.0% |
| 3 - Crude oil | 48249.0461 | 15.0% |
| 4 - Gold | 39481.6 | 12.3% |
| 5 - Iron ores and concentrates | 31663.1199 | 9.9% |
| 6 - Zinc ores and concentrates | 8494.4613 | 2.6% |
| 7 - Lucite; | 4599.55988 | 1.4% |
| 8 - Goat or kidskin leather | 3435.12427 | 1.1% |
| 9 - Other | 28,363.3 | 8.8% |

Mongolian exports are composed of few items, namely minerals such as copper, molybdenum and fluorspar concentrates and gold, textiles and animal originated raw materials such as wool, cashmere, hides and skins, meat and intestines. Minerals and textiles account for more than 60% of total exports. The country's main export destinations are the China, USA, EU, Russia, Japan and South Korea. Mongolian export items enjoy

preferential tariffs under the GSP schemes of the USA, EU, Canada, Japan and Russia. (Toim 2013).

Figure 2.5. – Mongolian IMPORT by PRODUCTS (2013)



| | | |
|--|--------------------|--------------|
| 1 - Petroleum products. | 64735.30021 | 19.2% |
| Motorcars and other motor vehicles | | |
| 2 - principally designed for the transport of persons. | 24077.96452 | 7.1% |
| 3 - Motor vehicles for the transport of goods. | 10281.3323 | 3.1% |
| 4 - Self-propelled bulldozers, angle dozers, graders, levelers, scrapers, mechanical shovels, excavators, tamping machines and road rollers. | 8592.752717 | 2.5% |
| 5 - New tires. | 8163.229258 | 2.4% |
| 6 - Electrical apparatus for line telephony or line telegraphy. | 6267.759702 | 1.9% |
| 7 - Bread, pastry, cakes and biscuits. | 6214.755929 | 1.8% |

| | | | |
|------------------|--|-------------|---------------|
| 8 - | Parts suitable for use solely or principally with the machinery. | 3914.069859 | 1.2% |
| 9 - | Others | 204,832.97 | 60.8% |
| 337,080.1 | | | 100.0% |

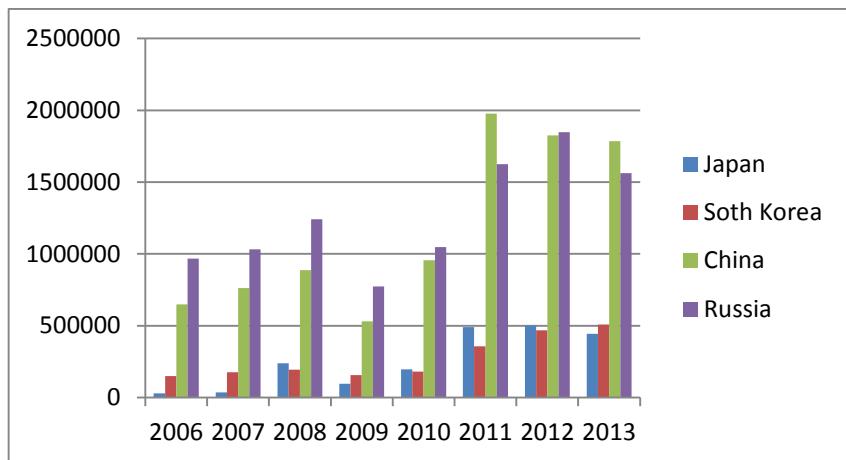
Mongolian imports are composed of following items, such as machineries, equipment, petroleum products, electronics and consumer goods. The country's main imports come from Russia, China, South Korea, Japan and USA.

2.3. Overview on Mongolia's trade with Northeast Asian countries

Northeast Asian countries have a large presence in Mongolia's foreign trade activities. My research investigates developments in Mongolia foreign trade with these countries in terms of overall trends, structure, and main export commodities. Although the Mongolian government has consistently promoted an export-led growth policy for a more than decade, the dominance of raw and low-value added products within its exports means that the country is unable to escape prolonged foreign trade deficit that is undermining the potential of foreign trade to act as the country's growth engine. The overall structure of the foreign did not change much over the period of 1990-2010. Exports remain dominated by low value added mineral products and products of animal livestock origin, whereas imports comprise a wide range of high value added manufacturing, food and industrial products. (MFT 2012)

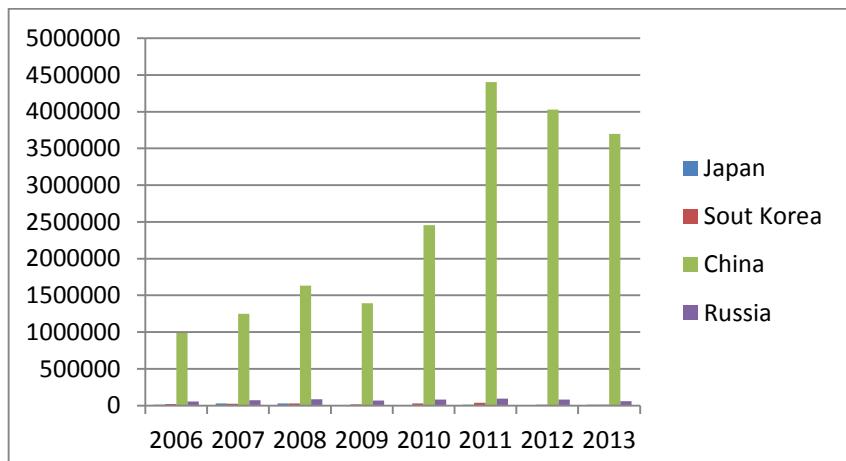
Figure 2.6. – Mongolia’s IMPORT by Northeast Asian countries (2006-2013)

(*Thousand USD*)



Source: Mongolia Customs Office

Figure 2.7. – Mongolia’s EXPORT by Northeast Asian countries (2006-2013)



Source: Mongolia customs office

2.4. Northeast Asia and Economic Integration

There has been a veritable explosion of regional trade agreements ('RTAs') in the last 15 years or so. Nearly every country in the world became a member of one or more RTAs¹. The exception was Northeast Asia. But, as China, Japan, and Korea move toward regionalism, discarding their single track approach, the East Asian region is expected to become a web of multiple RTAs in the upcoming decade. The WTO Agreement establishes certain rules for regionalism that help realize the 'building bloc' idea. These rules can be summarized as the external, internal, and procedural requirement. It is true that some of these requirements are quite vaguely expressed and that application of these rules has been loose. As a result, *de facto* ignorance of GATT discipline and the phenomenon of the spread of 'partial' RTAs have developed. Hence, in order for regionalism to play a truly complementary role for multilateralism, those rules ought to be clarified and observed. It should not be forgotten that the main beneficiary of WTO consistent integration in East Asia would be none other than the East Asians themselves. (FTAA. ADB 2012).

Japan, China and South Korea EPA

The China–Japan–South Korea Free Trade Agreement is a proposed free trade agreement between China, Japan and South Korea. Negotiations on the agreement were set in motion in 2012. The first official talks on the

matter were held in Seoul from 26–28 March 2013. Further talks were held in China and Japan throughout 2013, and more were scheduled for early 2014. Trade among the three economies totaled US\$690 billion in 2011; however, progress on negotiations may be hampered by ongoing territorial disputes among the participants. (Toim 2013).

The three nations are major traders, and together accounted for 19.6 percent of the world's economy and 18.5 percent of its exports in 2010, according to a feasibility study of the proposed trade pact that the governments issued late last year.

Graphic 2.1. - THE MAP OF NORTHEAST ASIA



China is the biggest trade partner of both Japan and South Korea. A free trade treaty could lift China's GDP by up to 2.9 percent, Japan's by 0.5

percent, and South Korea's by 3.1 percent, China's official Xinhua news agency said, without citing the basis for the estimates.

Russia and China trade relations.

Today, China-Russian relations stand at an unprecedented height driven by trade and energy cooperation. While trade reached a record high of 88 billion U.S. dollars in 2012, the two countries plan to raise the volume to 100 billion dollars by 2015 and 200 billion dollars by 2020.

In October 2013, Russian Premier Medvedev and Chinese Premier Li Keqiang co-chaired the 18th regular meeting of heads of government. They also witnessed the signing of an array of documents. According to an agreement signed on Tuesday, Russia's biggest oil company Rosneft will supply an additional 10 million tons of crude oil to China each year over the next 10 years.

The two countries will also construct a joint-venture oil refinery in Tianjin, which will be able to process 16 million tons of crude oil each year. China National Petroleum Corporation (CNPC), the country's largest oil and gas producer and supplier will hold a 49 percent stake and Rosneft the remaining 51 percent, he added.

