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A Study on the Determinants of Free Trade Agreement in South Korea: Evidence from Asian Countries*

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Abstract

Purpose - Recently, large quantities of factors have affected the signing of the Free Trade Agreement between two countries. Due to this background, this paper selects South Korea as an example to explore the determinants of Free Trade Agreement from Asian countries.

Research design, data, and methodology - A cross sectional data of 2016 will be employed and some variables such as real income and GDP will be used to run an empirical analysis under the linear probability model, probit model and logit model.

Results - The findings show that the Asian countries' exchange rate regime, real income, GDP and so forth can increase the probability of signing the Free Trade Agreement with Asian countries. Conversely, the distance can lower the probability of signing the Free Trade Agreement with Asian countries. Meanwhile, although the Asian countries' import, consumer price index and population also can affect the probability of signing the Free Trade Agreement with Asian countries, the estimated coefficients are not statistically significant at 5% level.

Conclusions - According to the empirical results, this paper provides a new scope for South Korea's government to sign the Free Trade Agreement with other Asian countries.

Keywords: Free Trade Agreement, Determinants, Linear Probability Model, Probit Model, Logit Model.

JEL Classification: C19, C54, F11.

1. Introduction

With economy globalization, it is much easier for a country to engage in international economic activities. However, because of the state protectionism and tariffs, the international economic activities have been prevented. In order to break through regional protection and tariff barriers, the free trade agreement is signed as a policy tool to remove these barriers so as to conduct the international economic activities. The Free Trade Agreements are legally binding contracts between two or more countries, with the aim of promoting the economic integration. One of their objectives is to eliminate trade barriers (tariffs or complicated rules) and allow the free flow of products and services between countries. Since the last 1990s, South Korea as a developed country in Asia has always played an important role in launching the international economic cooperation. At present, the most effective way is to sign a Free Trade Agreement between two countries. The current situation of Free Trade Agreement between South Korea and Asian countries gives in Table 1.

As Table 1 shows, until today, South Korea has signed the Free Trade Agreement with thirteen countries in Asia. Moreover, South Korea and some international organizations are negotiating whether or not to sign the Free Trade Agreement. As a matter of fact, there are a quantity of factors that may impact South Korea on signing the Free Trade Agreement with other Asian countries.

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Table 1: Current Situation of South Korea's Free Trade Agreement with Asian Countries

Sector 1	Country	Sector 2	Country and Organization
Countries that have signed	India	Countries and organizations that are under negotiation	Korea-China-Japan FTA
	China		
	Turkey		RECP
	Singapore		
	Malaysia		Israel
	Indonesia		
	Thailand		ASEAN (additional liberalization)
	Philippines		
	Brunei		India CEPA (Improvement)
	Vietnam		
	Laos		China (Follow-up of Service and investment)
	Myanmar		
	Cambodia		

Note: www.fta.go.kr.

In this paper, we select some factors which are regarded as the determinants such as real GDP, exchange rate regime, import, export, foreign direct investment, distance, foreign exchange reserve, employment, real income, ratio of higher education input to GDP and ratio of manufacturing industry input to GDP that may affect the signing of the Free Trade Agreement with South Korea. Meanwhile, the linear probability model, the probit model and the logit model are employed to analyze the determinants of Free Trade Agreement in South Korea from Asian countries with as cross sectional data of 2016. Via the empirical analysis, the findings indicate that the local country's exchange rate regime, real income, GDP, export, foreign direct investment, foreign exchange reserve, employment, ratio of high education industry input to GDP and ratio of manufacturing industry input to GDP can rise up the probability of signing the Free Trade Agreement between South Korea and Asian countries. Conversely, the distance between South Korea and Asian countries can lower the probability of signing the Free Trade Agreement between South Korea and Asian countries. Meanwhile, although the Asian countries' import, consumer price index and population also can affect the probability of signing the Free Trade Agreement between South Korea and Asian countries, the estimated coefficients are not statistically significant at 5% level.

The remainder of this paper gives: Sector two focuses on the difference between this paper and others. Sector three mainly provides the methodology of this paper. Sector four presents the empirical analysis results of this paper. Sector five offers the conclusion of this paper.

2. Literature Review

The Free Trade Agreement has been regarded as the mainstream approach to promoting the regional economic integration. However, in reality, there are a great deal of factors that affect the signing of Free Trade Agreement between two countries. For this reason, a large number of scholars have been studied this proposition in different ways. Their results are shown as follows.

