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ANALYZING THE EFFECTS OF MONGOLIA'S ACCESSION TO ASIA-PACIFIC TRADE AGREEMENT (APTA)

V.Enkhbold[1], N.Otgonsaikhan[2], D.Tegshjargal[3]

Abstract

This paper investigates the early effects of Mongolia's accession to the Asia-Pacific Trade Agreement (APTA). The Gravity model is employed in this study to analyze the effects of key factors that affect trade costs for land-locked Mongolia. In addition, the Spearman's rank correlation of revealed advantage (SRC) and Trade intensity index (TII) are used to identify the Mongolian export products suitable for the APTA market. The paper concludes that Mongolia would be able to increase its trade flow for the APTA market after its accession to the regional trade agreement.

Keywords: Asia Pacific Trade Agreement (APTA), gravity model, trade indexes, tariff concessions, trade costs, land-locked country.

1. Introduction:

Trade plays an important role in economic development of Mongolia. Mongolia joined the World Trade Organization in 1997. Since then, Mongolia adopted laws and regulations to bring its regulatory regime in line with WTO rules. Mongolia bound all its national tariff lines in *ad valorem* terms, with an average bound rate of 17.3%, however it maintains a lower applied tariff rate with a current average being around 5%. Mongolia has not retained the rights for maintaining any tariff quotas, domestic support, or export subsidies for agricultural products.

The trade policy of Mongolia was reviewed by the WTO in 2005[4] and 2014[5] respectively. Today Mongolia is pursuing a relatively liberal trade policy.

The Mongolian economy is still heavily dependent on foreign trade and 37.1% of its GDP accounts for exports.

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1 V. Enkhbold (PhD). Trade consultant

2 N. Otgonsiakhan (PhD). School of Business, National University of Mongolia

3 D. Tegshjargal (MA). Researcher

4 www.wto.org/english/tratop_e/tpr_e/tp245_crc_e.htm

5 www.wto.org/english/tratop_e/tpr_e/tp397_e.htm

Although the export has increased substantially, trade still remains in deficit. The reasons behind are: the dependency on few export commodities, the high percentage of raw materials in exports, the heavy dependency of these raw materials on the world market prices. The Mongolian exports are composed of few items, namely minerals such as copper, molybdenum, fluorspar concentrates, gold, coal, crude oil, natural stones, and animal-originating raw materials, such as wool, cashmere, hides and skins, meat. The key import products are fuel, vehicles, textiles, heavy machinery, equipment and electrical appliance.[6]

In order to diversify the export procust structure and export markets, Mongolia is seeking to accede to regional trade agreements to gain preferential market access for its goods and services. The Concept of Mongolia's Foreign Policy"[7] has provided a specific guidance on expanding and developing the regional economic integration. Particularly, chapter 3 of the concept defines that "The fundamental objective of the Mongolia's foreign economic relations lies in the optimal use of external factors to adequate solutions to long-term and current economic goals in the light of the concept of sustainable development and in eventually securing a proper place for its economy in regional economic integration".

Within this policy and guidance, Mongolia is pursuing to conclude regional and bilateral trade agreements. As such, Mongolian government has expressed its interest to join the Asia Pacific Trade Agreement (APTA) in 2009. The Asia and the Pacific region countries signed a preferential trade agreement named the "Bangkok Agreement" in 1975 and renamed it as the "Asia Pacific Trade Agreement" in 2005. As of today, Bangladesh, Lao PDR, China, the Republic of Korea, Sri-Lanka and India are members of the APTA. Mongolia successfully concluded negotiations with all participating countries in 2013. Consequently the 42nd of the Stand in Committee Session of the APTA has approved the accession of Mongolia[8].

The main purpose of the present study is to analyze the benefits in terms of expanded trade for Mongolia after joining the APTA. The paper has the following structure. The first two sections cover the analysis of the overall trade pattern of Mongolia and its structure with the APTA countries. In section 3,

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6 www.ecustoms.mn

7 www.mfa.gov.mn

8 http://www.unescap.org/news/apta-welcomes-mongolia-its-seventh-member

some trade performance indexes are used to identify the possible export products from Mongolia the to APTA countries. Accordingly, the Herfindahl-Hirschman Index (HHI) is calculated to measure the extent of the countries' export diversification. Also, it analyzes the similarities of trade pattern of Mongolia with each APTA member country, by estimating two different trade indexes such as the Revealed Comparative Advantage (RCA) and the Trade Intensity Index (TII).

