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THE DESIRABILITY OF A VIETNAM-JAPAN FREE TRADE AGREEMENT: THE GRAVITY MODEL APPROACH

A Policy Proposal Paper
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Tokyo, July 29th, 2005

Abstract

This study, prepared as a graduation paper at the master's level at the National Graduate Institute for Policy Study (GRIPS), explores a quantitative method using the gravity model to find appropriate partners for Vietnam's free trade agreement (FTA) strategy. It investigates the capacity of a Japan-Vietnam FTA to improve trade for both countries. Focusing on the advantage of trade between Japan and Vietnam, I examine their relations in comparison with world trade relations and explore their potential trade. Although Vietnam does not appear on Japan's FTA priority list, the study finds that an FTA between Vietnam and Japan may be an appropriate policy on the basis of trade interest. Among the 13 nations examined, other potential FTA partners suggested for Vietnam include Singapore, Egypt and large economies in the Asia-Pacific region.

Key words: FTA, Vietnam-Japan FTA, Gravity model

Abbreviations

APEC   Asia-Pacific Economic Cooperation
ASEAN   Association of Southeast Asian Nations
CIA   Central Intelligence Agency
EU   European Union
FDI   Foreign Direct Investment
FTA   Free Trade Agreement
GDP   Gross Domestic Product
GDPCAP   Gross Domestic Product Per Capita
GSP   Generalized System of Preferences
IMF   International Monetary Fund
LANG   Language
NAFTA   North American Free Trade Agreement
NIEs   Newly Industrialized Economies
OLS   Technique of Ordinary Least Square
TCI   Trade Conformity Index
Trt   Trade Treatment
WTO   World Trade Organization

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Introduction

Free trade agreements (FTAs) between two countries or among more than two associated countries have gained popularity in the world since the 1995 establishment of the World Trade Organization (WTO), although such agreements did exist previously. Many researchers hold the view that with the liberal world as it today, when the WTO fails to fulfill its task of trade liberalization, FTAs will be an appropriate policy (Ichimura and Ando 2005). In this trend, any country that does not actively integrate into the world's economy will be left behind.

In the Asia-Pacific region, many countries like Mexico, Japan, Thailand, Singapore, and Korea have actively engaged in FTAs and have recorded many initial achievements in both the economic and political fields. The North American Free Trade Agreement (NAFTA) is estimated to have increased intra-region trade by 8.0% from the baseline, leading to a welfare gain of 0.1% of gross domestic product (GDP) for the United States and 5.0% of GDP for Mexico (Lee 2004). Scollay and Gilbert (2001) estimate that a Japan-Korea-China FTA would generate welfare gains of 0.25% of GDP for Japan, 0.80% of GDP for Korea, and 2.1% of GDP for China. Urata and Kiyota (2003) expect that an East Asian FTA including China, Japan, Asian newly industrialized economies (NIEs), and the Association of Southeast Asian Nations (ASEAN) would produce welfare gains ranging from 0.19% of GDP for Japan to 12.5% of GDP for Thailand. McKibbin, Lee, and Cheong (2004) show that gains for Korea and Japan from a bilateral FTA would reach about 0.1–0.2% of GDP per year for both countries.

However, FTAs cannot be fruitful for every country, due largely to the different characteristics of each country involved and the strategies used to choose the sector and partners. Japan, Korea, and India have run many gravity analyses to assess potential partners for FTAs. For example, Choi (2001) has run a gravity analysis test to determine the potential for an FTA between Korea and the U.S. Bratra (2004) used gravity analysis to look for potential partners for India, and Sohn (2005) applied the gravity model to look for potential FTA partners for Korea. In almost all analyses, the researchers used the set observation of N x N country pairs except for Sohn (2005), who said, "It is surprising how little work has been done on examining whether the gravity equation fits to trade flows of a specific country. Most previous researchers dealt with the trade volumes of country-pairs in N x N countries setting, thereby leaving out the single country case of N x 1 setting uninvestigated"(p. 3).

Vietnam is currently at the low level of a developing country in the world, but is still aware of the need to create a more open economic environment to lay a firm foundation to integrate itself into world development. In a new effort, in addition to actively negotiating for WTO accession, the Vietnamese government has prepared for free trade agreements with other nations and associations by setting up a research committee on free trade agreements, which comprises representatives of various ministries and agencies under the chairmanship of the Ministry of Trade.