Yu, Cheng, and Yang (2010) employ the global trade analysis project model to simulate various scenarios of free trade in terms of China and Australia. They also try to evaluate the impact of the Free Trade Agreement on GDP and dairy trade. Their findings also provide some significant decision-making references for both countries' policy makers. Kitwiwattanachai, Nelson, and Reed (2010) applies the extension from a standard computable general equilibrium mode to study the Free Trade Agreement. They find that a preferred strategy for member regions is the East Asian Free Trade Agreement (multilateral agreement), which will yield higher gains in welfare and greater economic impacts than any of the other possible bilateral agreements between Association of Southeast Asian Nations and China, between Association of Southeast Asian Nations and Japan, between Association of Southeast Asian Nations and Korea. Lakatos and Walmsley (2012) emphasize the impacts of the reduction of barriers to trade on investment in a dynamic general computable equilibrium framework. They present and compare two alternative views or models of investment which yield different investment creation and diversion effects. Medvedev (2012) uses a comprehensive database of preferential trade agreements in a panel setting to investigate the effects of preferential trade agreements on net foreign direct investment inflows of member countries. Preferential trade agreements membership is related with a positive change in net foreign direct investment inflows and foreign direct investment gains increase with the market size of preferential trade agreements partners and their proximity to the host country.

Yang and Martinez-Zarzoso (2014) take use of the theoretically justified gravity model in terms of trade to study the effect of the Free Trade Agreement on exports between Association of Southeast Asian Nations and China. Their results indicate that the Free Trade Agreement between Association of Southeast Asian Nations and China leads to

substantial and significant trade creation. Thangavelu and Narjoko (2014) examine the impact of foreign direct investment flows into Association of Southeast Asian Nations in a gravity model using the bilateral foreign direct investment data from 2000 to 2009. Their empirical results indicate that the Free Trade Agreements have positive impact on foreign direct investment inflows. Wignaraja (2014) conducts the comparative and firm-level analysis of the determinants of Free Trade Agreement in Indonesia, Malaysia and Philippines. They find that the likelihood of firms using important Association of Southeast Asian Nations plus one Free Trade Agreements is positively associated with acquiring knowledge about Free Trade Agreements, building technological capabilities, and membership in industrial clusters. Chang and Xiao (2015) examine differences in welfare implications between free trade area and customs union for member countries differing in their market sizes. Their key findings show that unless the difference in market size is too large and rules of origin are too restrictive, a free trade area can be welfare-improving to countries with market size differential.

Leung (2016) attempts to examine the effect of Free Trade Agreements in terms of bilateral vertical specialization in manufacturing between United States and its trading partners. A bilateral vertical specialization variable is constructed using input-output analysis before being modeled in an augmented gravity equation. His findings show that North American countries are by far the most significant trade partners with the United States, followed by other Asian and Oceanic countries. The average treatment effect of a free trade agreement is 0.94, which shows that the bilateral trade increases, on average, by 155% from a free trade agreement. Missios, Saggi, and Yildiz (2016) also study this proposition. They find that customs is a negative factor that impacts the signing of Free Trade Agreement. Meanwhile, the Free Trade Agreement can induce the non-member to voluntarily decrease its import tariffs. Anderson and Yotov (2016) take use of the panel data gravity methods and the endowments general equilibrium model. They estimate the large Free Trade Agreements effects on bilateral trade volume in two digit manufacturing goods from 1990 to 2002. They find that some countries gain above five percentage of real manufacturing income, conversely, some lose less than 0.3 percentage. Global efficiency of manufactures trade rises 0.9% based on a distance function measure of iceberg melting.