Chinese companies have begun developing the Russian Far East and both sides had many joint projects. Large Chinese companies mainly invest in

energy, chemicals and mining, while medium and small companies largely did business in agriculture and other sectors, he said.

Over the eight year period ending in 2012, direct foreign investment by Chinese companies in Russia increased 40 times to reach 4.9 billion U.S. dollars. In the first seven months of this year, the figure raised by another 250 million U.S. dollars, according to Tang Hua, an official with the National Development and Reform Commission, China's top economic planning body.

Chapter III. Methodology

3.1. Research Methodology

Research is important both in scientific and nonscientific fields. In our life new problems, events, phenomena and processes occur every day.

Practically, implementable solutions and suggestions are required for tackling new problems that arise. Scientists have to undertake research on them and find their causes, solutions, explanations and applications.

Precisely, research assists us to understand nature and natural phenomena.

The research process of the study will be based on the author's empirical observations combining with theoretical understanding. An extensive literature review is conducted accordingly with a purpose to gain knowledge about the situation of current research results in this field, and also examine the research gaps.

The key question that researcher is faced with when asked to assess the effects of a given policy measure deciding which methodical approach is best suited to answer the question giving existing constraints. At this stage, dialogue between researchers and policy stakeholders is crucial as, depending on the circumstances, researchers may help policy makers to determine relevant questions and to guide the choice of appropriate methodologies. The choice of methodology is not necessarily strait forward. It involves choosing between descriptive statistics and modelling approaches, between gravity and general equilibrium. (Practical guide to trade policy analysis. 2012)

In my research, I am going to use the empiric, quantitative and qualitative methods for the conducting my research. In this study, I have chosen Gravity model to compute the coal trade volume between Mongolia and its major trading partners, namely China, Russia, South Korea, Japan, USA, UK, Germany, Belarus, Check Republic and Kazakhstan. This analysis uses the dynamic data for period of 2001 to 2013.

3.2. Data collection

When we are collecting our thesis data, there are numerous things to consider. First, we must develop a good idea. Thesis ideas can come from many places. It is necessary to do thorough library search in areas that interest us and read others thesis. Importantly we must not waste time researching a topic that does not take our interest.

Good data collection involves collecting relevant data that adds to the body of knowledge. The main thing to remember with data collection is to keep it simple, but important.

Focus of my research will be on Mongolia's trade scenario in the context of North East Asian economic integration process. At the international level, the data will be gathered from World Bank databases, UN ComTrade (United Nations data for commodity trade), International Trade Centre databases and WTO databases and Economic Research Institute for North East Asia (ERINA).

At national level, the data will be gathered from National Statistic Office of Mongolia, newspapers, government papers, Internet posts and other information sources. The data analysis process will involve 3 steps, which are data preparation; data description and data inference.

For the purpose of conducting the empirical analysis I have collected statistical data for 12 selected countries to create a Panel data for Gravity model calculation. Collection of data include the dynamic statistics of 12 selected countries' GDP, Population, Distances between trade partners, trade costs for period of 13 years. For my thesis I used statistic tables and graphs with an indication of sources.

Chapter IV. Studies on Mongolia bilateral trade

4.1. Mongolia's trade with China

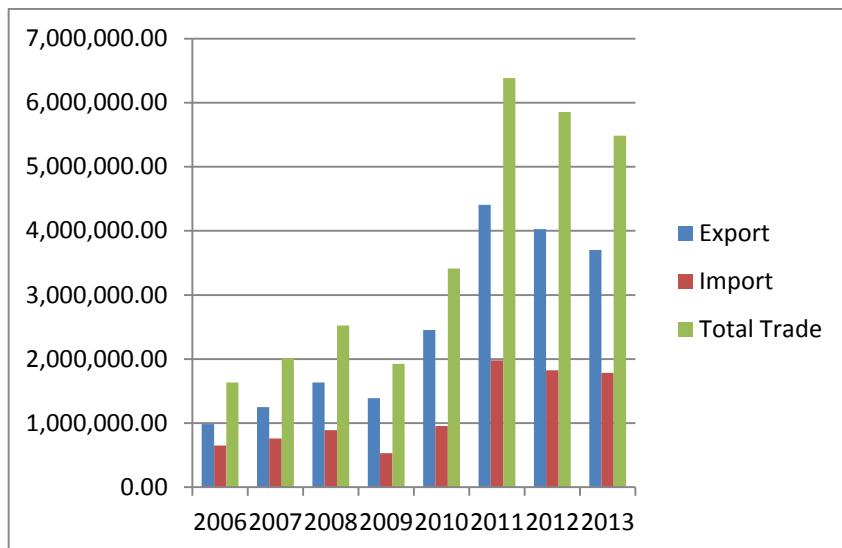
Trade with China represents more than half of Mongolia's total external trade - China receives more than 90% of Mongolia's exports.

Mongolia purchases 95% of its petroleum products and a substantial amount of electric power from Russia, leaving it vulnerable to price increases.

Mongolia exports to China are dominated by mineral exports (HS 25-27). Cumulative of this category accounted for 63.8% of total export to China. Raw hides, skins, leather and furs and textiles were the next major export commodities to China with their shares accounting 13.7% and 12.5% of total during the past period. The next largest groups of export commodities to China are metals (HS 72-83) and wooden products, which accounted 3.7% and 2.9% respectively of total export to China.

Figure 4.1. – Mongolia China trade (2006-2013)

(**Thousand USD**)



Source: Mongolia customs office

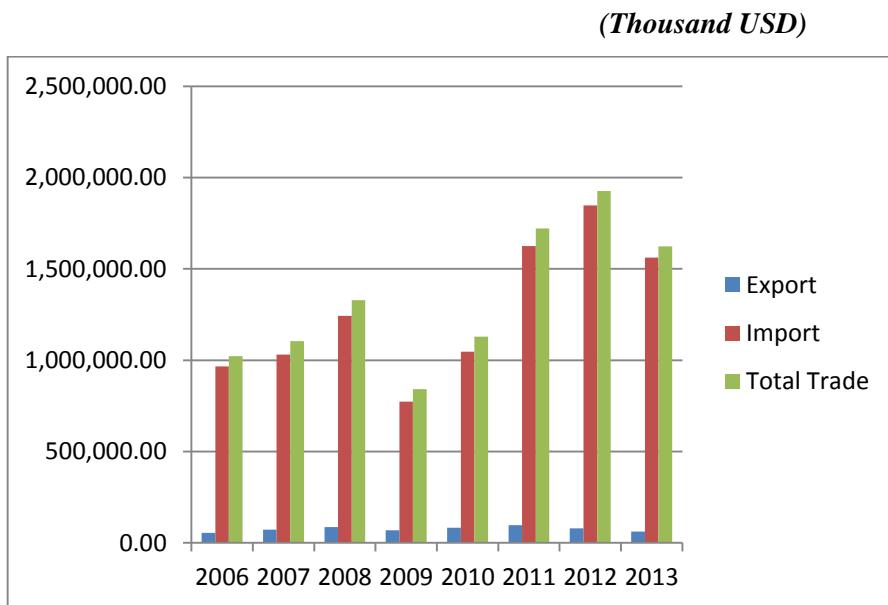
Textile imports were the major commodities within Mongolia from China, accounting for 28.5% of total imports from China. Vegetable products (HS 06-14) electrical machinery (HS 84-85) were the next largest import commodities accounting 13.7% and 12.7% respectively. (Foreign trade report of Mongolia. 2014).

4.2. Mongolia's trade with Russia

Mineral products (HS 25-27) were the major commodities of Mongolia's export to Russia, accounting for 65.3% of total exports to Russia. Animals and animal ordinated products (HS 01-05) were the next largest export commodity which accounted for 21.4% of total exports to Russia. Also,

transportation and textiles were other main exports accounting 1.9% and 1.4% respectively.

Figure 4.2. – Mongolia Russia trade (2006-2013)



Source: Mongolia customs office

Mongolia imports from Russia almost all of its petroleum products, which account for a large share of total imports. Imports for this section (Mineral products HS 25-27) accounted for 55% of total imports from Russia and machineries and medicines next largest imported category. Transportation (HS 86-89) and metals (HS 72-83) imports each accounted for approximately 8% of total imports.

Russia's share volume to our foreign trade has been decreasing for last five years. The trade deficit has a tendency of increasing moreover, because the Russian export in value to Mongolia has increased and

Mongolian export both in value and quantity to Russia has decreased. The current high import duties, VAT, railways tariff rates are still remaining main barriers to increase Mongolian export and product varieties.