Much research and many conferences in Vietnam have concentrated on the FTA situation in the world and the need for and impact of FTAs on Vietnam, but very few detailed studies have been done on specific cases in FTA negotiation, so analyses by econometric calculation on the potential partners are lacking. Such analysis is regarded as

the key element for successfully coming to an agreement because if Vietnam cannot determine its appropriate partners, FTAs cannot bring the desired achievements and may even harm the vulnerable economy.

With the aim of providing a practical contribution for Vietnam in future FTA negotiation, this policy proposal applies the gravity model for trade flow to determine whether Japan can be an appropriate partner for an FTA with Vietnam, and if not, which country has potential as a partner for Vietnam. The capacity for a Vietnam-Japan FTA will be high if their bilateral FTA forecasts a chance to improve bilateral trade, which I have investigated by assessing the current trade relations and determining whether their actual bilateral trade volume is below or above their potential trade volume.

Due to the availability of data collected, my study is like many other studies that only run gravity model analysis on commodity goods but ignore services, even though real free trade agreements sometimes cover the services sector.

Methodology

Most researchers use the gravity model equation specified by Tinbergen (1962) and Poyhonen (1963) as follows:

$$Trade_{ij} = \frac{\alpha * GDP_i * GDP_j}{Dis\tan ce_{ij}} \ .$$

This equation means that the trade relations between two countries can be measured by the GDP of each country and the distance between them. This is similar to Newton's law of gravity.

Frankel (1997) later developed this model and credited Helpman and Krugman (1985) for the standard one. His equation came to that:

$$log(\ trade_{ij}\ ) = \alpha + \beta_1\ log(\ GDP_i * GDP_j\ ) + \beta_2\ log(\ GDPcap_i * GDPcap_j\ ) + \beta_3\ log(\ dis\tan ce_{ij}\ )$$
$$+ \beta_4 Lang_{ij} + \beta_5 Adj_{ij} + \lambda Dummy + u_{ij},$$

where

- $lang_{ij}$ is a dummy variable that takes the value of 1 if two countries have the same language and is otherwise 0 and

- Adj_{ij} is a dummy variable that takes the value of 1 if two countries share a border and is otherwise 0.

Later, Sohn (2005) added the dummy variable of TCI—the trade conformity index between Korea and its trading partners (applied country set of N x 1). The TCI built by Gornmely and Morrill (1998) ranges from 0 (perfectly competitive trade structure) to 1 (perfectly supplemental trade structure) and is calculated by

$$TCI_{ij} = \sum \{X_{ki} \times M_{kj}\} / \sqrt{\left[\sum X_{ki}^2 + \sum M_{kj}^2\right]},$$

where

- i and j are a country and its trade partner,

- k is a commodity group using the 3-digit SITC commodity,

- X_{ki} is the share of commodity group k in the exports of country i, and

- M_{kj} is the share of commodity group k in the imports of country j.

Although this dummy variable is very useful for analysis, due to limited time and capacity, it was not applied in this study.

Many other recent researchers using this model to predict trade potential have included many other dummies such as colony relationship (Lee 2004), which means the countries shared the same colonizer or one used to colonize the other; culture share (Choi 2001); organization, which means the two countries belong to the same economic or political organization (Porojan 2000); and security (Choi 2001), which means that one country has one or more military base in the other.

If a country wants to develop its trade volume, that country must overcome the problems of culture, language, security, and organization. Only organizations focus on tax reductions, and/or create a dynamic environment for economic activities may actually facilitate trade. Besides, little research takes into account the value of preferential trade treatment between two countries even though this factor strongly affects their trade relations.

This study therefore uses the following equation to estimate the trade flows of the 14 countries in the data set.