Hayakawa, Kim, and Yoshimi (2017) investigate how exchange rates affect the utilization of a free trade agreement scheme considering the importance of rules of origin. Exchange rates affect exporters' compliance with rules of origin by changing the so-called value-added ratio, which is defined as the non-originating input price or export product price. They present theoretical underpinnings on this potential linkage with a model of pricing-to-market and provide an empirical examination using rich tariff-line-level data on the utilization of free trade agreement schemes in Korea's imports from the Association of Southeast Asian Nations countries. The theoretical framework proposes that a depreciation of exporters' currency against importers' currency enhances the free trade agreement utilization by improving the value-added ratio, and such effects are stronger for products with higher demand elasticity. Qi and Zhang (2018) attempt to examine both the causes and consequences of this delayed conclusion by running simulation experiments on a computable general equilibrium model, to see how the free trade agreement affects the world economy not only on the two countries involved, but also on the rest of the world with a particular reference to New Zealand. Based on the simulation results, policy implications are generated. Xiang, Kuang, and Li (2017) provide a comprehensive and prospective empirical analysis of the economic impacts of the China-Australian Free Trade Agreement on global coal output, trade, consumption and welfare by using a computable partial equilibrium model. Based on data from 2014, the simulated results indicate that the China-Australian Free Trade Agreement has a significant trade creation effect. The China-Australian Free Trade Agreement will increase Australia’s coal exports to China by 35.7% and China’s exports to Australia by 19.9%. However, the impacts of China-Australian Free Trade Agreement on global coal production and price are relatively limited. Results also demonstrate that the China-Australian Free Trade Agreement will cause an annual net welfare loss of US$ 200 million for China and a net welfare gain of US$ 569.3 million for Australia. Moreover, Chinese consumers and Australian coal producers are the biggest beneficiaries of China-Australian Free Trade Agreement.

Zhang, Cui, Li, and Lu (2018) draw on the institutional economics and the resource-based view to examine the impact of regional institutional changes on firm exports. Specifically, they treat the establishment of the China-Association of Southeast Asian Nations-Free Trade Area as an example. Their difference-in-difference analysis of a four-year panel of seven hundred China’s listed firms lends support to their arguments that regional institutional changes aimed at increasing economic incentives for intraregional business exchanges will stimulate firm exports in the regional market and that private firms, more technologically competent firms, and firms with richer regional exporting experience are affected more strongly by this institutional influence. Cui, Song, and Zhu (2018) study quantitatively analyzes the impact of a Free Trade Agreement among China, Japan, and South Korea using big data analytic. Using game theory and the computable general equilibrium approach, it proposes a compromise between two countries for agricultural protection, to reduce possible divergences and confrontations. Their findings show that game results differ among the three countries as per interest indexes. Compared to full tariff exemption, a Free Trade Agreement with agricultural protection not only

stimulates economic growth in the three countries but also reduces Japan and South Korea's agricultural concerns and impact on employment. They also evaluate the impacts of the trilateral Free Trade Agreement on manufacturing and services industries. Their results show that China will increase imports of energy-intensive products from Japan and South Korea, which may reduce domestic output and generate environmental benefits. Implementing the trilateral free trade agreement with agricultural protection may reduce carbon emission in Northeast Asia by 6.53 million tons. This study can promote economic integration in Northeast Asia and coping with climate change. Doan and Xing (2018) use a stochastic gravity model to estimate efficiency levels of Vietnam's exports with its major trading partners. Export efficiency is defined as the ratio of actual exports to the maximum possible volume. In addition, They also investigate the impact of Free Trade Agreements and rules of origin on export efficiency, focusing on Vietnam's exports to its major trading partners during the period from 1995 to 2013. Their empirical results suggest that the volume of Vietnam's actual exports is far below the estimated efficient level, and that there is considerable room for increasing Vietnam's exports. Those findings imply that Vietnam should enter more Free Trade Agreements with trading partners and adopt lenient rules of origin in Free Trade Agreement negotiations and that attracting export-oriented foreign direct investment and improving the mix of exports could enhance the country's trade efficiency substantially.

From the analysis of literature review, it can be known that a menu of scholars employ different varieties of methods such as the global trade analysis project model, theoretically justified gravity model and so forth to study the determinants of Free Trade Agreement of a country. In this paper, the linear probability model, the probit model and the logit model are employed to analyze the determinants of Free Trade Agreement in South Korea from Asian countries. Of course, this is also a biggest innovation of this paper.

3. Theoretical Framework

The Free Trade Agreement has broken the original national borders and regional boundaries to carry out more economic activities. It is a useful method to break down the Regional Protection Policy* which impedes the economic development. At present, the Free Trade Agreement is often treated as an important world-wide policy to promote the economic globalization and regional economic integration. A large number of countries have facilitated their own economic development by signing a Free Trade Agreement with other countries. Due to this context, this paper sets South Korea as an example to study the determinants of signing the Free Trade Agreement from Asian countries. Signing a Free Trade Agreement or not is a binary variable. Therefore, the paper will employ three econometric approaches (Linear Probability Model, Probit Model and Logit Model) to study the impact of some economic variables on signing a Free Trade Agreement with Asian countries.