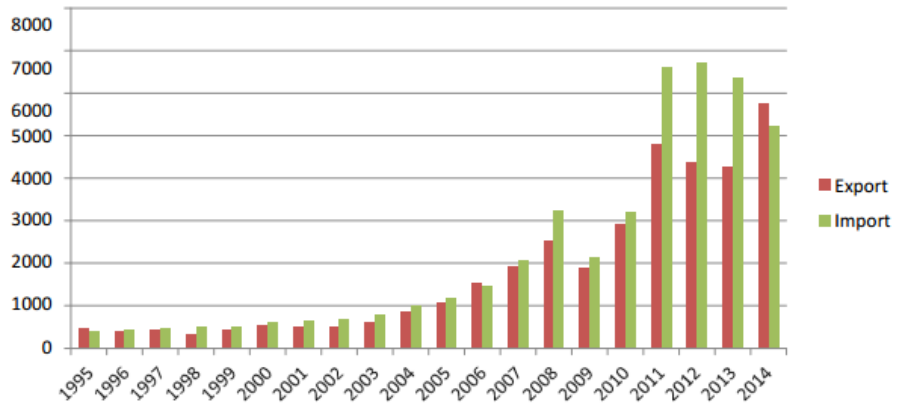
The Trade Intensity Index is used to identify the sectors which are highly intensive on the APTA market. This section will match the products under the current concession list (HS-2 digits) for the import products of the APTA countries from Mongolia. Section 4 analyzes the factors affecting the Mongolian trade with the APTA countries. In this section, the export demand function is developed to forecast the impacts of tariff concessions. Finally, the gravity model is used to identify the key factors affecting the Mongolian trade with the APTA countries. The model uses a few variables, such as distance and the GDP, tariffs, entry costs, container cost, etc. Section 5 concludes the study and suggests policy implications.

2. **The Mongolian current trade with APTA countries.**

In 2014, Mongolia traded with 139 countries and total trade flow reached USD11.0 billion, of which export USD 5.8 billion and import USD 5.2 billion. The Mongolian trade was in deficit since 1990 except for three years – once in 1999, when there was a recovery of the manufacturing sector, and the other in 2006, when higher world commodity prices benefited from Mongolian exports. It also has showed a surplus in 2014 (Figure 1).

Mining products and minerals account for the majority of Mongolia's exports. As of 2014, coal represented 42.9% of total export, copper concentrate - 19.1%, iron ore and concentrate - 12.1%, all kinds of fuels and lubricants - 23.2% and gold - 16.6% respectively.

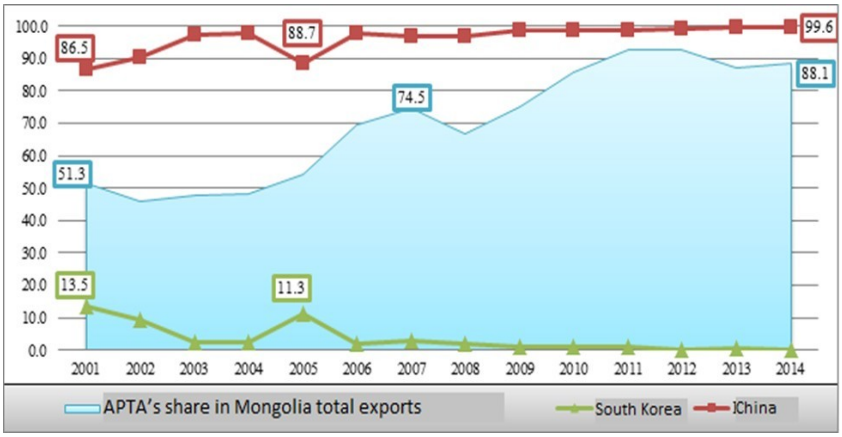
Figure 1. Mongolian trade flows, in USD million



Source: Mongolian Customs Department

The trade with the APTA countries plays an important role in the Mongolia's overall trade. As of 2014, APTA countries accounted for 65% of total trade of Mongolia. In particular, this amount reached to 88.1% in total exports, against 51.3% in 2001. China accounts for 90% of Mongolian exports to APTA countries. The weighted average of APTA countries in the total export of Mongolia is shown in the figure 2.

Figure 2. Weighted average of Mongolian exports to the APTA market, (%)

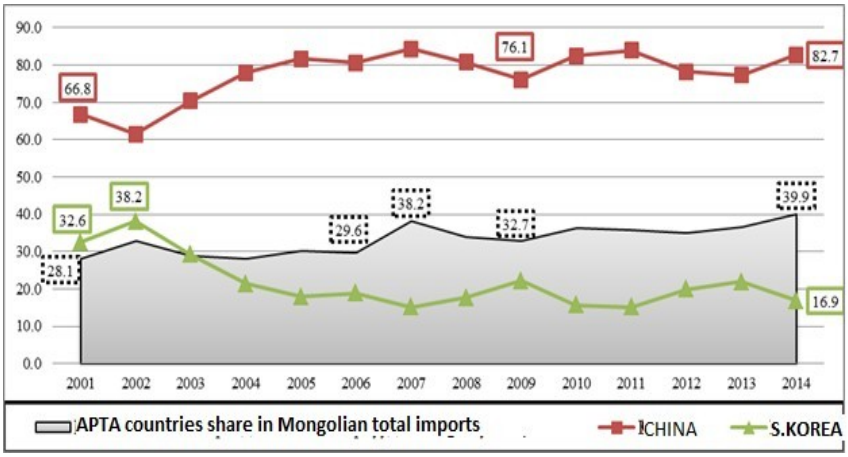


Source: The Mongolian Customs Department

In 2014, the Mongolian import from the APTA countries reached a value of 39.9% in Mongolia's total imports, while it was 28.1% in 2001. Out of that, China accounted for 82.7%, South Korea - 16.9%, India - 0.38% and others - 3%, respectively. The

weighted average of the APTA countries in Mongolia's total imports is shown in the Figure 3.

