**AN EXAMINING FACTORS INFLUENCING INTERNATIONAL EXPORT AND IMPORT RELATIONSHIPS IN CONTEXT OF VIETNAM’S FREE TRADE AGREEMENTS**

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**ABSTRACT:** The paper uses a gravity model to analyze the factors include GDP, population, the distance between Vietnam and other countries in the region, the exchange rate, national borders and Free Trade Agreements which affect to the two-way trade between Vietnam and other countries in the Comprehensive Economic Partnership for East Asia by combining regression methods for panel data as Pooled OLS, Random Effect Model, Fixed Effect Model and Hausman Taylor. According to the results, the study shows that factors such gross domestic product, population, and exchange rates are the significant influent in trading relationship between Vietnam and other partner countries in the region, however, the signing of Free Trade Agreements is not as effective as expected. The authors partly explain the model and help find out the important factors affecting the context of Vietnam's trade in the region.

**Keywords:** Free trade agreement, trade, import, export.

**JEL:** F10, F13, F14, F17

**INTRODUCTION**

International trade of goods is one of the significant economic activities contributing to the development of the country that influenced by many domestic and international factors, including the degree of openness and integration of each country. According to the increasing the trend of globalization, Vietnam is constantly seeking and establishing strategic economic partnerships with countries in the region as well as in the world through trade liberalization agreements. The regional framework is known as the Comprehensive Economic Partnership for East Asia, which consists of the 10 members of the Association of Southeast Asian Nations (Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand, Vietnam) plus Australia, China, India, Japan, New Zealand, and South Korea. In 2013, the countries of the Comprehensive Economic Partnership for East Asia got a peak when accounting for 31.2 percent of total GDP, 31.6 percent of total global trade and 48 percent of the world population. Vietnam's trade with other countries in the region accounts for a very large share, 74.5% of Vietnam's total trade value in 2013 according to World Trade Statistic 2013. In 2017, prospective member states accounted for a population of 3.4 billion people with a total Gross Domestic Product (GDP, PPP) of $49.5 trillion, approximately 39 percent of the world's GDP according to World Trade Statistic 2017. And so far, the trade relations between Vietnam and the Comprehensive Economic Partnership for East Asia continue to have positive impacts.

One of the research methods has been applied by many economists to analyze two-way trade between countries is the gravity model. The trade model between Vietnam and the Comprehensive Economic Partnership for East Asia is tested by this model.

The gravity model is based on the principle of Newton's law of gravitation. The gravitational force exists between the two objects followed by their masses as the formula: $F\_{ij}=G.\frac{M\_{i}M\_{j}}{D\_{ij}^{2}}$

*Where* $F\_{ij}$*is the gravitational force between two objects,* $D\_{ij}$ *is the distance,* $M\_{i}$***,*** $M\_{j}$*is the mass of two objects, and* ***G*** *is the gravitational constant.*

The theory of gravity was first applied in international trade by Jan Tinbergen in 1962 and then many economists applied this theory to analyze the flow of bilateral trade between countries. According to Krugman et al. (2012), the common gravitational model is used as follows: $T\_{ij}=A.\frac{Y\_{i}Y\_{j}}{D\_{ij}}$

*Where* ***A*** *is constant,* $T\_{ij} $*is the total trade flow from country i to country j,* $Y\_{i} and Y\_{j}$ *Represent the size of the economy of nation i and nation j (are usually gross national income (GNP) or gross domestic product (GDP), and* $D\_{ij}$ *is the distance between country i and country j.*

 The basic gravity model is expressed as logarithms as follows: $ LnT\_{ij} = α+β\_{1}.LnY\_{ij}+β\_{2}.LnD\_{ij}+\sum\_{k=1}^{k}γ\_{k}z\_{ijkt}+ε$

*Where* $T\_{ij}$ *is trade flow,* $Y\_{ij}$ *is GDP of country i and j,* $D\_{ij}$ *is the distance between country i and country j,* $z\_{k} $*is dummy showing the two countries of the same language, border, continent, are colonies of each other, signed FTA, and is invalid number.*

The Linneman (1963), Bergstrand (1985), Eaton and Kortum (1997) and Deardorff (1998) approached and demonstrated that the weight model derives from H-O theory in the absence of factors affecting the trade.The gravity model is widely used in commercial analysis and contains many explanatory variables but the most commons as follow:

*First*, the dependent variable is related to trade. This variable can be a total trade, export or import turnover.