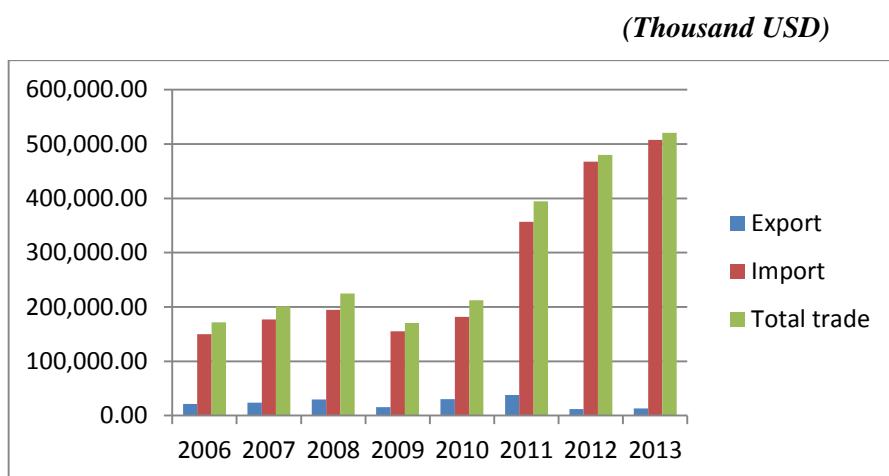
4.3. Mongolia's trade with South Korea

The structure of Mongolia's exports to South Korea demonstrated a random-walk pattern over the past period. Exports of minerals (HS 25-27) and non-monetary gold (HS 71) were predominant during the period, and cumulative shares of these commodities accounted for 27.3% and 47.3% respectively. Metals (HS 72-83) and textiles (HS 50-63) were the other main export commodities to South Korea, with shares accounting 9.5% and 9.2% respectively. However, the structure of Mongolia's imports from South Korea was relatively stable for the past period with majority imports being in the transportation (HS 86-89) and machinery/electrical (HS 84-85) categories. The shares of these groups were 25.8% and 20.6% respectively. Textiles (HS 50-63) and foodstuffs (HS16-24) were the other main imported items from South Korea, accounting 18% and 12.5% of the total imports.

South Korea and Mongolia have been important diplomatic and trading partners in over the last 20 years. Mongolia sees South Korea as its “third neighbor” and is keen to expand its partnership with Asia’s fourth largest economy and diversify its trade away from its two largest trading partners - China and Russia. The partnership between Mongolia and South Korea has developed significantly since the two countries launched diplomatic

relationships in 1990. South Korea has supported Mongolia in transition reforms to a market economy. Mongolia's trade with South Korea has almost quadrupled over the last decade and the Asia's fourth biggest economy is now the third largest trading partner of the resource rich country after China and Russia.

Figure 4.3. – Mongolia and South Korea trade (2006-2013)



Source: Mongolia customs office

South Korea is the 4th largest investor in Mongolia with total foreign direct investment (FDI) of over US\$255mn since 1990, according to the Foreign Investment and Foreign Trade Agency of Mongolia (FIFTA). South Korea is also a key donor who has provided approximately US\$137mn since 1990 in committed loans and grants to Mongolia. South Korean companies' major investments and engagements include:

- Skytel: a JV with South Korean SK Telecom and Mongolian shareholders.

- Unitel Corp.: a 50/50 South Korean-Mongolian JV that started providing GSM services from 2006
- Mongolian Telecom: Korea Telecom bought 40% of the Company for US\$4.5mn at privatization.
- Seoul Group: a property company with the first public luxury residential project in Ulaanbaatar
- Mongolian Development Bank: Korean Development Bank is expected to be hired as part of the management team to run this newly established Mongolian development institution.

Major South Korean companies including state-owned Korea Resources Corp, steelmaker Posco and Korea Electric Power Corp have bid to the Western Tsankhi coalfield, the largest area of the Tavan Tolgoi mine. The South Korean consortium is jointly bidding with Japanese and Russian companies. In March 2011, Lotte E&C-led South Korean consortium signed a preliminary deal with Mongolian Railways to build a 1,040-kilometer railway in Mongolia.

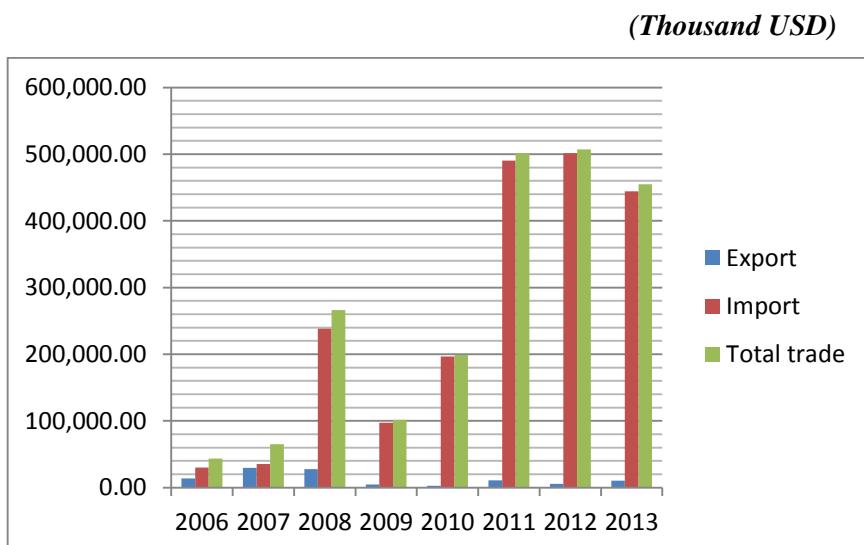
4.4. Mongolia's trade with Japan

Mongolia and Japan have been enjoying close economic relation in various areas such as trade and investment. More specifically, Japan's export to Mongolia has been recovering from a recession after "the Lehman Shock" from 10 billion yen in 2009 to 14 billion yen in 2010 while Japan's import from Mongolia has been remarkably increasing from

678 million yen in 2009 to 2 billion yen in 2010, according to the statistics of the Japanese Finance Ministry.

The foreign direct investment from Japan to Mongolia has also shown a steady growth from 2.5 million US dollars in 2007 to 7.1 million US dollars in 2010, according to the statistics of the Mongolian Foreign Investment and Foreign Trade Agency. (Oxford Report. Mongolia 2013)

Figure 4.4. – Mongolia and Japan trade (2006-2013)



Source: Mongolia customs office

Mongolia exports to Japan were dominated by fewer categories than the other major trading partners of Mongolia in the Northeastern Asian region, despite Japan granting Mongolia Preferential tariff treatment under its GSP scheme, which reduces or waives customs duties on imports from certain countries. Mongolian exports to Japan mainly consisted of textiles (HS 50-63)-specifically, semi processed cashmere, cashmere garments

and camel wool blankets accounting for 40.5% of the total cumulative exports during the past period.

As with exports to South Korea, exports of non-monetary gold (HS 71) and mineral products (HS 25-27) to Japan had a random walk pattern and shares of these commodities accounted for 29.5% and 21.7% respectively.

The structure of Mongolia's imports from Japan also had a limited number of commodity groups, with the predominance of machinery/electrical (HS 84-85) and transportation (HS 86-89).⁶ Shares of these items accounted for 45.5% and 35.8% of total imports from Japan.

However, commodities supplied via Japanese governmental loans and grant aid dominated Mongolia's import commodities from Japan. The cumulative shares of these products accounted for 34% and 21.3% of total imports, whereas imports on commercial basis accounted for 36.5%.

In the outset of further robust economic development, the country is keen to further diversify its export markets. Mongolia-Japan EPA/Y preparation dialogue started in 2007 and two sides agreed to set up a Joint Study Group to prepare the Joint report.

Mongolia and Japan EPA/ FTA officially launched² in 2012 and the first round of trade negotiations for an Economic Partnership Agreement (FTA

² <http://www.mofa.go.jp/policy/economy/fta/mongolia.html>

in Ulaanbaatar, Mongolia. In the negotiations, two parties discuss various trade related topics such as trade in goods (tariffs and non-tariff barriers) and trade in services, rules of origin, customs procedures and investment policies, technical barriers to trade (TBT) and competition etc. Till today 6 rounds of negotiations have been held between negotiators of two countries.