The linear probability model with multiple regressors gives:

$$\begin{aligned} FTA = & \\ & \beta_0 + \beta_1 D(FERR)_i + \beta_2 \log GDP_i + \beta_3 \log EX_i + \beta_4 \log IM_i \\ & + \beta_5 \log FDI_i + \beta_6 \log DIS_i + \beta_7 \log POP_i + \beta_8 \log ERR_i \\ & + \beta_9 \log CPI_i + \beta_{10} \log EMP_i + \beta_{11} \log I.NC_i \\ & + \beta_{12} (\log LINC < 3.002)_i + \beta_{13} (3.002 < \log LMINC < 3.599)_i \\ & + \beta_{14} (3.559 < \log UMINC < 4.089)_i + \beta_{15} (\log HINC > 4.089)_i \\ & + \beta_{16} (R - HEI - GDP)_i + \beta_{17} (R - MII - GDP)_i \\ & + \beta_{18} D(FERR)_i \bullet \log GDP_i + \varepsilon_i \end{aligned} \tag{1}$$

FTA denotes a binary variable; β_0 denotes a constant, are coefficients; $\beta_1, \beta_2, \ldots \beta_{18}$ denote independent variables; $D(FERR), \log GDP, \ldots [D(FERR) \times \log GDP]$ denote independent variables; i denotes each country in Asia; ε denote the white noise.

The expected value gives:

$$\begin{aligned} & E[FTA | D(FERR)_i, \log GDP_i, \log EX_i, \log IM_i, \log FDI_i, \log DIS_i, \\ & \log POP_i, \log ERR_i, \log CPI_i, \log EMP_i, \log I.NC_i, (\log LINC < 3.002)_i, \\ & (3.002 < \log LMINC < 3.599)_i, (3.559 < \log UMINC < 4.089)_i, \\ & (\log HINC > 4.089)_i, (R - HEI - GDP)_i, (R - MII - GDP)_i, \\ & D(FERR)_i \times \log GDP_i] = \Pr[FTA = 1 | D(FERR)_i, \log GDP_i, \log EX_i, \\ & \log IM_i, \log FDI_i, \log DIS_i, \log POP_i, \log ERR_i, \log CPI_i, \log EMP_i, \\ & \log I.NC_i, (\log LINC < 3.002)_i, (3.002 < \log LMINC < 3.599)_i, \\ & (3.559 < \log UMINC < 4.089)_i, (\log HINC > 4.089)_i, (R - HEI - GDP)_i, \\ & (R - MII - GDP)_i, D(FERR)_i \bullet \log GDP_i] \end{aligned} \tag{2}$$

So for the linear probability model gives:

$$\begin{aligned} & E[FTA | D(FERR)_i, \log GDP_i, \log EX_i, \log IM_i, \log FDI_i, \log DIS_i, \\ & \log POP_i, \log ERR_i, \log CPI_i, \log EMP_i, \log I.NC_i, (\log LINC < 3.002)_i, \\ & (3.002 < \log LMINC < 3.599)_i, (3.559 < \log UMINC < 4.089)_i, \\ & (\log HINC > 4.089)_i, (R - HEI - GDP)_i, (R - MII - GDP)_i, \\ & D(FERR)_i \times \log GDP_i] \\ & = \beta_0 + \beta_1 D(FERR)_i + \beta_2 \log GDP_i + \beta_3 \log EX_i + \beta_4 \log IM_i + \beta_5 \log FDI_i \\ & + \beta_6 \log DIS_i + \beta_7 \log POP_i + \beta_8 \log ERR_i + \beta_9 \log CPI_i + \beta_{10} \log EMP_i \\ & + \beta_{11} \log I.NC_i + \beta_{12} (\log LINC < 3.002)_i \\ & + \beta_{13} (3.002 < \log LMINC < 3.599)_i + \beta_{14} (3.559 < \log UMINC < 4.089)_i \\ & + \ldots + \beta_{18} D(FERR) \bullet \log GDP_i + \varepsilon_i] \end{aligned} \tag{3}$$

The regression coefficient β_i is the change in the probability that $FTA = 1$ associated with a unit change in $D(FERR)_i$, holding constant the other regressors, and so forth for $\beta_2, \beta_3, \ldots, \beta_{18}$.