*Second*, the size of the economy can be measured by gross national income (GNP) or capita income (CI).

*Third*, the variable of the distance is the frequently considered in the model, which represents the cost of a trading activity. Theoretically, the larger the distance between countries is, the less attractive the trade is. The distance is measured on a straight line from the national capital i to the national capital j. However, such measurements have not yet brought about uniformity and accuracy.

*Finally*, the gravity model adds a number of explanatory variables such as exchange rates, dummy variables such as Free Trade Agreement, border, language, colonial relationship, strategic partner and so on to quantify and consider the impact on two-way trade between countries.

**RESEARCH METHOD**

**Econometric Models**

In conjunction with the weight model developed by Schnatz, & Bussiere (2006) as well as other scholars, the writer constructed a weight model for the analysis of trade relations between Vietnam and the other countries in the Comprehensive Economic Partnership for East Asia as follows:

*Export patterns (1)* $LnTex\_{ijt} = α+β\_{1}.LnY\_{ijt}+β\_{2}.LnP\_{ijt}+β\_{3}.LnD\_{ij}+β\_{4}.LnEx\_{it}+β\_{5}LnEx\_{jt}.+β\_{6}.border+β\_{7}FTA+ε$

*Import patterns (2)* $LnTex\_{ijt} = α+β\_{1}.LnY\_{ijt}+β\_{2}.LnP\_{ijt}+β\_{3}.LnD\_{ij}+β\_{4}.LnEx\_{it}+β\_{5}LnEx\_{jt}.+β\_{6}.border+β\_{7}FTA+ε$

Where:

$T\_{ij}$*: Two-way trade of Vietnam (i) and partner country (j) at time (t);* $Tex\_{ij}$*: Export turnover of Vietnam (i) and partner country (j) at time (t);* $Tim\_{ij}$*: Import turnover of Vietnam (i) and partner country (j) at time (t);* $Y\_{ijt}$*: Total GDP of Vietnam (i) and partner country (j) at time (t);* $P\_{ijt}$*: The total population of Vietnam (i) and partner country (j) at time (t);* $D\_{ij}$*: The distance between the capital city of Vietnam (i) and the capital of the partner country (j;* $Ex\_{it}$ *and* $Ex\_{jt}$*: The average annual exchange rate at time (t) for Vietnam dong (i) and the partner country currency (j) against the US dollar; Border: The counterfeit, the countries bordering Vietnam: Laos, Cambodia, China,* $border$ *equals to 1, the remaining countries are equal to 0; and* $ FTA$*: Dummy, FTA = 0 if FTA is not signed between Vietnam and that country, 1 means FTA signed.*

Of all the explanatory variables, the total GDP variable represents the magnitude of the two economies on both the domestic production capacity and the magnitude of the market in that country. According to the gravity model, the coefficient "β" \_ "1" is expected to be positive. If a country has strong domestic production capacity, it means that the country tends to import more raw materials and produce products for export based on certain competitive advantages. As GDP grows, it will be the driving force for developing two-way trade between nations.

Population refers to the magnitude of production and consumption in a country. If the population is large, the labor force is relatively abundant, the ability to produce more products and the ability to consume products also increased due to the demand of people in the country increased. Basically, the population will affect the total trade, however, depending on the policies of each country on the structure of employment, the specialization of products, and the ability to produce to meet the demand in the country.