(1)

$$log(trade_{ij}) = \alpha + \beta_1 log(GDP_i * GDP_j) + \beta_2 log(GDPcap_i * GDPcap_j) + \beta_3 log(dis\tan ce_{ij})$$
$$+ \beta_4 Apec + \beta_5 trt + \beta_6 language + \lambda_1 country + u_{ij} ,$$

where

- the country variable takes the value of 1 if the pair of nations includes a particular country and 0 if it does not,

- the Asia-Pacific Economic Cooperation (APEC) dummy variable takes the value of 1 if both countries are APEC members and 0 if they are not,

- the trt dummy variable represents trade treatment, and takes the value of 0 if both countries have not signed any trade agreement, 1 if they have a trade agreement or grant each other most favored nation (MFN) status, and 2 if they have signed an FTA or granted preferential treatment such as generalized system of preferences (GSP) for the partner, and

- the language dummy variable takes the value of 1 if both countries generally use the same language and 0 if not.

The second and third equations are used to analyze the bilateral trade between two countries in the case of their economic integration into an FTA as applied by Choi (2001) in his research.

(2)

$$\log(trade_{ij}) = \alpha + \beta_1 \log(GDP_i * GDP_j) + \beta_2 \log(GDPcap_i * GDPcap_j) + \beta_3 \log(dis\tan ce_{ij})$$
$$+ \lambda_1 bloc + u_{ij}$$

(3)

$$log(trade_{ij}) = \alpha + \beta_1 log(GDP_i * GDP_j) + \beta_2 log(GDPcap_i * GDPcap_j) + \beta_3 log(dis\tan ce_{ij})$$
$$+ \lambda_1 bloc + \lambda_2 Bloc\_openness + u_{ij},$$

where

- the bloc variables take the value of 1 if both countries are in the bloc and 0 if they are not and

- the Bloc _ openness variables take the value of 1 if the pair includes a country in the bloc and 0 if it does not.

The fourth equation uses the data set of N x 1 with the fixed variable of Vietnam to explore the trade flow of Vietnam with its partners by comparing the predicted and actual trade. Based on this analysis, I recommend potential FTA partners for Vietnam, paying particular attention to Japan.

(4)

$$\log(trade_{i\_VN}) = \alpha + \beta_1 \log(GDP_i * GDP_{VN}) + \beta_2 \log(GDPcap_i * GDPcap_{VN}) + \beta_3 \log(dis\tan ce_{i\_VN})$$
$$+ \lambda_1 TrT + \lambda_2 Apec + \lambda_3 Language + u_{ij}$$

This study applies the widely used gravity model developed by Jeffrey A. Frankel (1997) to find the potential partners for Vietnam in its FTA strategy, using gravity analysis based on the country settings of both N x N and N x 1. While many researchers such as Frankel (1997), Choi (2001) and Batra (2004) have used the country setting of N x N, only a few researchers such as Sohn (2005) have used the country setting of N x 1. Although many researchers use data from only one year, as have Frankel (1997), Choi (2001), Batra (2004), and Sohn (2005), I have used data from the 7 years from 1997 to 2003 with the frequency of 2 years.

The model applied in this study, in short, analyzes two factors. First, the country dummy was examined to explore the trade capacity of interested countries, and then a bloc of interested countries was compared with other blocs. Second, in the data set of Vietnam and its 13 trading partners, I considered the gap between the trading figures estimated by the model and the actual ones to infer future trade.

The model, however, is not perfect: economic size, the distance between trading countries, and other factors facilitating trade such as language, trade treatment, and the role of region are important for trade but are not the only factors we should consider. Still, these factors may well reflect the traditional trade when commodities are produced in one

nation and then exported to other nations and when trading partners pay high transaction costs, so the model can reflect some part of trade flow.

However, some other activities also affect trade, for example, a foreign company might set up factories in targeted countries to produce items locally instead of exporting to these countries, creating a substitution effect for trade (Ohno 2005), on-line trade can be done quickly and at low cost, and the figures of TCI affect relationships as stated above. These figures are not included in the model, so analyses may be biased.

This study uses the ordinary least square (OLS) technique for all estimations because this technique holds various factors constant when assessing the effects of other factors.

Data

The dependent variable in my test is the total bilateral trade volume (export plus import, measured in billions of USD) between the country pairs in logarithm form. The figures used are those published by the IMF for 2004—the latest trade figures.

The two independent variables of GDP and GDP per capita (GDPCAP) are also in logarithm form. This data was found on the IMF website in millions of USD for GDP and in USD for GDPCAP. In theory, the trade volume between two countries is positively related to their economic size.