Figure 3. Weighted average of Mongolian imports from APTA market. (%)



Source: Customs Statistics of Mongolia

3. **Analysis on Mongolian goods export to the APTA countries.**

According to international trade theory, any country can benefit from specializing in the production of goods with comparative advantages. Bela Balassa, first proposed the idea of using an index called Revealed Comparative Advantage, to determine the comparative advantage of countries (Balassa, 1965). Accordingly, the authors tasked to identify the Mongolian potential export products to the APTA used this approach. A combination of indexes is used in the study to determine the revealed comparative advantages of Mongolia's exports[9] and APTA countries'
Imports[10]. The commodity structure of the APTA imports helps to identify APTA's relative import demand for products and the RCA index of Mongolian export helps to identify the goods that can be exported to the APTA market. For a particular product, if the comparative advantage indexes for export are same, more than 1, i.e. $RCA_{ij} > 1$, $RMA_{ij} > 1$, the product is considered to have a higher possibility of trading with each other.

Authors identified that products of the HS 51, 26, 25, 41, 05, 71, 27 have comparative export advantages. (See Annexes 2/HS2/ and 3/HS6/). Namely, cashmere, fluorspar, copper, tungsten, molybdenum ores and concentrates, copper, coal, skins of camel, cattle, sheep and goat, camel wool, sheep and

cattle wool, animal wool clothing, cashmere clothing, beef, horse meat, etc.

The analysis explains that minerals and livestock raw materials have high comparative advantages. In the case of comparative advantages of the Chinese import, around 20 groups out of HS 97 groups have import comparative advantages and most of them are natural resources and raw materials. This shows that China has been highly successful in importing raw materials and turning them into value added products. In the case of India, almost 20 groups at 2 digit HS are commodities with export comparative advantages. The fact that countries like Lao PDR, Sri-Lanka, Bangladesh have more commodity groups that have import comparative advantages for Mongolia. While studying the export opportunities of commodities for these countries, the Mongolian export's comparative advantage is overlapping with the import's comparative advantages of these countries and it need to be further investigated. Therefore, an overlapping is disclosed through comparing commodities' groups with export's comparative advantage of Mongolia with the import's comparative advantage of the APTA countries. (See Table 1)

Table 1. Overlapping of export comparative advantage of Mongolia and import comparative advantage of the APTA countries, year of 2014

Mongolian			Import of partner countries			
			With comparative advantage		**Without comparative advantage**	
HS code	Product description	RXA	RMA>2 Very high	2>RMA>1 High	1>RMA>0.5 High	RMA<0.5 Very high
51	Wool, animal hair, horsehair yarn and fabric thereof	70.3	Bangladesh (2.6) China (2.4)	India (1.2)	Korea (0.9) Sri Lanka (0.8)	Lao (0.1)
26	Ores, slag and ash	46.0	China (5.0) Korea (2.3)	India (1.2)		Lao (0.02) Sri Lanka (0.01) Bangladesh (0.01)
25	Salt, Sulphur, earth, stone, plaster, lime and cement	4.9	Sri Lanka (10.3) Lao (4.1) Bangladesh (2.6) India (2.0)	China (1.1)	Korea (0.6)	
41	Raw hides and skins (other than fur skins) and leather	3.2	China (2.2)	Bangladesh (1.6) Korea (1.1)	India (0.8) Sri Lanka (0.5)	Lao (0.1)

05	Products of animal origin, nes	2.8	Bangladesh (2.9)	Korea (1.3)	Sri Lanka (0.5)	China (0.4) India (0.2) Lao 0.1)
71	Pearls, precious stones, metals, coins, etc.	2.1	India (4.6)		China (0.8) Lao (0.6)	Korea (0.3) Sri Lanka (0.3) Bangladesh (0.2)
27	Mineral fuels, oils, distillation products, etc.	1.6	India (2.3) Korea (2.0)	Sri Lanka (1.4) China (1.0)	Lao (0.9)	Bangladesh (0.4)
74	Copper and articles thereof	0.9	China (2.9)	Korea (1.4)	India (0.8) Sri lanka (0.6) Banglades h (0.5)	Lao (0.1)
57	Carpets and other textile floor coverings	0.5			Sri lanka (0.5)	Lao (0.3) Bangladesh (0.3) India (0.2) Korea (0.2) China (0.1)