The population probit model with multiple regressors gives:

* Regional Protection Policy: it is a kind of macro-control whose purpose is to implement the policy intention of the central government's macro-control, enhance the marginal use efficiency of fiscal funds and promote the effective allocation of resources.

$$\Pr[FTA=1|D(FERR)_i, \log GDP_i, \log EX_i, \log IM_i, \log FDI_i, \log DIS_i, \log POP_i, \log ERR_i, \log CPI_i, \log EMP_i, \log I.NC_i, (\log LINC<3.002)_i, (3.002<\log LMINC<3.599)_i, (3.559<\log UMINC<4.089)_i, (\log HINC>4.089)_i, (R-HEI-GDP)_i, (R-MII-GDP)_i, D(FERR)_i \bullet \log GDP_i] = \Phi[\beta_0+\beta_1 D(FERR)_i+\beta_2\log GDP_i+\beta_3\log EX_i+\beta_4\log IM_i+\beta_5\log FDI_i+\beta_6\log DIS_i+\beta_7\log POP_i+\beta_8\log ERR_i+\beta_9\log CPI_i+\beta_{10}\log EMP_i+\beta_{11}\log I.NC_i+\beta_{12}(\log LINC<3.002)_i+\beta_{13}(3.002<\log LMINC<3.599)_i+\beta_{14}(3.559<\log UMINC<4.089)_i+....+\beta_{17}(R-MII-GDP)_i+\beta_{18}D(FERR)_i \bullet \log GDP_i+\varepsilon_i] \quad (4)$$

Where the dependent variable FTA is binary; Φ is the cumulative standard normal distribution function, and $D(FEER)_i$, $\log GDP_i$,..., $D(FERR)_i \bullet \log GDP_i$ are regressors. The model is best interpreted by computing predicted probabilities and the effect of a change in a regressor. The predicted probability that $FTA=1$, given values of $D(FEER)_i, \log GDP_i, \cdots$, $D(FERR)_i \bullet \log GDP_i$, is calculated by computing the $z-value$, $z-value=\beta_0+\beta_1 D(FERR)_i+\beta_2\log GDP_i+...+\beta_{18}D(FERR)_i \bullet \log GDP_i$, and then looking up this $z-value$ in the normal distribution table. The coefficient β_1 is the change in the arising from a unit change in $z-value$, holding constant $D(FEER)_i, \log GDP_i, ..., D(FERR)_i \bullet \log GDP_i$. The effect on the predicted probability of a change in a regressor is computed by (1) computing the predicted probability for the initial value of the regressors, (2) computing the predicted probability for the new or changed value of the regressors, and (3) taking their difference.

The population logit model of the binary dependent variable FTA with multiple regressors gives:

$$\Pr[FTA=1|D(FERR)_i, \log GDP_i, \log EX_i, \log IM_i, \log FDI_i, \log DIS_i, \log POP_i, \log ERR_i, \log CPI_i, \log EMP_i, \log I.NC_i, (\log LINC<3.002)_i, (3.002<\log LMINC<3.599)_i, (3.559<\log UMINC<4.089)_i, (\log HINC>4.089)_i, (R-HEI-GDP)_i, (R-MII-GDP)_i, D(FERR)_i \bullet \log GDP_i] = F[\beta_0+\beta_1 D(FERR)_i+\beta_2\log GDP_i+...+\beta_{18}D(FERR)_i \bullet \log GDP_i] = \frac{1}{1-e^{-[\beta_0+\beta_1 D(FERR)_i+\beta_2\log GDP_i+...+\beta_{18}D(FERR)_i \bullet \log GDP_i]}} \quad (5)$$

The logit regression is similar to probit regression except that the cumulative distribution function is different.

4. Empirical Analysis

4.1. Basic Model

The model used in this paper is a combination of linear probability model, probit model and logit model. The general form gives:

$$\Pr(FTA=1)=\beta_0+\beta_1 D(FERR)_i+\beta_2\log GDP_i+\beta_3\log EX_i+\beta_4\log IM_i+\beta_5\log FDI_i+\beta_6\log DIS_i+\beta_7\log POP_i+\beta_8\log ERR_i+\beta_9\log CPI_i+\beta_{10}\log EMP_i+\beta_{11}\log I.NC_i+\beta_{12}(\log LINC<3.002)_i+\beta_{13}(3.002<\log LMINC<3.599)_i+\beta_{14}(3.559<\log UMINC<4.089)_i+\beta_{15}(\log HINC>4.089)_i+\beta_{16}(R-HEI-GDP)_i+\beta_{17}(R-MII-GDP)_i+\beta_{18}D(FERR)_i \bullet \log GDP_i+\varepsilon_i \quad (6)$$