The other independent variable of distance between the two countries in the pair is also in logarithm form. The data is taken from a website of Indonesia and Bali for Indo.com Corporation. The distance between the countries in the pairs is the gap between their capitals and is measured in miles, except for the EU, for which I have assumed the capital to be Belgium. The distance variable should be negatively related to trade volume, as longer distance between two countries can raise the transaction costs such as transportation, partner exploration, and contact.

The trade treatment variable is a dummy variable. I have assumed that the trade relations between two countries will develop if they provide to their partner a preferential treatment on trade, e.g., a bilateral trade agreement, GSP regime, or FTA. The information on GSP and FTAs are taken from the website of each country or organization including Japan, the United States, the EU, and the WTO.

The study includes the dummy variable of APEC because the Asia-Pacific area is one of dynamic development; if both countries lie in a dynamic zone such as the Asia-Pacific, they should increase their trade relations. The study also takes into consideration the role of the APEC, particularly in the context that APEC is trying to reform to make East Asia more effectively organized. Therefore, the APEC variable may affect trade, at least because with this forum, countries can have more chances of dialogue to solve bilateral issues. The data on APEC membership is taken from the APEC website.

The information on the main languages used in each country is taken from the CIA fact-book (2005). If both countries use the same language, they can reduce the transaction cost and more easily understand each other, thus improving trade relations. In Vietnam, English is increasingly favored as a second language, so this study assumes that English can be used as a business language in Vietnam.

All other independent variables are dummies, which take the value of 1 if they satisfy the specified conditions and are otherwise 0.

I ran analyses at two-year intervals from 1997 to 2003 for the Vietnam and the 13 nations specified in Table 5. This created a country setting of 91 country pairs (14 x 13/2) for 1997, 1999, 2001, and 2003 with a total of 364 observations. The countries chosen in my test vary from developing countries to developed ones in five continents, and have all received much attention from Vietnam in its trade relations.

Empirical Results

In its own way of self-development, Vietnam is always afraid of being a late-comer, so the Vietnamese government takes many active steps towards international integration. In a new attempt, Vietnam is trying to carry out its trade development with FTAs because many countries in the region and in the world have been involved in FTA negotiation or have arranged FTAs with favorable partners.

Japan with its advantage of having the second largest economy in the world, but also facing many problems of an aging society and a sluggish economy, is attempting to maintain its power and expand its influence in both the region and the world in the face of serious political and economic competition with China. To succeed in its attempt, Japan has developed FTAs with many countries in the Asia-Pacific region such as Thailand, the Philippines, Korea, Mexico, Chile, and Australia.

The question here is whether an FTA between Vietnam and Japan is a good solution for both countries. In the first look at this question with my first equation, the result in Table 1 (see Appendix) is consistent with the theory that bilateral trade volume should have a positive relationship with the size of the economy and the average income of residents while being negatively related to the distance between two countries. Moreover, as predicted, trade treatment holds an important role in trade development, namely, if the two nations enjoy an FTA or provide their partners a GSP, the trade volume will increase by 0.62% (0.31 x 2) at the significant level of 99%. Beside this, the Asia-Pacific area proves its advantage as a favorable environment for trade: the dummy variable of APEC shows the coefficient of 0.87 at the significant level of nearly 100%. The adjusted R-squared reaches nearly 92%, so this model may well reflect the trade flows of the pairs.

Applying the second equation indicates that Japan has recently tended to be trade-deficient while Vietnam has a tendency toward being trade-intensive. The Japan dummy variable obtained a negative coefficient of –1.379 at the significant level of 99% while the Vietnam dummy variable showed a positive coefficient of 0.807 at the significant level of 99% (Table 2).

The coefficient for Vietnam means that Vietnam's trade with its partners is estimated to be 125%[1] higher than what trade would be between two otherwise-similar countries with the same economic size, distances, and so on. Based on the limited data of the 14 nations investigated, it is highly likely that Vietnam holds a greater potential for trade than Australia, Korea, India, and Mexico, all of which are included in the priority

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[1] This is calculated by taking the antilog of the coefficient estimate and then subtracting 1, as the dependent variable is in log form (Choi 2001).

list of potential FTA partners for Japan (Ministry of Foreign Affairs of Japan 2001). Meanwhile, Japan's trade with its partners is estimated to be 75% less than what trade would be between otherwise-similar countries with the same economic size, distance, and so on; Choi (2001) estimated that the Japan dummy variable's coefficient was only 0.07 based on the statistical data of 1997. The result of Japan may come from the FDI's substitution effect for trade as be explained in the methodology.