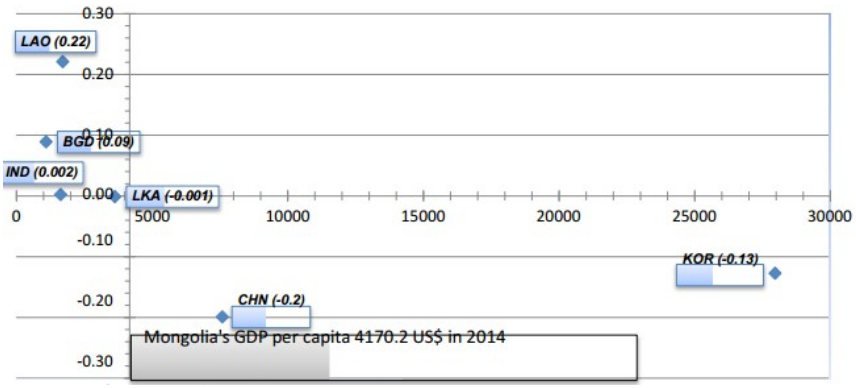
Source: Authors' calculation based ITC data

There is a high possibility of exporting gold to India. Also, minerals of the HS 25, 26, 27 groups and commodities such as "wools, fine or coarse animal hairs, wools, fleece, horse hair yarn and their woven fabrics" of the HS 51 group have potentials for export. Import comparative advantages of countries, such as Lao, Sri-Lanka, Bangladesh are seen to be higher, as compared to other countries.

For example, in case of Lao PDR, only the commodities of the HS 25 group including "salt, sulphur, earth minerals, stones, plastering minerals, lime and cement" have import comparative advantages; likewise in case of Sri-Lanka "salt, sulphur, earth minerals, stones, plastering minerals, lime and cement" of the HS 25 group and "mineral fuel, oil and its products; bituminous minerals; mineral waxes" of the HS 27 group.

In conclusion, table explains that Mongolia has potentials to export following commodities to each country: China - HS 25, 26, 41, 51, 74 and 27; South Korea – HS 26, 27, 41, 05 and 74; Bangladesh – HS 51, 25, 41, 05; India – HS 51, 26, 25, 71 and 27; Sri-Lanka –HS 25 and 27; Lao PDR– HS 25 respectively.

Figure 4. Spearman's rank correlation of comparative advantage of



Source: Authors' calculation based on ITC data.

Also, the expected benefits for Mongolia from joining to the APTA will depend on the trade structures of the APTA countries. In order to find out whether export structures of the APTA countries are same or different from Mongolia's structure, the Spearman's rank correlation of comparative advantage index has been calculated (Figure 4). The vertical axis represents the GDP per capita and the horizontal axis shows the cost of production.

A negative value explains the structural difference between Mongolia and the APTA countries means a higher efficiency from trade with each other. As opposed, a positive value explains structural similarity between countries, meaning a less efficiency from trade between Mongolia and the APTA countries. Thus, the figure explains that the export structures of Lao PDR, Bangladesh, and India show weak efficiencies for the Mongolian exports, while higher potentials are seen for China, ROK and Sri-Lanka.

Table 2. Trade Intensity Index of export from Mongolia to the APTA countries

Rank	China		Korea		India		Banglades h	
	HS 2	TII	HS 2	TII	HS 2	TII	HS 2	TII
1	51	234.31	85	15.48	51	8.21	41	0.05
2	26	51.15	10	2.39	13	3.02	88	0.66
3	25	31.11	87	1.24	90	0.00	40	0.04
4	78	23.79	26	1.10	83	0.02	73	0.01
5	27	22.65	82	0.83	25	0.00	85	0.00
6	57	18.96	68	0.79	26	0.00		
7	41	15.15	32	0.15	41	0.00		

8	05	10.11	90	0.14	82	0.00		
9	02	5.51	88	0.11	84	0.00		
10	23	3.23	20	0.08				
11	61	2.03	12	0.06				
12	74	1.41	61	0.04				
13	76	1.18	94	0.03				
14	18	1.15	05	0.03				
15	94	1.11	84	0.02				
16	17	1.01	42	0.02				

Source: Authors' calculation based on ITC data.

By using the Spearman's rank correlation of comparative advantage, the authors calculated to identify if export commodity structures of APTA countries are same or different against Mongolian structure. To do this task, authors calculated Trading Intensity Index (TII)[11]. The index is used to estimate the effects of changes in the structure of trade between Mongolia and APTA countries. It is computed as the ratio of an export share of Mongolia to particular APTA country against a share of particular country in the world export. Using this approach, the authors assumed that index can explain the "gains and losses" for Mongolia.

Table 2 explains that Mongolia has a high trading intensity with the APTA countries in relation to the natural resources and products of animal origin. For example, the density with China in the HS 51 group - "wool, animal hair, horse hair yarn and fabric thereof" and the HS 26 - "ore, concentration"; India – the HS 51 - "wool, animal hair, horse hair yarn and fabric thereof", South Korea – the HS 26 - "ore, concentration"; Bangladesh – the HS 41 group "animal skin, haute".