The conclusion of EPA between Mongolia and Japan, which will be the first FTA for Mongolia, will not only contribute to strengthening political and economic ties between the two countries but also become one of the key steps in building Mongolia-Japan “Strategic Partnership” emphasized in the Mongolia-Japan Joint Statement signed by Prime Ministers of two countries in November 2010. (Oxford The Report; Mongolia 2013)

Chapter V. Empirical analysis

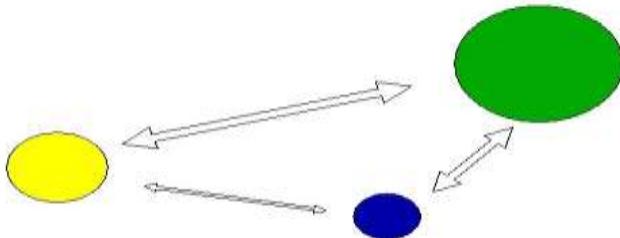
5.1. Gravity Model

The gravity model of trade in international economics, similar to other gravity models in social science, predicts bilateral trade flows based on the economic sizes (often using GDP measurements) and distance between two units. Tinbergen first used the model in 1962. The basic model for trade between two countries (i and j) takes the form of: Where F is the trade flow, M is the economic mass of each country, D is the distance and G is a constant. The model has also been used in international relations to evaluate the impact of treaties and alliances on trade, and it has been used to test the effectiveness of trade agreements and organizations such as the North American Free Trade Agreement (NAFTA) and the World Trade Organization (WTO).

Gravity models are used in various social sciences to predict and describe certain behaviors that mimic gravitational interaction as described in Isaac Newton's law of gravity. Generally, the social science models contain some elements of mass and distance, which lends them to the metaphor of physical gravity (WI 2014).

Graphic 5.1. – Gravity model

Illustration of the Gravity Model



The shorter the distance between two objects, and the greater the mass of either (or both) objects, the greater the gravitational pull between the objects.

Source: System Administrator 2013

The name of “Gravity” comes from the fact that non-linear form of equation 1 (a) resembles Newton’s law of gravity: trade is directly proportional to the exporting and importing countries’ “mass” economic sizes or GDP, and inversely proportional to the distance between them. In other words, gravity says that I expect larger country pairs to have more trade, but I expect countries far from each other to trade less, perhaps transport costs are between them are higher.

The Gravity model of trade presents a more empirical analysis of trading patterns. The gravity model, in its basic form, predicts trade based on the distance between countries and the interaction of the countries' economic sizes. The model mimics the Newtonian law of gravity, which also considers distance and physical size between two objects. The model has been proven to be empirically strong through econometric analysis.

$$F_{ij} = GM_i M_j D_{ij}^{-1} \eta_{ij}$$

Where:

- F_{ij} – trade flow (volume) between country i and j .
- G – constant
- M_i, M_j – Economic mass of country i and j, or GDP of countries.
- D_{ij} – distance between country i and j.
- η – Dummy variable which equals to 0 or 1.

Below table 9 is Panel data for computing the trade flow between Mongolia and Northeast Asian countries.

For computing, I am going to utilize the Gravity model and would like to compute it whether using E-Views7 software program. For over years, E-Views program has provided the very best in econometric analysis and forecasting software particularly in trade analysis. E-Views 7 features an innovative graphical object-oriented user-interface and a powerful analysis engine, blending the best of modern software technology. The result is a state-of-the art program that offers unprecedented power within a flexible, easy-to-use interface. Designed to be intuitive and easy-to-use, E-Views 7 allows me to employ a wide range of statistical and graphical techniques.

5.2. Gravity Model for Mongolia trade with partner countries

Over the last half century, the Gravity model has become the workhorse of the applied international trade literature. Starting with Tinbergen (1962) as I have mentioned above, the gravity model has given rise to literally thousands of publications covering a wide range of regions, time periods, and sectors.

The Gravity model of trade presents a more empirical analysis of trading patterns. The gravity model, in its basic form, predicts trade based on the distance between countries and the interaction of the countries' economic sizes³. The model mimics the Newtonian law of gravity, which also considers distance and physical size between two objects. The model has been proven to be empirically strong through econometric analysis.

By linking trade flows directly with economic size and inversely with trade costs, usually peroxide by geographical distance as an indicator of transport costs, the gravity model captures some deep regulations in the pattern of international trade and production. Indeed, Leamer and Levinsohn (1995) argued that the gravity model has produced“ some clearest and most robust findings in empirical economics”.

Today, the gravity model is used a key tool for researchers and students interested in the effects of trade related policies. It provides a convenient

1. ³ Ben Shepherd, “The gravity Model of International trade ”. UNESCAP. Bangkok. 2012.

testing bed on which to assess the trade impacts of different policies. Gravity model is now routinely include variables far beyond such as tariffs, which are imposed at border, to cover behind the border barriers as well.

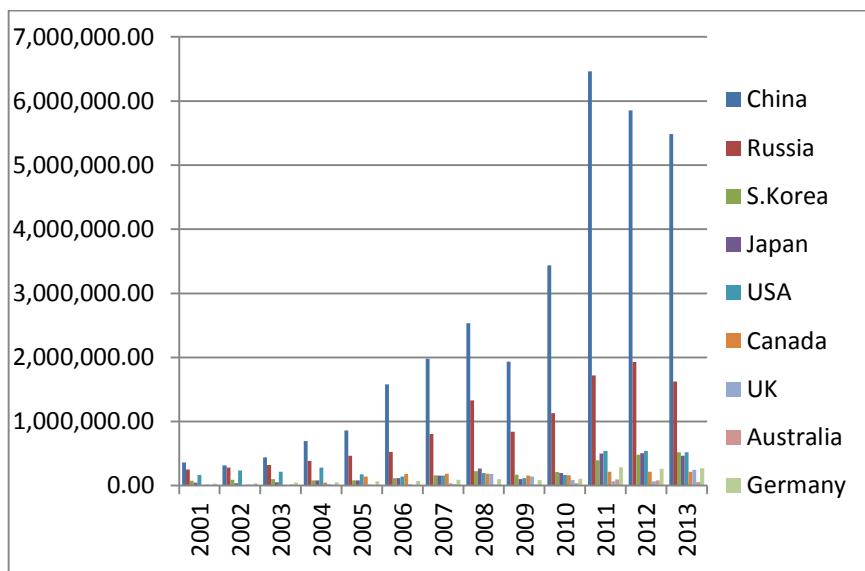
Traditionally, gravity models have been based on largely intuitive ideas as to which variables are likely to influence trade. Although it first put as an intuitive explanation of bilateral trade flows, the gravity model has more recently acquired a range of micro-founded bases. These approaches are important to policy researchers because they affect the data, specification, and econometric technique used to estimate the gravity model. Use of a theoretically grounded gravity model can lead to substantially different results and interpretations from those obtained via a “naive” formulation, and high quality policy research and advise needs to be based on rigorously established methodology. (The gravity Model for International trade. 2012)

5.3. Collection of panel data

In my research I put a task to find out, whether Mongolia can increase its trade with northeast Asian countries. To this end, I have chosen the Gravity model. In order to compute the model by E-views econometric program, I have created the panel data collecting the relevant statistics from reliable sources. For my computation, I selected 9 countries, or key trading partners of Mongolia. Dynamic statistics were taken from the data of Mongolian Customs Office for the period of 13 years starting from

2001 up to 2013, which are enough time periods to get a comparatively reliable result from computation.

Figure 5.1. Mongolia's trade turnover with trading partners (2002-2013)



Source: World Bank

GDP information of each 9 countries was taken from the World Bank official site for the period of 2001 – 2013. GDP statistics are key data for computation by Gravity model as it mainly base on economic size and distance between countries. The panel data, statistics are attached on the Appendix.