To investigate the capacity for trade integration between Vietnam and Japan, the second equation should be taken into account.

The results show that the Vietnam-Japan dummy variable has a negative coefficient of –0.29, which, though not statistically significant (P-value for this is 0.55, meaning that the significant level about 50%) may still indicate that Vietnam and Japan are not currently integrated in trade; this bloc will trade 25% less than any otherwise-similar countries. Table 2 also shows that the blocs of Japan-Korea, Japan-Mexico and Japan-Singapore also hold negative coefficients, despite that these countries are on Japan's priority list of FTA partners, and that Singapore has concluded an FTA and Mexico has signed one with Japan. This agrees well with the result found by Choi (2001) on the blocs of Japan-Korea and Japan-Mexico based on the 1997 data.

In analysis of the two countries' openness toward other trading partners, meaning the bilateral trade between two chosen nations in relation to world trade, the third equation showed that the level of trade integration between Vietnam and Japan strengthened to the significant level 80% for the Vietnam-Japan openness bloc, compared to 60% for the Vietnam-Japan bloc (Table 3).

The results show that the Vietnam-Japan bloc is estimated to trade 40% more than other trading blocs similar in terms of economic size and distance. Moreover, in open trade, the trade between Japan and Vietnam is 16% more than that of otherwise-similar country pairs. The bloc of Japan and Singapore has the coefficient of 0.6 without openness and 0.7 with it. This means that Japan and Singapore may be good partners for one another as their trade is estimated to be 82.2% higher than other similar country pairs, thus making contribution to explain why Japan and Singapore concluded an FTA in 2002.

According to this preliminary study, Japan and Vietnam could become FTA partners due to the advantage of their bloc.

To further explore the capacity of Japan and Vietnam toward an FTA, I will next focus on the trade flows of Vietnam.

The R-squared in the result reaches 89%, so this model can be used to explain the trade flow of Vietnam. The trade relation between Vietnam and its partners depends heavily on the size of the economy, distance between the countries, and other factors including trade treatment and language (Table 4). Furthermore, the above result indicates that the trade flow of Vietnam depends much more on trade treatment than do other countries, with the estimated coefficient of 0.35, implying that if Vietnam and Japan concluded an FTA, their trade volume would increase by 0.7% (the coefficient for trade treatment is 0.35 and the dummy for FTA is 2), while this figure on the world trade flow is only 0.62% (the coefficient of trade treatment for world trade is only 0.31, further detail in Table 1).

Moreover, if the trade partners of Vietnam are APEC members, their trade volume may also increase by 0.58% (the coefficient estimate of the APEC dummy variable is 0.58 at the significant level of 98%).

Using the estimated trade flow of Vietnam, we can estimate the trade potential for Vietnam. The absolute difference between the potential (P) and the actual level of trade (A), that is, A-P will be used to analyze the future direction of trade for Vietnam. If the value of A-P is negative, the trade volume between Vietnam and its partner may not match its potential or their actual trade does not exceed their trade potential, meaning that their trade volume has more potential to develop in the future.

Table 6 demonstrates that the actual trade between Vietnam and Japan from 1997 to 2003 was less than expected, meaning that Vietnam and Japan may not have reached their potential. Therefore, the possibility for future trade expansion between Vietnam and Japan is quite large.

Policy Implications

The above analysis indicates that Japan and Vietnam may have room for trade improvement. To this end, a free trade agreement between them is strongly suggested as an appropriate step; despite that Japan granted a GSP for Vietnam and that the two nations have signed many agreements to facilitate trade and investment. Actually, the GSP regime that Japan granted for Vietnam still contains many trade restrictions such as that the 0% tariff line on Vietnamese agricultural and aquatic products must account for only 37% of the total tariff line, in which only 226 agricultural and aquatic products enjoy GSP (Ministry of Trade of Vietnam 2004).