Where FTA is a binary variable (If FTA is equal to one, South Korea has signed FTA with country i. Conversely, if FTA is equal to zero, South Korea does not have signed FTA with country i.). $D(FERR)_i$ is the floating exchange rate regime (if country i implements the floating exchange rate regime, the value of is one. Otherwise, the value of $D(FERR)_i$ is zero). GDP_i denotes the gross domestic products of country i; EX_i denotes the total amount of export from South Korea to country i; IM_i denotes the total amount of import from South Korea to country i; FDI_i denotes the foreign direct investment from South Korea to country i; DIS_i denotes the distance from South Korea to country i; POP_i denotes the population of country i; FER_i denotes the foreign exchange reserve of country i; CPI_i denotes the consumer price index of country i; EMP_i denotes the employment figure of country i; $I.NC_i$ denotes the real GDP per capita of country i; $LINC_i$ denotes the low income countries; $LMINC_i$ denotes the low and middle income countries; $UMINC_i$ denotes the upper middle income countries; $HINC_i$ denotes the high income countries; $(R-HEI-GDP)_i$ denotes the ratio of higher education input of GDP; $(R-MII-GDP)_i$ denotes the ratio of manufacturing input of GDP; $D(FEER)_i \bullet \log GDP_i$ denotes the product of $D(FERR)_i$ and $\log GDP_i$; β_0 is a constant, $\beta_1, \beta_2, ..., \beta_{18}$ are coefficients; ε_i is the white noise.

4.2. Variable Description

The most important variables available to South Korea via the economic variables in Asian countries' data set are listed in Table 2.

The most important variables available to South Korea's government and country i through signing the Free Trade Agreement in the Asian data set are listed in Table 2. These are the variables we will focus on in the empirical models of whether South Korea signs the Free Trade Agreement or not with country i.

4.3. Regrssion Results

A part of variables used in this paper are statistically processed by taking the logarithm. Then, the linear probability model, the logit model and the probit model will be used to conduct an empirical analysis. The empirical results show in Table 3.

Table 2: Variables Included in Regression Models of Signing the Free Trade Agreement Decisions

Variable	Definition
$D(FERR)$	If the country implements the floating exchange rate, the value will be one; otherwise, the value will be zero
$\log GDP$	Real GDP of each country
$\log EX$	Volume of export between South Korea and each country
$\log IM$	Volume of import between South Korea and each country
$\log FDI$	Foreign direct investment of South Korea in each country
$\log DIS$	Distance from South Korea's capital to each country's capital
$\log POP$	Population of each country
$\log FER$	Foreign exchange reserve of each country
$\log CPI$	Consumer price index of each country
$\log EMP$	Employment figure of each country
$\log I.NC$	Real income of each country which is represented by real DGP per capita.
$\log LINC$	Low Income ($\log LINC < 3.002$)
$\log LMINC$	Low and Middle-income ($3.002 < \log LMINC < 3.599$))
$\log UMINC$	Upper middle income $3.599 < \log UMINC < 4.089$)
$\log HINC$	High Income $\log HINC > 4.089$
$R-HEI-GDP$	Real value of ratio of higher education input to GDP
$R-MII-GDP$	Real value of ratio of manufacturing industry to GDP
$D(FERR) \bullet \log GDP$	Product of floating exchange rate regime and real GDP

Note: All data used in this paper are soured from World Bank, National Bureau of Statistical of each country, Organization for Economic Co-operation and Development and United National related databases. Income standard satisfies the standard of World Bank.

Table 3: Signing the Tree Trade Agreement Regression Using the Asian Countries Data