Figure 5.2. Mongolia's trading partner countries GDP

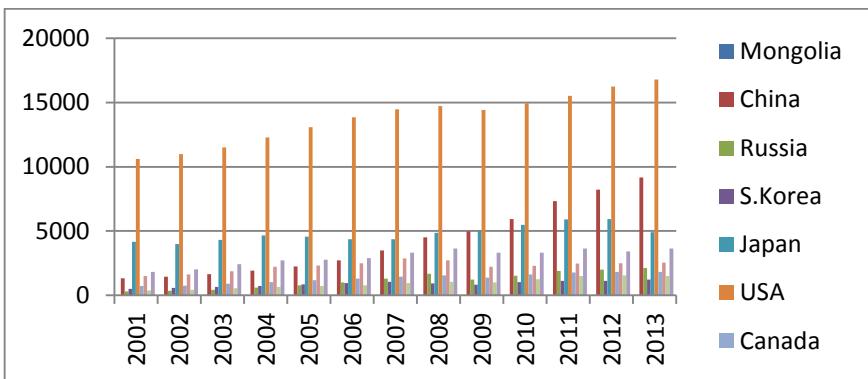
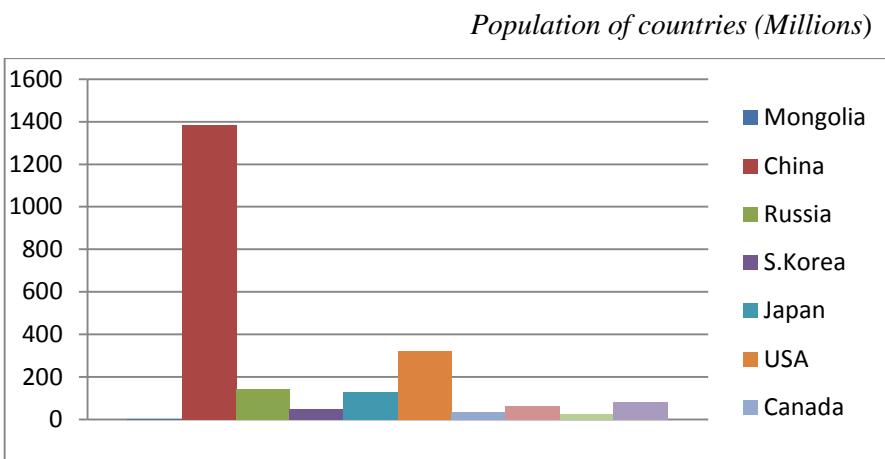


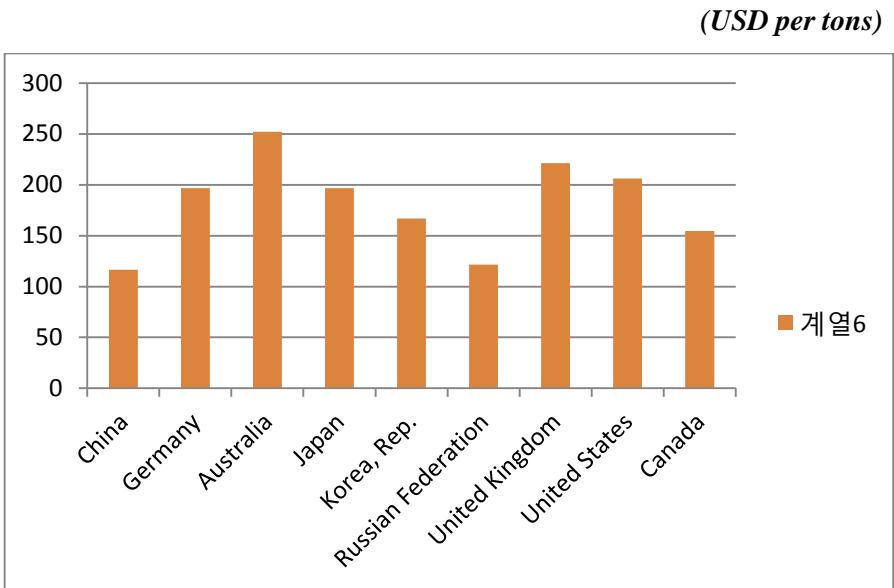
Figure 5.3. Population indication of Mongolia and its trading partner countries



[www.worldometers.info.](http://www.worldometers.info)

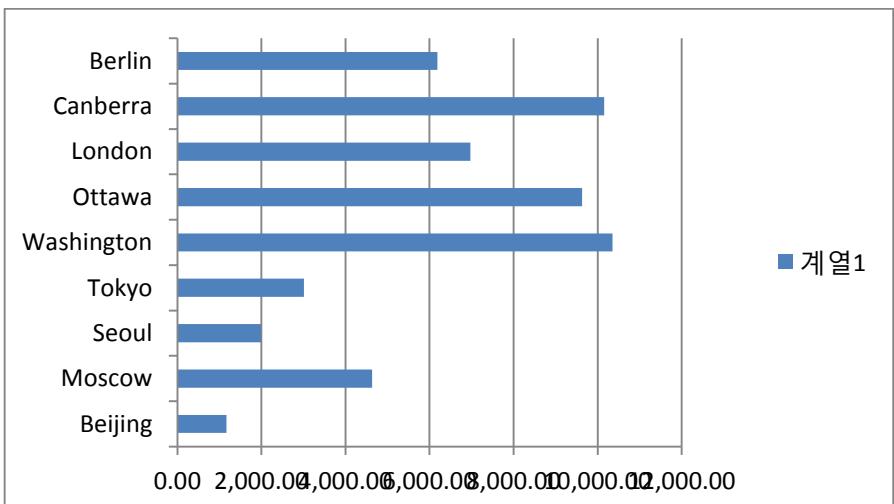
Trade costs: Trade cost data for each country were retrieved from the World Bank data and UNESCAP Trade Cost Database. There is ample evidence that successful implementation of bilateral or regional trade and economic integration initiatives would have a very significant impact on intraregional trade.

Figure 5.4. Trade Cost Diagram



Source: World Bank

Figure 5.5. Distance with Ulan Bator and other Capitals



Source:http://distancecalculator.globefeed.com/world_distance_calculator.asp

Figure 5.6. History and Adjacent Dummy variable

| | History | Adjacent |
|------------|---------|----------|
| China | 0.00 | 1.00 |
| Russia | 1.00 | 1.00 |
| S.Korea | 0.00 | 0.00 |
| Japan | 0.00 | 0.00 |
| USA | 0.00 | 0.00 |
| Canada | 0.00 | 0.00 |
| UK | 0.00 | 0.00 |
| Australia | 0.00 | 0.00 |
| Germany | 1.00 | 0.00 |
| Czech Rep. | 1.00 | 0.00 |
| Kazakhstan | 1.00 | 0.00 |
| Belorussia | 1.00 | 0.00 |

Note: CMEA countries = 1 whereas Non CMEA countries= 0

5.4. Results by E-views 7 software program

My equation consists of 6 variables, which are:

- Trade volume between Mongolia and its trading neighbors
- GDP of Mongolia and its trading neighbors
- Distance between countries
- Population of countries
- Adjacency
- History, in case of history I have chosen CMEA member countries as 1 and non CMEA member countries as 0 as my dummy variable.

Econometric equation:

$$\log(\text{TRADEmi}) = \alpha + \beta_1 \log(\text{GDPm} * \text{GDPI}) + \log(\text{TRADEmi}(-1)) \\ + \beta_2 \log(\text{GDPm}/\text{POPm} * \text{GDPI}/\text{POPi}) + \beta_3 \log(\text{DISTmi}) + \beta_4 \text{Adj} + \\ \beta_5 \text{HISTORYmi}$$

In most cases, foreign trade turnover between two countries are seen heavily dependent on the trade volume of previous year. Having considered this in mind, I included trade flow of Mongolia and other country (TRADEmi) in t-1 period, which is called “Lagged Dependent variable” in order to capture that time series effect. Lagged dependent variable is natural one, it is only control variable. I need to include this to make sure to control all the variables, and then my main independent variables are GDP, Pop, and Distance and then it is more reliable.

Applying the panel data into Gravity Model and run EVIEWS7 program, the following result came out:

Dependent Variable: LOG (TRADEMI)
 Method: Panel Least Squares
 Date: 11/23/14 Time: 11:04
 Sample (adjusted): 2002 2013
 Periods included: 12
 Cross-sections included: 12
 Total panel (balanced) observations: 144

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-----------------------|-------------|------------|-------------|--------|
| C | 4.791942 | 1.063312 | 4.506618 | 0.0000 |
| LOG(TRADEMI(-1)) | 0.638772 | 0.056334 | 11.33906 | 0.0000 |
| LOG(GDPM*GDPI) | 0.156415 | 0.064989 | 2.406775 | 0.0174 |
| LOG(GDPM/POPm*GDPI/P) | 0.069099 | 0.081525 | 0.847580 | 0.3982 |

| OPI) | | | | |
|--------------------|-----------------|-----------------------|-----------|--------|
| LOG(DISTMI) | -0.256251 | 0.097308 | -2.633384 | 0.0094 |
| ADJMI | 0.828678 | 0.246437 | 3.362632 | 0.0010 |
| HISTORYMI | -0.031628 | 0.123632 | -0.255821 | 0.7985 |
| R-squared | 0.901733 | Mean dependent var | 11.46709 | |
| Adjusted R-squared | 0.897430 | S.D. dependent var | 1.734693 | |
| S.E. of regression | 0.555564 | Akaike info criterion | 1.709723 | |
| Sum squared resid | 42.28520 | Schwarz criterion | 1.854089 | |
| Log likelihood | -116.1001 | Hannan-Quinn criter. | 1.768385 | |
| F-statistic | 209.5272 | Durbin-Watson stat | 2.032650 | |
| Prob(F-statistic) | 0.000000 | | | |

$$\text{LOG(TRADEMI)} = 4.8 + 0.6*\text{LOG(TRADEMI(-1))} + \\ 0.1*\text{LOG(GDPM*GDPI)} + 0.07*\text{LOG(GDPM/POPm*GDPI/POPI)} - \\ 0.26*\text{LOG(DISTMI)} + 0.8*\text{ADJMI} - 0.03*\text{HISTORYMI}$$

Result of calculation: Above logarithm equation explains that Mongolian foreign trade flow positively depends on (or positive influence) variables like “GDPmi”, “GDPmi per capita”, dummy variable “ADJmi” which represents Mongolian boundaries with partner countries; (TRADEMI(-1) trade volume of previous year and it negatively depends on (or negative influence) variables like distance “DISTmi” between Mongolia and partner countries.