According to the criterion set by the Japanese government in its FTA strategy in 2001, attainment of the economic interest of Japan, Vietnam has a high likelihood of becoming a potential FTA partner for Japan due to the possibility of trade expansion that would come from an FTA.

On the side of Vietnam, FTAs with appropriate partners would help to develop its trade volume because as estimated, Vietnam depends much on trade treatment. Furthermore, the member nations of APEC and other large economies should rank high in the priority list of its potential FTA partners. Among the 13 nations examined, Japan, Singapore, India, and Egypt are recommended as potential partners for Vietnam's FTA strategy. The trade relations with the United States, after falling below potential from 1997 to 2001, have exceeded potential since 2003. This may be a result of the Bilateral Trade Agreement (BTA) between Vietnam and the U.S. signed in 2001, so an FTA between the two nations at this moment seems to be unnecessary. Additionally, it is surprising that the trade between Vietnam and the EU has always exceeded the potential even though the total trade between the two is quite modest. This may come from the complicated structure of the EU, a unified organization treated in this study as a country; more study on this case is needed before an FTA can be considered.

Conclusion

Vietnam, with its small and transitional economy, has developed from its backward, war-devastated past. In its development, the Vietnamese government has learned from the valuable experience of many Asian countries including Japan, Korea, Singapore, and Taiwan, the major exporters and producers in the world economy who developed from small economies, that an appropriate trade policy will play an important role in the development of the national economy. Vietnam has therefore taken many active steps toward trade liberalization. In this effort, building and pursuing trade policy on the basis of scientific knowledge, particularly quantitative methods, is crucial.

This study applied the gravity model in analyzing and predicting which countries can become appropriate partners in FTAs with Vietnam. Against the complicated background of the real world, this method in this study, like other research, only explains a portion of trade flows, covering some factors of trade while neglecting other ones. The results may therefore be subject to missing data or wrong function form. However, at the significant level of around 85%, and in terms of the gravity model, this study can assert that the feasibility of a Vietnam-Japan free trade agreement is quite high because such an agreement could further expand the trade relations between Vietnam and Japan.

With the high value of R-squared in all of the model estimations, particularly the value of R-squared in the model applied for Vietnam's trade flows, I believe that the gravity model can explain some part of the trade flows of the world in general and those of Vietnam in particular. The gravity model can thus be used as one approach to explore the potential of other countries as partners of Vietnam in its FTA negotiation.

In the real world, two nations can reach a free trade agreement not only because of trade development but also some other factors including investment development, strengthened relations, and their political calculations and will. Particularly, with the complicated production and transaction process we have today, many countries like Japan and Korea, instead of exporting to one country, have set up FDI firms to produce commodities and sell them in the local market (Nikkei Weekly Newspaper 2005) meanwhile some products are produced in multiple countries, in which each country produces one or more parts of the product (Ohno 2005), thus just looking at the simple trade of export and import may oversimplify international transactions. This study, through many analyses under gravity model, just focused on determining the feasibility of an FTA between Vietnam and Japan based on the future possibility of trade expansion stemming from their hypothetical FTA. However, with the current Japan-China tension, the positive relations between Vietnam and Japan, the problems faced by Japan's aging society, and Vietnam's need to develop its economy by further penetrating Japan's market, I believe that an FTA between Vietnam and Japan would be an active step towards mutual benefit and development.

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Appendix

Table 1: Trade intensities of 14 observed nations (gravity model estimation)

Dependent Variable: LOG(TRADE)
Method: Least Squares
Date: 06/08/05   Time: 17:44
Sample: 2,365
Included observations: 364