4. The Gravity model approach (AvW)

Over the years, the Gravity Model has played an important role in the estimation of trade patterns. The Model has been a success from the empirical point of view. This Gravity model was first analyzed by Tinbergen (1962) and Poyhonen (1963) for estimating bilateral trade flows within the EU countries. Studies, such as Anderson (1979), Bergstarnd (1985), Sanso et.al (1993), Matyas (1997, 1998) and Anderson and Wincoop (2003) have improved upon its theoretical foundations and these models have been applied by several empirical studies.

First, the authors calculated the potential gains for Mongolia from the tariff concessions after joining the APTA. Arithmetic average of tariff concessions between Mongolia and each of the APTA countries were taken for the estimations. (See Annex 1). The potential gains to developing countries from joining the APTA had been investigated since early 2000s (Pholphirul, 2006). Similar to that, the authors used the export demand function to forecast the potential effects for Mongolia after agreeing tariff concessions with the APTA countries. Theoretically, it is understood that the GDP, the geographical distance, and the trade-barriers are key factors that determine the export demand function.

a) This theoretical consideration is employed and export function is modelled so that it is determined by factors such as GDP, GDP per capita, tariffs, concessions etc.

X jt = f (GDPij, GDPPC j, Tariff ij, Concessionij)

Where:

X j – value of real exports from Mongolia to the APTA countries, GDP i – the GDP of the APTA countries,
GDPPC j – the GDP per capita of the APTA countries,
Concessionij –Margin of preferences implemented by APTA countries,
T ij –Time series data for period for 2005 – 2014.

The log-linear form of the partial adjustment models for export is specified as below:

$$ln\ X_t = \alpha_0 + \alpha_1\ ln\ GDP_{ij} + \alpha_2\ ln\ GDPPC_{ij} + \alpha_3\ ln\ Tariff_{ij} + \alpha_4\ Concessionij + \varepsilon$$

Where:

α1, α2 – elasticities of GDP and GDP per capita;
α3 – elasticity of average tariffs;
α4 – elasticity of tariff concessions.

The coefficient α4 is estimated to have a positive value, measuring the additional increase of export growth from a percentage of tariff reductions under the concessions. α4 is a key parameter, which is used to quantify the potential exports for Mongolia, according to tariff concessions. The authors predicted that the α4 coefficient will have a positive value while assuming that tariff reductions would increase the exports. The authors checked the pre-estimation and post-estimation tests before the estimation of the regression. For doing this, the correlation matrix

for all the explanatory variables was tested using GDP of APTA, GDP per capita of each APTA country and tariffs in same equation.

Table 3. Correlation matrix for Mongolia and the APTA countries. (STATA)

```
. correlate trade gdp_i gdp_j gdppc tariff_i tariff_j
(obs=60)
```

	trade	gdp_i	gdp_j	gdppc	tariff_i	tariff_j
trade	1.0000					
gdp_i	0.2306	1.0000				
gdp_j	0.9584	0.2235	1.0000			
gdppc	0.1373	0.3608	0.1589	1.0000		
tariff_i	0.1209	0.4942	0.1278	0.1630	1.0000	
tariff_j	-0.4801	-0.2246	-0.5418	-0.2252	-0.2021	1.0000

The correlation matrix explains that tariffs of the APTA countries are negatively correlated, while other factors are positively correlated. GDPs of APTA countries reveal most effects to trade flow of Mongolia.

Table 4 shows the Export Demand Functions for Mongolia from acceding to APTA and having tariff concessions at the fourth round. Regression is estimated by STATA 12 program. Model 1 calculates indicators like APTA's GDP, GDP per capita, tariff, tariff reductions using time series data for 2005-2014. The export demand functions are calculated for each APTA country, China (model 2), India (model 3), South Korea (Model 4), Sri-Lanka (model 5), Bangladesh (model 6), Lao (model 7), in particular.

Table 4. Export Demand Functions for APTA and member countries.

Ln(T_{ij})	(1) APTA	(2) China	(3) India	(4) RoK	(5) Sri Lanka	(6) Banglades	(7)
ln(GDP)	1.682	-4.200	-11.600	1.445 (0.70	-6.409 (0.648)	8.900 (0.019)	-14.998
ln(GDPPC)	-0.338	5.044 (0.41	14.061 (0.156)	-0.804	7.647 (0.617)	-8.866 (0.028)	-18.115
ln(tariffi)	-5.978	0.468 (0.82	1.220 (0.652)	2.032 (0.19	-3.362 (0.408)	1.640 (0.548)	-16.185
ln(tariffj)	0.441	-0.649	-0.063 (0.921)	-0.683	2.801 (0.380)	0.804 (0.230)	2.365 (0.547)
Concession	0.557 (0.00	5.336 (0.427)	17.281 (0.177)	-1.173 (0.76	6.75	-11.635 (0.021)	17.055 (0.440)

R-squared	0.94	0.97	0.99	0.99	0.4	0.96	0.94

The export demand function explains that all factors statistically significant except tariffs of APTA countries. As a result of estimations, the coefficient ln(GDP) equals to 1.682. This means, a percentage increase in the GDP of the APTA countries will increase the Mongolian export income by 1.682 percent. A percentage increase of APTA's GDP per capita will decrease the Mongolian export income by 0.338 percent. GDPs per capita of countries, except Sri-Lanka and Lao, show positive effects for Mongolia's export income.