Dependent variable: Signing=1 if South Korea signs the Free Trade Agreement with country i; Signing=0 if South Korea does not sign the Free Trade Agreement with country i; 672 observations.					
Regression Model Regressor	**LPM (1)**	**Logit (2)**	**Probit (3)**	**Probit (4)**	**Probit (5)**
$D(FERR)$	0.089***	0.711***	0.412***	0.392***	0.287***
	(0.015)	(0.127)	(0.112)	(0.081)	(0.055)
	[5.933]	[5.598]	[3.679]	[4.840]	[5.218]
$\log I.NC$	0.059	0.557	0.532	0.375	0.448
	(0.042)	(0.452)	(0.437)	(0.481)	(0.597)
	[1.405]	[1.232]	[1.217]	[0.780]	[0.750]
$\log LINC$	0.049***	0.481***	0.257***	0.356***	0.366***
	(0.011)	(0.113)	(0.058)	(0.089)	(0.091)
	[4.455]	[4.257]	[4.431]	[4.001]	[4.022]
$\log LMINC$	0.058***	0.599***	0.361***	0.325***	0.355***
	(0.015)	(0.116)	(0.072)	(0.081)	(0.082)
	[3.867]	[5.164]	[5.014]	[4.012]	[4.329]
$\log UMINC$	0.072***	0.744***	0.394***	0.411***	0.436***
	(0.019)	(0.201)	(0.093)	(0.087)	(0.089)
	[3.789]	[3.701]	[4.237]	[4.724]	[4.899]
$\log HINC$	0.173***	1.453***	0.883***	0.886***	0.887***
	(0.042)	(0.337)	(0.161)	(0.153)	(0.162)
	[4.119]	[4.312]	[5.484]	[5.791]	[5.475]
$\log GDP$	0.592***	5.532***	2.228**	2.631***	2.726***
	(0.131)	(0.915)	(0.678)	(0.552)	(0.722)
	[4.519]	[6.046]	[3.286]	[4.766]	[3.776]
$\log EX$	0.153***	1.982***	1.541***	1.134***	1.372***
	(0.033)	(0.262)	(0.191)	(0.135)	(0.138)
	[4.636]	[7.565]	[8.068]	[8.403]	[9.942]
$\log IM$	-0.073	-0.776	-0.391	-0.362	-0.344
	(0.051)	(0.414)	(0.282)	(0.191)	(0.188)
	[-1.431]	[-1.874]	[-1.387]	[-1.895]	[-1.830]
$\log FDI$	0.035	0.261***	0.293***	0.271	0.282
	(0.019)	(0.043)	(0.062)	(0.164)	(0.164)
	[1.842]	[6.070]	[4.725]	[1.652]	[1.720]

$\log DIS$	-0.017** (0.006) [-2.833]	-0.196*** (0.031) [-6.323]	-0.154** (0.062) [-2.484]	-0.169** (0.055) [-3.073]	-0.171** (0.049) [-3.490]
$\log POP$	0.025 (0.017) [1.471]	0.281 (0.192) [1.464]	0.177 (0.187) [0.947]	0.158 (0.153) [1.033]	0.179 (0.185) [0.968]
$\log FER$	0.356*** (0.096) [3.708]	3.679*** (0.499) [7.373]	2.547*** (0.486) [5.241]	2.675*** (0.491) [5.448]	2.777*** (0.484) [6.185]
$\log CPI$	-0.019 (0.015) [-1.267]	-0.183*** (0.043) [-4.256]	-0.105** (0.031) [-3.387]	-0.099 (0.116) [-0.596]	-0.102 (0.141) [-0.723]
$\log EMP$	0.223* (0.081) [2.753]	2.515*** (0.386) [6.516]	1.981*** (0.391) [5.066]	2.016*** (0.397) [5.078]	2.125*** (0.389) [5.463]
$R-HEI-GDP$				0.533*** (0.096) [5.552]	0.534*** (0.094) [5.681]
$R-MII-GDP$				0.851*** (0.162) [5.253]	0.851*** (0.162) [5.253]
$D(FERR) \bullet \log GDP$					1.554 (1.649) [0.917]
Constant	1.572*** (0.253) [6.213]	3.226** (0.945) [3.414]	2.743*** (0.298) [9.205]	2.214*** (0.301) [7.355]	2.546** (0.779) [3.268]

Note: ( ) indicates the standard error. [ ] indicates the statistic value.

Table 3 provides regression results which are based on these variables. The base specifications, reported in columns (1) through (3), include the income variables plus the macroeconomic variables indicating whether the Free Trade Agreement is signed. At present, most governments commonly employ the cutoff values, for real income, so the base specification for that variable uses binary variables for whether the income is high (>4.089), upper middle (>3.599 and <4.089), low and middle (>3.003 and <3.599), or low (>3.002). This case is omitted to avoid perfect multicollinearity. The regressor in the first three columns are similar. The regressions in columns (1) through (2) differ only in how the acceptance probability of signing the Free Trade Agreement is modeled, using a linear probability model, a logit model, and a probit model, respectively.