Application of T-test on each coefficient of the logarithm equation, it

explains that variables of “GDPmi per capita” and dummy variable “HISTORYmi” of former socialist countries are below Module 2, but other variables of equation are higher than Module 2 and R^2 (R squared) or determination coefficient to **0.902**. That means equation’s explanation capability is **90.2 percent**, which is considerably good percentage that we can trust to the Model. I consider that I got this reasonably efficient model because of added variable, which represents the trade volume of previous year.

The above equation can be explained as following:

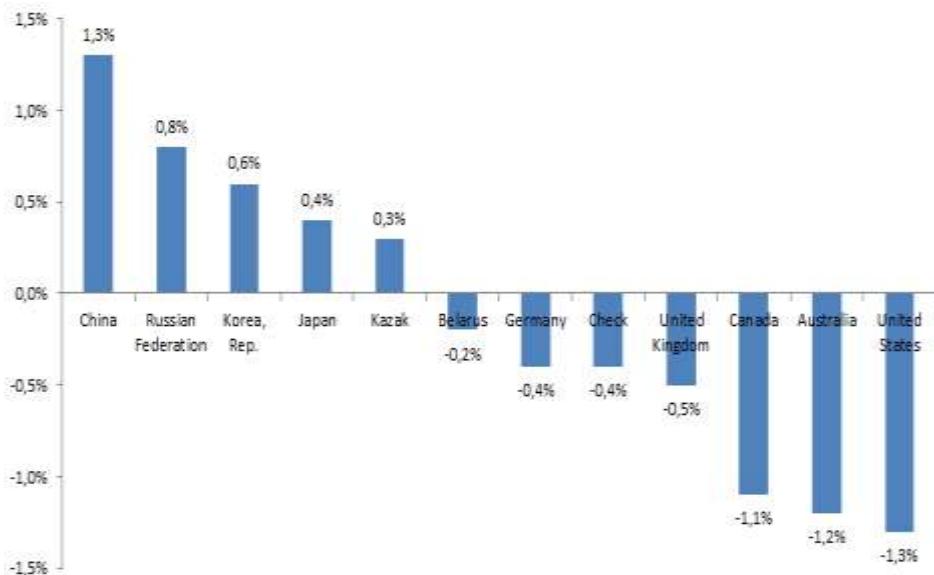
- The volume of Mongolia’s foreign trade turnover increases by 0.1 percent, when GDPs of Mongolia and other partner countries increase by 1 percent.
- If Mongolia has border with trading partner countries, then volume of Mongolia’s foreign trade turnover increases by 0.8 unit, and if not bordered, then equals to 0.
- Mongolia’s trade flow decreases by 0.26 percent, if the distance between Mongolia and its trading countries increases by 1 percent.
- If Mongolia’s trading partner country was a socialist country in the past, then trade volume decreases by 0.03 units. If not, then equals to 0.

- Mongolia's trade flow increases by 0.6 percent, if Mongolia's trade volume with the partner country increases by 1 percent.

Below graph describes how the trade flow of Mongolia with its trading partner countries changes when I increase each variables of the logarithm equation by 1 percent.

Mongolia's trade sensitivity by countries

(Upon increase of variables by 1 %)



Source: Authors calculation

CHAPTER VI. CONCLUSIONS

6.1. Conclusion

Foreign trade plays a crucial role for the Mongolian economy. Because Mongolia is landlocked country with a limited transportation network, Mongolia's two neighbors- China, and Russia- have largest presences in its foreign trade activities. China became largest export destination since 1990s. The majority of Mongolian exports to China consist of mineral products and raw materials of livestock origin. Mongolia's trade with China continued to experience surpluses, owing to these major export commodities. At the same time, exports to Russia diminished, yet Russia remained the major source of imports to Mongolia. Mongolia imports from Russia mainly petroleum products.

South Korea and Japan have emerged as export destinations for Mongolia, the volumes still remain limited. Mongolian exports to South Korea are variety of mining products, and to Japan have mainly consisted of semi processed and finished cashmere goods etc. Proximity in the Northeast Asia region, as well as the increased economic growth in South Korea and Japan will positively influence to increase trade flow of Mongolia with those countries in the region. Northeast Asian region represents more than half of the world coal and steel production and it dominates in the world markets in terms of production and consumption. Accordingly, mining

products can be potential exports of Mongolia towards Northeast Asian countries due to the increasing demand.

The outcome of my empirical analysis explains that Mongolia's trade is heavily affected by gravity model variables. It tends to trade more with closer and large countries. Mongolia's neighboring countries such as Russia and China have long traditional trade and these countries close distances, economic sizes are positively influence to trade expansion of Mongolia with these two countries. South Korea, Japan and Kazakhstan have comparatively positive results than other countries due to their economic sizes and proximity in the region.

In Mongolia's case GDP matters a lot, Population has less effect, and Distance has very significant negative impact and Adj has a positive effect. Thus, it can be interpreted that GDP is positive impact; means the size of economy has very significant positive impact on trade. Mongolia is still affected by distance factor. As Mongolia is land locked country, my empirical analysis once again proves my earlier hypothesis that "Economic size", "Distance" are key factors for Mongolia's trade expansion.

As Mongolia is land locked country, my empirical analysis of gravity

model once again proves my earlier hypothesis that “Economic size”, “Distance” are key factors for Mongolia’s trade expansion.

6.2. Recommendations

Based on my empirical analysis, it is recommendable for Mongolian government to pursue the trade strategy to focus on large neighboring countries such as Russia and China, as well as South Korea, Japan and Kazakhstan, the countries in the proximity in Northeast and Central Asian region, rather than trying to negotiate trade deals with long distance countries like USA, Australia, Canada and the UK etc.

My research findings explain that Mongolia has not been benefited from railway system. Therefore Mongolia’s policy implication would be: first to focus on trade with neighboring countries; secondly it needs to invest in railways projects to overcome distance factor. Thus, I recommend Mongolian Government to expedite its developments of railway and logistic projects to improve its railway connectivity towards sea ports (Tianjin port in China and Vostochny port in Vladivostok, Russia). This situation will significantly reduce country’s high trade cost and will potentially boost Mongolia’s trade with partner countries.

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Appendix

1. Panel Data of Figure 2.1.- Mongolia's Foreign Trade (2002-2013)

| | Export | Import | Total trade |
|------|--------------|--------------|---------------|
| 2002 | 690,382.50 | 523,963.30 | 1,214,345.80 |
| 2003 | 790,940.00 | 615,379.40 | 1,406,319.40 |
| 2004 | 1,019,333.60 | 869,084.30 | 1,888,417.90 |
| 2005 | 1,177,271.10 | 1,063,883.20 | 2,241,154.30 |
| 2006 | 1,435,052.50 | 1,541,964.40 | 2,977,016.90 |
| 2007 | 2,061,837.50 | 1,947,472.10 | 4,009,309.60 |
| 2008 | 3,244,540.90 | 2,534,466.40 | 5,779,007.30 |
| 2009 | 2,137,673.40 | 1,885,384.80 | 4,023,058.20 |
| 2010 | 3,200,053.40 | 2,908,502.30 | 6,108,555.70 |
| 2011 | 6,598,358.10 | 4,817,496.30 | 11,415,854.40 |
| 2012 | 6,738,380.70 | 4,384,669.20 | 11,123,049.90 |
| 2013 | 6,357,821.80 | 4,269,055.80 | 10,626,877.60 |