A percentage increase in Mongolia's tariffs will decrease the Mongolian export income by 5.978 percent. But, a percentage increase in tariffs of the APTA countries will increase Mongolian export by 0.441 percent. Also, a percentage reduction of tariff concessions by the APTA countries will increase the Mongolian export by 0.557 percent.

The export demand function for Mongolia and China: the P values of tariffs for Mongolia and China are 0.826; 0.799. This means tariffs are less significant, while other values are statistically significant. A percentage increase in the GDP of China will decrease the Mongolian export income by 4.2 percent. However, a percentage increase in the GDP per capita of China will increase the Mongolian export income by 5.04 percent. A percentage increase in tariff concessions between China and Mongolia will increase the export income of Mongolia.

The export demand function for Mongolia and India: the P values of tariffs for Mongolia and India are 0.652; 0.826. This means tariffs are less significant, while other values are statistically significant comparing to tariffs of China. A percentage increase in GDP of India will decrease the Mongolian export income by 11.6 percent. However, a percentage increase in the GDP per capita of India will increase the Mongolian export income by 14.06 percent. A percentage increase in tariff concessions between India and Mongolia will increase the export income of Mongolia.

The export demand function for Mongolia and ROK: In this function, the P values of the GDP, the GDP per capita, and tariff concessions are insignificant. A percentage increase in the GDP of ROK will increase the Mongolian export income by 0.68 percent. As per Sri Lanka, the P values are almost same as ROK. However, Bangladesh and Laos revealed much more significant values to effect trade with Mongolia.

b) Secondly, the "Standard Gravity" model is used to investigate the scenario, if the GDP per capita and the

Distance factors affect Mongolia's trade with the APTA countries. The logarithmic function is set as below:

Log(tradeij) = bo + b1*log(gdppci) + b2*log(gdppcj) + b3*log(distij)

Where,

b1, b2 – Elasticity of the GDP per capita;

b3 – Elasticity of the distance between countries.

This model shows how the GDP per capita of the APTA countries and the distance between them influence the export income. The estimation has been carried out using the GDP per capita of each APTA country for the period of 2005-2014 and the distance between them. (See Annex - Panel data).

Table 5:

```
. reg ln_trade ln_gdppc_i ln_gdppc_j ln_dist, robust

Linear regression                               Number of obs =      60
                                                F(  3,    56) =  102.88
                                                Prob > F      =  0.0000
                                                R-squared     =  0.7521
                                                Root MSE      =  2.0232
```

ln_trade	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
ln_gdppc_i	.6659242	.4942686	1.35	0.183	-.3242147	1.656063
ln_gdppc_j	1.197951	.1740092	6.88	0.000	.8493688	1.546533
ln_dist	-5.119727	.3955277	-12.94	0.000	-5.912064	-4.32739
_cons	53.83418	4.250431	12.67	0.000	45.31955	62.34882

A result of an econometric equation model:

ln(tradeij) = 53.8 + 0.66*ln(gdppci) + 1.9*LOG(gdppcj) – 5.1*LOG(dictij)

p-value	0.000	0.183	0.000	0.000	
t-stat	12.67	1.35	6.88	-12.94	
					R^2=0.75

Regression is calculated with STATA 12 program and authors consider that the model is sufficient to trust. It explains that GDP per capita of Mongolia and APTA countries will have

positive effects for Mongolia's trade flow. However the distance between Mongolia and APTA countries would give negative effect. Equation result is explained as below:

The significant P values can be explained that regression is statistically sufficient.

A percentage increase of Mongolia's real GDP per capita will increase Mongolia's trade flow by 0.66 percent;

A percentage increase of GDP per capita of the APTA countries will increase Mongolia's trade flow by 1.9 percent;

c) After computing the "Standard Gravity" model, authors extended the Gravity model with more variables and dummies to analyze the key factors that affect the trade costs for Mongolia's trade flow. Trade costs are broadly defined, include all costs incurred in getting a good to other than the marginal cost of producing the good itself: transportation costs (both freight costs and tirne cost), policy barriers (tariffs and non-tariff barriers), information costs, contract enforcement costs, costs associated with the use of different currencies, legal and regulatory costs, and local distribution costs (wholesale and retail). (Anderson & Wincoop. 2004).