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-31.57150	4.500424	-7.015228	0.0000
LOG(GDP)	1.051181	0.072303	14.53857	0.0000
LOG(GDPCAP)	0.145586	0.057947	2.512405	0.0124
LOG(DISTANCE)	-0.716120	0.080694	-8.874476	0.0000
APEC	0.871301	0.113165	7.699372	0.0000
Trade treatment	0.314401	0.086256	3.644985	0.0003
Language	0.289010	0.142815	2.023670	0.0438
Japan	**-1.379813**	**0.342158**	**-4.032677**	**0.0001**
U.S.	-1.367975	0.422638	-3.236749	0.0013
E.U.	-0.719129	0.431794	-1.665446	0.0967
Vietnam	**0.807856**	**0.229329**	**3.522698**	**0.0005**
Korea	0.229065	0.193042	1.186609	0.2362
Australia	0.040276	0.208394	0.193269	0.8469
India	-0.169049	0.140371	-1.204302	0.2293
Singapore	1.195640	0.165292	7.233508	0.0000
Mexico	-1.649212	0.156383	-10.54597	0.0000
R-squared	0.911099	Mean dependent var		21.70496
Adjusted R-squared	0.907267	S.D. dependent var		2.318396
S.E. of regression	0.706000	Akaike info criterion		2.184559
Sum squared resid	173.4560	Schwarz criterion		2.355862
Log likelihood	-381.5897	F-statistic		237.7639
Durbin-Watson stat	1.159316	Prob(F-statistic)		0.000000

Note: Country variable takes value of 1 if the pair of nations includes a particular country and 0 if it does not.

Source: Author's calculation

Table 2: Trade integration among selected countries (gravity model estimation)

Dependent Variable: LOG(TRADE)
Method: Least Squares
Date: 06/09/05   Time: 21:27
Sample: 2,365
Included observations: 364

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.108019	1.331412	-6.089790	0.0000
LOG(GDP)	0.702659	0.024978	28.13096	0.0000
LOG(GDPCAP)	0.305688	0.028422	10.75548	0.0000
LOG(DISTANCE)	-1.534493	0.087939	-17.44945	0.0000
Japan-Korea	-2.731168	0.531008	-5.143367	0.0000
Japan-Mexico	-1.058051	0.495245	-2.136420	0.0333
Japan-Singapore	-0.077309	0.502529	-0.153839	0.8778
Japan-Vietnam	**-0.296192**	**0.495153**	**-0.598183**	**0.5501**

R-squared	0.826018	Mean dependent var	21.70496
Adjusted R-squared	0.822597	S.D. dependent var	2.318396
S.E. of regression	0.976491	Akaike info criterion	2.812030
Sum squared resid	339.4581	Schwarz criterion	2.897681
Log likelihood	-503.7894	F-statistic	241.4554
Durbin-Watson stat	0.668973	Prob(F-statistic)	0.000000

Note: Dummy bloc variables take the value of 1 if both countries in the pair are in the bloc, and 0 if they are not.

Source: Author's calculation

Table 3: Openness bloc for trade (gravity model estimation)

Dependent Variable: LOG(TRADE)
Method: Least Squares
Date: 06/08/05   Time: 19:03
Sample: 2,365
Included observations: 364

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.75501	1.254646	-10.96326	0.0000
LOG(GDP)	0.782081	0.022686	34.47485	0.0000
LOG(GDPCAP)	0.241640	0.030013	8.051314	0.0000
LOG(DISTANCE)	-1.226037	0.084678	-14.47886	0.0000
Japan-Korea	-1.746710	0.462896	-3.773444	0.0002
Japan-Mexico	-0.826580	0.435790	-1.896740	0.0587
Japan-Singapore	0.620596	0.438893	1.414001	0.1582
Japan-Vietnam	**0.342111**	**0.436501**	**0.783757**	**0.4337**
Japan-Korea openness	0.021390	0.123747	0.172854	0.8629
Japan-Mexico openness	-1.426876	0.124891	-11.42495	0.0000
Japan-Singapore openness	0.701832	0.136978	5.123686	0.0000
Japan-Vietnam openness	**0.150547**	**0.124992**	**1.204454**	**0.2292**
R-squared	0.875632	Mean dependent var		21.70496
Adjusted R-squared	0.871745	S.D. dependent var		2.318396
S.E. of regression	0.830280	Akaike info criterion		2.498303
Sum squared resid	242.6562	Schwarz criterion		2.626781
Log likelihood	-442.6911	F-statistic		225.3003
Durbin-Watson stat	0.906977	Prob(F-statistic)		0.000000

Note: Bloc openness variables take the value of one if the pair includes a country in the bloc and 0 if it does not.