Source: Mongolian Customs Office

2. Panel Data of Figure 2.6. - Mongolian Import by Northeast Asian countries (2006-2013)

| | South | | | |
|------|----------|----------|-----------|----------|
| | Japan | Korea | China | Russia |
| 2006 | 29866.4 | 150004.9 | 648883.2 | 966755.4 |
| 2007 | 35241.3 | 177237.3 | 761648.6 | 1031465 |
| 2008 | 238526.7 | 194818.4 | 888022.2 | 1242275 |
| 2009 | 97053.5 | 155102.2 | 531668.7 | 772815.3 |
| 2010 | 196488 | 181781.9 | 956454.9 | 1046695 |
| 2011 | 490225.7 | 356725.1 | 1978166.7 | 1624706 |
| 2012 | 501618.2 | 467751.5 | 1825754.4 | 1847386 |
| 2013 | 444201.8 | 507359.7 | 1785785.8 | 1561852 |

Source: Mongolian Customs Office

3. Panel Data of Figure 4.1. – Mongolia China trade (2006-2013)

| | Export | Import | Total Trade |
|------|--------------|--------------|--------------|
| 2006 | 987,361.60 | 648,883.20 | 1,636,244.80 |
| 2007 | 1,251,426.40 | 761,648.60 | 2,013,075.00 |
| 2008 | 1,633,794.40 | 888,022.20 | 2,521,816.60 |
| 2009 | 1,392,323.00 | 531,668.70 | 1,923,991.70 |
| 2010 | 2,454,382.10 | 956,454.90 | 3,410,837.00 |
| 2011 | 4,404,561.10 | 1,978,166.70 | 6,382,727.80 |
| 2012 | 4,028,460.60 | 1,825,754.40 | 5,854,215.00 |
| 2013 | 3,700,268.80 | 1,785,785.80 | 5,486,054.60 |

Source: Mongolian Customs Office

4. Panel Data of Figure 4.2. - Mongolia Russia trade (2006-2013)

| Column1 | Export | Import | Total Trade |
|---------|-----------|--------------|--------------|
| 2006 | 55,261.40 | 966,755.40 | 1,022,016.80 |
| 2007 | 72,431.60 | 1,031,465.20 | 1,103,896.80 |
| 2008 | 86,318.00 | 1,242,275 | 1,328,593.30 |
| 2009 | 68,204.70 | 772,815.30 | 841,020.00 |
| 2010 | 82,747.90 | 1,046,695.20 | 1,129,443.10 |
| 2011 | 96,342.40 | 1,624,705.80 | 1,721,048.20 |
| 2012 | 79,565.70 | 1,847,385.70 | 1,926,951.40 |
| 2013 | 61,772.70 | 1,561,852.20 | 1,623,624.90 |

Source: Mongolian Customs Office

5. Panel Data of Figure 4.3. – Mongolia and South Korea trade (2006-2013)

| | Export | Import | Total trade |
|------|-----------|------------|-------------|
| 2006 | 21,456.30 | 150,004.90 | 171,461.20 |
| 2007 | 23,867.20 | 177,237.30 | 201,104.50 |
| 2008 | 29,892.00 | 194,818.40 | 224,710.40 |
| 2009 | 15,438.10 | 155,102.20 | 170,540.30 |
| 2010 | 30,519.90 | 181,781.90 | 212,301.80 |
| 2011 | 37,873.30 | 356,725.10 | 394,598.40 |
| 2012 | 12,295.60 | 467,751.50 | 480,047.10 |
| 2013 | 13,023.80 | 507,359.70 | 520,383.50 |

Source: Mongolian Customs Office

6. Panel Data of Figure 4.4. – Mongolia and Japan trade (2006-2013)

| | Export | Import | Total trade |
|------|-----------|------------|-------------|
| 2006 | 13,785.10 | 29,866.40 | 43,651.50 |
| 2007 | 29,664.20 | 35,241.30 | 64,905.50 |
| 2008 | 27,589.00 | 238,526.70 | 266,115.70 |
| 2009 | 4,564.20 | 97,053.50 | 101,617.70 |
| 2010 | 2,669.00 | 196,488.00 | 199,157.00 |
| 2011 | 10,963.90 | 490,225.70 | 501,189.60 |
| 2012 | 5,602.60 | 501,618.20 | 507,220.80 |
| 2013 | 10,534.30 | 444,201.80 | 454,736.10 |

Source: Customs Office of Mongolia

7. Panel Data of Figure 5.1. - Mongolia's trade turnover with trading partners (2002-2013)

(Thousand USD)

| | 2001 | 2002 | 2003 | 2004 |
|------------|------------|------------|------------|------------|
| China | 362,342.00 | 318,380.00 | 439,838.00 | 694,422.00 |
| Russia | 252,223.00 | 280,382.00 | 319,734.00 | 384,715.00 |
| S.Korea | 78,915.00 | 92,944.00 | 103,448.00 | 79,914.00 |
| Japan | 48,215.00 | 38,310.00 | 51,990.00 | 82,282.00 |
| USA | 164,541.00 | 237,897.00 | 215,405.00 | 280,783.00 |
| Canada | 3,340.00 | 8,219.00 | 13,422.00 | 49,405.00 |
| UK | 15,386.00 | 15,986.00 | 8,865.00 | 22,306.00 |
| Australia | 1,081.00 | 10,376.00 | 16,544.00 | 12,413.00 |
| Germany | 31,627.00 | 37,885.00 | 48,341.00 | 53,110.00 |
| Czech Rep. | 6,891.00 | 4,280.00 | 5,431.00 | 5,416.00 |
| Kazakhstan | 10,009.00 | 9,137.00 | 12,032.00 | 30,068.00 |
| Belorussia | 3,402.00 | 5,112.00 | 3,743.00 | 5,107.00 |

| 2005 | 2006 |
|------------|--------------|
| 859,913.00 | 1,580,978.00 |
| 465,654.00 | 527,581.00 |
| 82,516.00 | 116,746.00 |
| 79,931.00 | 114,557.00 |
| 174,544.00 | 143,990.00 |
| 142,184.00 | 179,455.00 |
| 15,302.00 | 20,770.00 |
| 10,588.00 | 13,335.00 |
| 68,620.00 | 70,527.00 |
| 6,519.00 | 5,663.00 |
| 47,460.00 | 67,465.00 |
| 7,678.00 | 4,766.00 |

Continued 2007 - 2013

| 2007 | 2008 | 2009 | 2010 |
|--------------|--------------|--------------|--------------|
| 1,980,300.00 | 2,534,600.00 | 1,932,500.00 | 3,437,200 |
| 803,500.00 | 1,328,600.00 | 841,200.00 | 1,129,400.00 |
| 161,100.00 | 224,700.00 | 170,600.00 | 212,300.00 |
| 155,300.00 | 266,100.00 | 101,600.00 | 199,200.00 |
| 155,600.00 | 198,300.00 | 117,600.00 | 164,900.00 |
| 188,600.00 | 185,400.00 | 155,400 | 163,900.00 |
| 35,900.00 | 183,200.00 | 139,400.00 | 87,300.00 |
| 19,800.00 | 18,500.00 | 16,100.00 | 38,900.00 |
| 94,300.00 | 103,600.00 | 85,900.00 | 109,300.00 |
| 10,965.00 | 15,618.00 | 9,170.00 | 8,303.00 |
| 35,638.00 | 35,638.00 | 32,445.00 | 23,300.00 |
| 3,824.00 | 7,525.00 | 10,648.00 | 13,162.00 |

Source: *World Bank*

| 2011 | 2012 | 2013 |
|--------------|--------------|--------------|
| 6,463,700.00 | 5,854,215.00 | 5,486,054.60 |
| 1,721,300.00 | 1,926,951.40 | 1,623,624.90 |
| 394,600.00 | 480,047.10 | 520,383.50 |
| 501,200.00 | 507,220.80 | 465,270.40 |
| 541,100.00 | 539,514.40 | 520474.8 |
| 219,100.00 | 214,518.20 | 215,903.40 |
| 67,400.00 | 65,438.10 | 247,190.30 |
| 94,700.00 | 80,727.20 | 58,665.90 |
| 288,600.00 | 262,413.60 | 270,594.70 |
| 135,535.00 | 21,685.00 | 15,096.00 |
| 36,877.00 | 546,619.00 | 111,602.00 |

| | | |
|-----------|------------|------------|
| 77,447.00 | 111,364.00 | 111,577.00 |
|-----------|------------|------------|