As Mongolia is a land locked country, authors assume that trade costs are key factors for Mongolia to expand its trade with the APTA countries. Thus, the standard gravity model was extended with more variables such as Mongolia's (GDP_exp); the APTA countries GDP (GDP_imp); the distance between Mongolia and each of the APTA countries (distij), tariffs (tariffij), entry costs by each of the APTA countries (entcostij), container costs (concostij); border crossing time (timeij), and dummy variables like border (border). The dummy variable is 0 or 1, depending on geographical situation. Thus, the authors assume that the coefficients a4 to a9 will be factors to affect trade flow. The data for the entry costs and container costs indexes are taken from the World Bank and other internationally established sources. (See Annex: Panel data). Hence, the logarithmic function is set as below:

$$\mathbf{Log(tradeij) = a0 + a1*log(gdpi) + a2*log(gdpj) + a3*log(distij) + a4*(tariffij) +}$$

$$\mathbf{a5*log(entcostij) + a6*(contcostij) + a7*(timeij) + a8*(border) + e}$$

Where:

a1; a2- the GDP elasticity coefficient; a3- the Distance elasticity coefficient; a4- the Tariff elasticity coefficient;

a5- the Entry cost elasticity coefficient;
a6- the Container cost elasticity coefficient;
a7- the dummy variable represents if the partner countries have a common border;

Table 6.

```
. reg ln_trade ln_gdp_i ln_gdp_j ln_dist tariff_i ln_con_cost ln_ent_cost ln_time
  concession border, robust cluster(dist)

Linear regression                               Number of obs =      60
                                                F(  4,     5) =       .
                                                Prob > F      =       .
                                                R-squared     =  0.9820
                                                Root MSE      =  .57675

                                    (Std. Err. adjusted for 6 clusters in dist)
------------------------------------------------------------------------------
             |               Robust
  ln_trade   |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
    ln_gdp_i |    1.249948   .3911431     3.20   0.024     .2444827    2.255414
    ln_gdp_j |    .8264381   .3112595     2.66   0.045     .0263202    1.626556
     ln_dist |   -2.472939   .2368455   -10.44   0.000     -3.08177   -1.864108
    tariff_i |   -.6413844   .3657058    -1.75   0.140    -1.581461    .2986924
 ln_con_cost |    -1.93568   1.516094    -1.28   0.258    -5.832924    1.961565
 ln_ent_cost |    .8913439   .4634039     1.92   0.112    -.2998736    2.082561
     ln_time |   -4.357294   3.863706    -1.13   0.311    -14.28927    5.574679
  concession |    .0767234    .190129     0.40   0.703    -.4120187    .5654654
      border |     2.89037   2.413611     1.20   0.285    -3.314014    9.094754
       _cons |     28.8145   20.89695     1.38   0.226    -24.90282    82.53182
------------------------------------------------------------------------------

. estat ovtest

Ramsey RESET test using powers of the fitted values of ln_trade
       Ho:  model has no omitted variables
                  F(3, 47) =      0.90
                  Prob > F =      0.4487
```

ln(tradeij) = 28.8+1.2*ln(gdpi) + 0.8*ln(gdpj) -2.5*ln(distij) – 0.6* ln(tariffij) +0.9*ln(entcostij) – 1.9*ln(concostij) -4.3*ln(timeij) +0.27*concession +2.9*border

R^2=0.91

1. Elasticities for the GDP and Distance (t-stat) are above Module 2, while other variables are incomplete
2. However, the P values for all variables except “Concessions” are statistically significant.

The average tariffs are calculated by below formula and regression is computed again employing the above Model inserting the values for tariffs of each exporting and importing countries.

$tariff_i$=(100+tariffi) - i country average tariff

$tariff_j$=(100+tariffj) - j country average tariff

For this scenario, the authors deleted some insignificant variables from the estimation.

Table 7.

```
. reg ln_trade ln_gdp_i ln_gdp_j ln_dist ln_tariff_i ln_ent_cost ln_con_cost
  concession, robust cluster(dist)

Linear regression                               Number of obs =        60
                                                F(  4,     5) =         .
                                                Prob > F      =         .
                                                R-squared     =    0.9814
                                                Root MSE      =    .57537

                                              (Std. Err. adjusted for 6 clusters in dist)
------------------------------------------------------------------------------
             |               Robust
    ln_trade |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      ln_gdp_i |   1.235474   .3571057     3.46   0.018     .3175046    2.153443
      ln_gdp_j |   1.150317   .0540604    21.28   0.000      1.01135    1.289283
       ln_dist |  -2.284728   .1077616   -21.20   0.000    -2.561738   -2.007718
  ln_tariff_i |  -3.807032   1.922821    -1.98   0.105      -8.7498    1.135736
  ln_ent_cost |   .3311398   .0204286    16.21   0.000     .2786265    .3836531
  ln_con_cost |  -3.230538   .8391391    -3.85   0.012    -5.387613   -1.073462
   concession |   .2731999   .0296518     9.21   0.000     .1969776    .3494222
        _cons |   16.41033   8.698777     1.89   0.118    -5.950585    38.77125
------------------------------------------------------------------------------
```

The regression estimation revealed statistically significant and comparatively good results. The values of each variable are above Module 2, and the P values are approximate to 0. Determination coefficient of the Model or R^2 is 98 percent. This allows the authors to trust the Model. Hence, it can be assumed that the variables in this Model are capable to explain the trade flow of Mongolia with the APTA countries.