Because the regression in column (1) is a linear probability model, its coefficients are estimated changes in predicted probability arising from a unit change in the dependent variable. Accordingly, an increase in real income of 0.1 is estimated to increase the probability of signing the Free Trade Agreement by 0.59 percentage points (the coefficient on real income in column (1) is 0.059, and (0.059×0.1=0.0059). Similarly, having a large real income increases the probability of signing the Free Trade Agreement. The real income lowering 3.002 is associated with an 0.49 percentage point increase (the coefficient is 0.049) in the probability of signing the Free Trade Agreement. The real income between 3.002 and 3.599 is associated with an 0.58 percentage point increase (the coefficient is 0.058) in the probability of signing the Free Trade Agreement. The real income between 3.599 and 4.089 is associated with an 0.72 percentage point increase (the coefficient is 0.072) in the probability of signing the Free Trade Agreement. The real income exceeding 4.089 is associated with an 1.73 percentage point increase (the coefficient is 0.173) in the probability of signing the Free Trade Agreement. A country with a low real income also has a more difficult time signing the Free Trade Agreement, all else being constant. The coefficient on floating exchange rate in regression (1) is 0.089, indicating that the difference in acceptance probabilities for floating exchange rate and others is 8.9 percentage points, holding constant the other variables in the regression. This is statistically at the 1% significance level (t=5.933). an increase in GDP, export, foreign direct investment, foreign exchange reserve and employment of 0.1 are estimated to increase the probability of signing the Free Trade Agreement by 5.92, 1.53, 3.58, 3.56 and 2.33 percentage points. However, the impact of import, population and consumer price index on signing the Free Trade Agreement between two countries is not statistically significant.

The logit and probit estimates reported in columns (2) and (3) yield similar conclusions. The regressions in columns (4) through (5) investigate the sensitivity of the results in column (3) to changes in the regression specification. Column (4) modifies column (3) by including additional

characteristics that may affect on signing the Free Trade Agreement between two countries. These characteristics help to predict whether the Free Trade Agreement between two countries is signed (the estimate is positive and the coefficient is statistically significant at the 1%). However, controlling for these characteristics does not change the estimated coefficient on floating exchange rate regime or the estimated difference in acceptance probabilities in an important way. Column (5) examines whether there are interactions. The result show that the coefficient of a country with a floating exchange rate regime is not statistically significant.

5. Conclusion

With the deepening of economic globalization, the distance between two countries has become more and more closed. Simultaneously, the Free Trade Agreement plays an important role in promoting the regional economic integration. Based on this background, this paper sets South Korea as an example to explore the determinants of Free Trade Agreement with a cross sectional data in Asian countries. Meanwhile, the linear probability model, the probit model and the logit model will be employed to conduct an empirical analysis. The results show that the Asian countries' exchange rate regime, real income, GDP, export, foreign direct investment, foreign exchange reserve, employment, ratio of high education industry input to GDP and ratio of manufacturing industry input to GDP can rise up the probability of signing the Free Trade Agreement between South Korea and Asian countries. Conversely, the distance between South Korea and Asian countries lowers the probability of signing the Free Trade Agreement between South Korea and Asian countries. Meanwhile, although the Asian countries' import, consumer price index and population also can affect the probability of signing the Free Trade Agreement between South Korea and Asian countries, the estimated coefficients are not statistically significant at 5% level.

According to the empirical evidences this paper provides, some suggestions will be proposed as follows. The first is that the distance between two countries is still a block for two countries to sign the Free Trade Agreement. Therefore, both countries can increase the transportation industry construction so as to lower the transportation cost, which can increase the probability of signing the Free Trade Agreement between two countries. The second is that the related countries should implement the exchange rate regime reform, because the floating exchange rate regime can increase the probability of signing the Free Trade Agreement between two countries. The third is that the related countries should adjust the tax policy so as to enlarge the real income, because an increase in the real income can increase the probability of signing the Free Trade Agreement between two countries. The fourth is that the related countries should vigorously develop their economy, because an increase in the real GDP can increase the probability of signing the Free Trade Agreement between two countries. The fifth is that the related countries expand their export volume, because an increase in the export can increase the probability of signing the Free Trade Agreement between two countries. The sixth is that the related countries should increase their foreign direct investment, because an increase in the foreign direct investment can increase the probability of signing the Free Trade Agreement between two countries. The seventh is that the related countries lower their unemployment rate, because an increase in the employment can increase the probability of signing the Free Trade Agreement between two countries. The eighth is that the related countries should enlarge the amount of foreign exchange reserve, because an increase in the foreign exchange reserve can increase the probability of signing the Free Trade Agreement between two countries. The ninth is that the related countries should enlarge the high education input and the manufacturing input, because an increase in both of them can increase the probability of signing the Free Trade Agreement between two countries.

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