**8. Panel data of Figure 5.2. Mongolia's trading partners GDP
(Billion)**

| | 2001 | 2002 | 2003 |
|------------|-----------|-----------|-----------|
| Mongolia | 1.3 | 1.4 | 1.6 |
| China | 1,324.80 | 1,453.80 | 1,641.00 |
| Russia | 306.60 | 345.10 | 430.30 |
| S.Korea | 504.60 | 575.90 | 643.80 |
| Japan | 4,159.90 | 3,980.80 | 4,302.90 |
| USA | 10,625.30 | 10,980.20 | 11,512.30 |
| Canada | 732.70 | 752.50 | 887.80 |
| UK | 1,485.70 | 1,623.60 | 1,877.10 |
| Australia | 376.80 | 423.80 | 540.80 |
| Germany | 1,812.50 | 2,013.70 | 2,428.50 |
| Czech Rep. | 64.40 | 78.40 | 95.30 |
| Kazakhstan | 22.20 | 24.60 | 30.80 |
| Belorussia | 12.40 | 14.66 | 17.80 |

| 2004 | 2005 | 2006 |
|-----------|-----------|-----------|
| 2 | 2.5 | 3.4 |
| 1,931.60 | 2,256.90 | 2,712.90 |
| 591.20 | 763.70 | 989.90 |
| 722.00 | 844.90 | 951.80 |
| 4,655.80 | 4,571.90 | 4,356.80 |
| 12,277.00 | 13,095.40 | 13,857.90 |
| 1,018.40 | 1,164.20 | 1,310.80 |
| 2,221.90 | 2,324.20 | 2,486.60 |
| 657.80 | 733.00 | 781.60 |

| | | |
|----------|----------|----------|
| 2,729.90 | 2,771.10 | 2,905.40 |
| 114.00 | 130.10 | 148.40 |
| 433.20 | 57.10 | 81.00 |
| 23.10 | 30.20 | 37.00 |

Continued

| 2007 | 2008 | 2009 | 2010 |
|-----------|-----------|-----------|-----------|
| 4.2 | 5.6 | 4.6 | 6.2 |
| 3,494.20 | 4,520.00 | 4,990.50 | 5,930 |
| 1,299.70 | 1,660.80 | 1,222.60 | 1,524.90 |
| 1,049.20 | 931.40 | 834.10 | 1,014.90 |
| 4,356.30 | 4,849.20 | 5,035.10 | 5,495.40 |
| 14,480.40 | 14,720.30 | 14,418.00 | 14,958.30 |
| 1,457.90 | 1,542.60 | 1,371 | 1,614.10 |
| 2,858.20 | 2,709.60 | 2,217.40 | 2,296.90 |
| 948.90 | 1,054.60 | 997.60 | 1,249.30 |
| 3,328.60 | 3,640.70 | 3,306.80 | 3,310.60 |
| 180.50 | 225.40 | 197.20 | 198.50 |
| 104.90 | 133.40 | 115.30 | 148.00 |
| 45.30 | 60.80 | 49.20 | 55.20 |

www.worldometers.info.

| 2011 | 2012 | 2013 |
|-----------|-----------|-----------|
| 8.8 | 10.3 | 11.5 |
| 7,322.00 | 8,229.40 | 9,181.40 |
| 1,893.80 | 2,004.30 | 2,118.00 |
| 1,114.50 | 1,129.60 | 1,221.80 |
| 5,905.60 | 5,937.80 | 4,901.50 |
| 15,533.80 | 16,244.60 | 16,799.70 |
| 1,778.60 | 1,821.40 | 1,825.10 |

| | | |
|----------|----------|----------|
| 2,464.60 | 2,484.40 | 2,535.80 |
| 1,498.50 | 1,555.30 | 1,505.30 |
| 3,631.40 | 3,427.90 | 3,636.00 |
| 216.10 | 196.40 | 198.30 |
| 188.00 | 203.50 | 220.30 |
| 59.70 | 63.60 | 71.70 |

9. Panel data of Figure 5.2. Population of Mongolia and its partner countries

Population of countries (Millions)

| Countries | 2013 |
|------------|----------|
| Mongolia | 2.84 |
| China | 1,385.56 |
| Russia | 142.83 |
| S.Korea | 50.22 |
| Japan | 127.14 |
| USA | 320.5 |
| Canada | 35.15 |
| UK | 62.13 |
| Australia | 23.13 |
| Germany | 82.72 |
| Czech Rep. | 11 |
| Kazakhstan | 17.95 |
| Belorussia | 9.61 |

[www.worldometers.info.](http://www.worldometers.info)

10. Panel data of Figure 5.4. Trade Cost with partner countries

(USD per ton)

| | Partner Code | Sector | Sector Code | 2001 |
|-----------------------|-----------------|----------------|----------------|----------|
| China | CHN | Total Trade | GTT | 129.3653 |
| Germany | DEU | Total Trade | GTT | 177.2311 |
| Australia | AUS | Total Trade | GTT | 536.1261 |
| Japan | JPN | Total Trade | GTT | 183.4095 |
| Korea, Rep. | KOR | Total Trade | GTT | 204.4627 |
| Russian Federation | RUS | Total Trade | GTT | 53.14083 |
| United Kingdom | GBR | Total Trade | GTT | 182.5205 |
| United States | USA | Total Trade | GTT | 179.4674 |
| Canada | CAN | Total Trade | GTT | 272.3115 |

Continued....

| 2002 | 2003 | 2004 | 2005 | 2006 |
|----------|----------|----------|----------|----------|
| 128.6265 | 125.2916 | 119.8288 | 121.662 | 117.4 |
| 181.5511 | 203.0814 | 210.998 | 194.9223 | 181.4233 |

| | | | | |
|----------|----------|----------|----------|----------|
| 455.2146 | 305.1916 | 416.3711 | 147.757 | 130.6433 |
| 190.2668 | 176.8431 | 203.3788 | 199.9565 | 187.1133 |
| 206.4889 | 182.3593 | 183.8988 | 128.1616 | 147.8032 |
| 62.02044 | 70.90006 | 79.77967 | 97.5389 | 96.47065 |
| 196.0575 | 187.1373 | 205.5584 | 207.8173 | 178.0093 |
| 187.5482 | 192.7263 | 172.823 | 138.5714 | 158.9652 |
| 272.3115 | 272.3115 | 272.3115 | 272.3115 | 273.3183 |

Source: World Bank

| 2007 | 2008 | 2009 | 2010 |
|----------|----------|----------|----------|
| 119.8952 | 117.6123 | 109.0616 | 116.4224 |
| 168.388 | 171.0088 | 180.6468 | 196.8404 |
| 279.1241 | 173.2821 | 253.8829 | 252.1796 |
| 166.0017 | 198.8355 | 190.5331 | 196.8336 |
| 155.6787 | 128.9374 | 150.8556 | 166.7355 |
| 112.4145 | 113.376 | 110.0741 | 121.6694 |
| 159.8985 | 154.2535 | 185.6665 | 221.2059 |
| 157.5276 | 170.6636 | 184.0845 | 206.2254 |
| 180.5907 | 136.746 | 144.7789 | 154.6249 |

11. Panel Data of Figure 5.5. Distance of Ulan Bator and other Capitals

(Km)

| | Ulaanbaatar |
|---------|-------------|
| Beijing | 1,166.00 |
| Moscow | 4,630.60 |
| Seoul | 1,993.70 |
| Tokyo | 3,011.60 |

| | |
|------------|-----------|
| Washington | 10,353.60 |
| Ottawa | 9,632.80 |
| London | 6,971.60 |
| Canberra | 10,156.60 |
| Berlin | 6,190.20 |

source:

http://distancecalculator.globefeed.com/world_distance_calculator.asp

국문초록

몽골의 동북아 국가와의 무역 유형에 관한 연구

: Gravity 모형 접근법

Nomin Enkhbold

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서울대학교

본 연구는 몽골의 교역 파트너들과의 무역 시나리오를 검토하여
몽골의 해외시장, 특히 동북아 지역의 국가들을 향한 수출을
확대할 수 있는 기회를 모색하고자 하였다.

본 연구는 먼저 1, 2장에서 몽골의 경제적 배경과 연구문제를
밝히고, 이어지는 3, 4 장에서 몽골의 무역 시나리오에 대해
개괄적으로 묘사하였다. 끝으로 5, 6장에서 몽골의 무역
시나리오에 있어서 기회를 설명하기 위해서 주요한 무역
대상국들과의 무역성과에 대한 실증 분석을 실시하였다. 이를
위해서 “Gravity model” 을 사용하여 몽골의 무역이 gravity
모형에서 제시한 주요 요인에 의해 결정되고 영향을 받는지를
설명하고자 했다. 2001년부터 2013년까지 13년동안을 연구기간을

하여 12개의 국가들과의 무역 다이나믹 데이터를 분석에 사용하였으며, 분석을 위해서 E Views 7 프로그램을 사용하였다. 마지막 장에서는 연구분석의 결과를 결론적으로 제시하고 연구의 발견에 기반하여 정책적 함의점을 제안하였다.

주요어: 국제무역, 몽골 수출, 교역국, gravity 모델, 동북아 지역

학번: 2013-23943