ln(tradeij) = 16.4+1.2*ln(gdpi) + 1.1*ln(gdpj) -2.2*ln(distij) – 3.8* ln(tariffi)+0.3*ln(entcostij) – 3.2*ln(concostij) +0.27*concession

R^2=0.98

Following, is the outcome of the estimated Gravity Model (AvW2004);

A percentage increase of Mongolia's real GDP would increase Mongolia's export turnover by 1.2 percent;
A percentage increase of the GDP of the APTA countries would decrease Mongolia's export volume by 1.1 percent;
A percentage reduction of Mongolia's tariffs would increase Mongolia's trade flow by 3.8 percent;

A percentage increase of Mongolia's real GDP would increase Mongolia's export turnover by 1.2 percent;
A percentage reduction of tariff concessions with APTA countries would increase Mongolia's trade flow by 0.27 percent;

Conclusions

1. The analysis using the Spearman's rank correlation of comparative advantage for Mongolian exports identifies the following HS group products which have comparative export advantages to the APTA market. (HS 51, 26, 25, 41, 05, 71, 27 - Namely, the cashmere, fluorspar, copper, tungsten, molybdenum ores and concentrates, copper, coal, skins of camel, cattle, sheep and goat, camel wool, sheep and cattle wool, animal wool clothing, cashmere clothing, beef and horse meat). The Trade Intensity Index calculation also confirms that Mongolia has a high trading intensity to the APTA countries for natural resources and products of animal origin. Particularly, for China in the HS 51 group - "wool, animal hair, horse hair yarn and fabric thereof" and the HS 26 - "ore, concentration"; India – the HS 51 - "wool, animal hair, horse hair yarn and fabric thereof", ROK – the HS 26 - "ore, concentration"; Bangladesh – the HS 41 group "animal skin, haute", etc. Since Mongolia has limited categories of export products, it must change the pattern of export structure. Thus, Mongolia has to concentrate on developing the manufacturing clusters that would rely on the livestock raw materials and extractive industries and pursue certain strategies to attract investment for the manufacturing industries.

2. The export demand function explains that tariff concessions would allow an inverse effect on the Mongolian export income. A percentage reduction of Mongolia's tariffs would increase Mongolia's trade flow by 3.8 percent and a percentage reduction of tariff concessions with the APTA countries would increase Mongolia's trade flow by 0.27 percent. The Gravity model estimation explains that trade costs-related variables negatively affect Mongolia's exports to the APTA countries, such as "distance", "tariff" and "container costs". Therefore, these factors need to be addressed as part of Mongolia's policy implications. In an overall view, the authors make their conclusions stating that Mongolia will benefit from the accession to the APTA and that there is a real potential for the Mongolian export products to

enter the APTA market. However, it is recommendable for Mongolia to pursue the strong export diversification policy and diversify export products to gain more benefits from its accession to the APTA.

References

Anderson, J., and E. Van Wincoop (2003) "Gravity with Gravitas: A Solution to the Border Puzzle." *American Economic Review*, 93(1): 170-192.

Anderson, J. (1979) "A Theoretical Foundation for the Gravity Equation", *American Economic Review*, 1979, 69, 106-116.

Asian Development Bank (ADB) (2010), Asia Regiona Integration Center-Trade and Investment-FTA by country All, Retrieved from http://www.aric.adb.org/FTAbyCountryAll.php on May 14, 2010.

Bayoumi, T. and B. Eichengreen (1997), „Is Regionalism Simply a Diversion? Evidence from the Evolution of the EC and EFTA", in T. Ito and A. Krueger (eds.), *Regionalism versus Multilateral Trade*

Chen, N., and D. Novy (2011) "Gravity, Trade Integration, and Heterogeneity across Industries." *Journal of International Economics*, 85(2): 206-221.

Deardorff, A. (1995) "Determinants of Bilateral Trade: Does Gravity Work in a Neoclassical World?", *NBER Working Paper* 5377.

Enkhbold.V. "Northeast Asia coal market and Mongolia's export potentials", Economic Research Institute of Northeast Asia 3 (ERINA).Niigata. Japan. Study report 112th issue of 2013. Pages 62-65. (in English)

Otgonsaikhan N., Doljin M., Shim-Ui SUP (2014) The opportunity analysis of FTA between Mongolia and South Korea // Journal of International trade and Insurance, V.15(1),p.49-62, 2014

Pholphirul, P. (2006) "Potential Gains to Thailand from Joining the Bangkok Agreement", *NIDA Economic Review,* Vol. 1, No. 2, pp. 1-20.

Piriya Pholphirul. Analyzing the Benefits of Joining the Asia-Pacific Trade Agreement (APTA) for Malaysia, Thailand, and Vietnam. UNESCAP Trade & Investment Division. 74 pages.

Yamarik, S., and Ghosh, S. (2005), "A Sensitivity Analysis of the Gravity Model", *The International Trade Journal*, 19, 83-126.

WTO. A Practical Guide to Trade Policy Analysis Geneva. Published in 2012