Source: Author's calculation

Table 4: Trade flow of Vietnam (gravity model estimation)

Dependent Variable: LOG(TRADE_VNJ)
Method: Least Squares
Date: 06/09/05   Time: 21:45
Sample: 2,53
Included observations: 52

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-8.010808	3.278900	-2.443139	0.0185
LOG(GDP_VNj)	0.692429	0.069280	9.994609	0.0000
LOG(GDPCAP_VNj)	0.485467	0.086718	5.598230	0.0000
LOG(DISTANCE)	-1.900550	0.195294	-9.731724	0.0000
APEC	0.586721	0.238761	2.457351	0.0179
Trade Treatment	0.352728	0.164465	2.144695	0.0374
Language	0.410698	0.260454	1.576855	0.1218

R-squared	0.893884	Mean dependent var		20.01146
Adjusted R-squared	0.879735	S.D. dependent var		2.058369
S.E. of regression	0.713827	Akaike info criterion		2.288298
Sum squared resid	22.92972	Schwarz criterion		2.550965
Log likelihood	-52.49575	F-statistic		63.17720
Durbin-Watson stat	0.955896	Prob(F-statistic)		0.000000

Source: Author's calculation

Table 5: Vietnam and its trade partners

	Partners		Year	Actual	Potential	(A-P)		Partners		Year	Actual	Potential	(A-P)
1	EU	Vietnam	1997	22.1121	21.6712	0.44081		China	Vietnam	2001	21.76	21.5609	0.19907
			1999	22.2251	21.7834	0.44176				2003	22.258	21.8715	0.38644
			2001	22.4425	21.7878	0.65467	8	Australia	Vietnam	1997	20.2124	19.4828	0.72963
			2003	22.7125	22.2522	0.46028				1999	20.7909	20.0897	0.70118
2	US	Vietnam	1997	20.3522	20.3443	0.00788				2001	21.0159	20.128	0.88794
			1999	20.672	21.1134	-0.4414				2003	21.2361	20.3105	0.92554
			2001	21.1933	21.6199	-0.4265	9	Egypt	Vietnam	1997	15.7756	16.6623	-0.8866
			2003	22.5526	21.8142	0.73846				1999	15.4448	17.2594	-1.8146
3	Japan	Vietnam	**1997**	**21.9645**	**22.6969**	**-0.7323**				2001	16.0127	17.3999	-1.3871
			1999	**22.007**	**23.3885**	**-1.3815**				2003	17.2495	17.3235	-0.0739
			2001	**22.2003**	**23.5501**	**-1.3498**	10	India	Vietnam	1997	18.6597	19.366	-0.7063
			2003	**22.4655**	**23.4657**	**-1.0001**				1999	18.8969	19.4955	-0.5985
4	Korea	Vietnam	1997	21.3276	20.9113	0.41623				2001	19.3762	19.6351	-0.2588
			1999	21.2598	21.357	-0.0972				2003	19.9	19.835	0.06501
			2001	21.4747	21.6079	-0.1332	11	Mexico	Vietnam	1997	16.951	16.6911	0.25991
			2003	21.8449	21.8077	0.03724				1999	17.0736	17.5419	-0.4683
5	Singapore	Vietnam	1997	21.5163	20.9585	0.55772				2001	17.6442	17.9015	-0.2573
			1999	21.4313	21.7719	-0.3405				2003	18.1462	18.0813	0.06499
			2001	21.8085	21.9831	-0.1746	12	New Zealand	Vietnam	1997	17.9099	18.0078	-0.0979
			2003	21.9558	22.0353	-0.0795				1999	18.1975	18.4631	-0.2656
6	Indonesia	Vietnam	1997	20.0499	19.0816	0.96834				2001	19.0625	18.452	0.61055
			1999	20.6614	19.5578	1.10357				2003	18.683	18.7257	-0.0426
			2001	20.0099	19.7257	0.28423	13	South Africa	Vietnam	1997	16.7059	17.0997	-0.3938
			2003	20.6067	20.0692	0.53749				1999	17.5997	17.0113	0.58838
7	China	Vietnam	1997	21.0879	19.9074	1.18051				2001	17.3709	17.3024	0.06844
			1999	21.0009	21.0189	-0.0179				2003	17.7275	17.6169	0.11066

Source: Author's calculation