The geographic distance between the two countries affects trade, which determines the cost of transport, the time it takes to transport goods (Krugman and Obstfeld, 2009), cultural differences (such as demand). Products in daily life) and market penetration, the coefficient "β" \_ "3" according to the model theory will be negative.

Dell 'Arricia (1999) introduced more exchange rates into the research model and influenced the interpretation of bilateral trade flows. Theoretically, the exchange rate affects the output and input flows. Therefore, the authors choose to add exchange rate variables in order to check the extent of its impact on trade between Vietnam and the Comprehensive Economic Partnership for East Asia in any direction.

In previous studies, Frankel (1997) calculated the effects of trade integration on two-way trade flows. Frankel introduced the dummy variable to determine the level of intraregional trade in the affiliate countries by allowing imports of the dummy variable EU, NAFTA, APEC, Mercosur into a weight model for interactions between trade and FTAs. Therefore, in order to assess the process of signing FTAs ​​between Vietnam and ASEAN and other countries expanding to affect the trade of Vietnam in any direction, the authors introduced the model of adding FTA dummy variables. In addition, the border is another factor considered between Vietnam and the three neighboring countries for bilateral trade. The coefficients "β" \_ "6" and "β" \_ "7" are expected to be positive, because the fact that the countries are close to each other, the trade exchange is relatively favorable, thereby promoting trade flow. Furthermore, the signing of Trade Liberalization Agreements will have a positive impact on import and export activities, as trade barriers and non-trade barriers are pledged.

**Data**

Data were collected including the 16 countries of Comprehensive Economic Partnership for East Asia. Observations of the model are relatively large with over 5000 in the period of 24 years, which fully reflects the trade situation in Vietnam and its partner countries and the fluctuations in the formulation of trade liberalization agreements. The data is presented in panel form for model regression.

Data on two-way trade is taken from the International Monetary Fund (IMF) in dollars. Also, the exchange rate of each country is taken from the International Monetary Fund (IMF), which is the average annual exchange rate of the national currency against the US dollar. And GDP, the population is taken from the World Bank (Data World Bank). Finally, the distance between the two countries is calculated from the distance from the capital city of Hanoi to the rest of Comprehensive Economic Partnership for East Asia which the unit of calculation is km.

FTA is a dummy variable lead to a zero value when Vietnam has not yet signed FTAs ​​with its partner countries, which is equal to 1 when the Free Trade Agreement is signed.

**Analytical Techniques**

There are three forms of the primary models to estimate the panel data are the pooled ordinary least squares (pooled OLS), the random effect model (REM) and fixed effect model (FEM).

For the Pooled OLS method does not have the element of the time and the space in the panel data table. In another word, this method sees the country and time as same; thus, it does not preserve the accuracy of the model. Because the trade relations between Vietnam and other countries are different, the factors in the model will vary for each country and change over time, most notably Free Trade Agreement s.

The methods mention to the element of the time and the space in the panel data are the random effect model and fixed effect model. To select one of these models, the most popular approach is using the Hausman test (Hausman, 1981). The Hausman test is used in order to select the suitable estimated method between FEM and REM. The Ho hypothesis is that there is no correlation between the characteristic error of the objects and the explanatory variables in the weight model. The REM estimate is reasonable under the Ho hypothesis but not in the alternative hypothesis. Estimation of FEM is reasonable for both the null hypothesis and alternative hypothesis. However, in the case that the Ho hypothesis is rejected, the fixed-effect estimate is more appropriate than the random effects estimate. In contrast, the fixed-effects estimation is no longer consistent and random estimation will be preferred.

The problem is that in the model not only are there variables that change over time but also contain fixed variables over time such as distance and boundary. Thus, these variables will be eliminated out of the regression model when using FEM. In contrast, REM can solve this problem but it ignores the unobservable correlations between explanatory variables and errors (Kien, 2009). Therefore, the model will be best solved if the advantages of REM as well as the correlation between the explanatory variables and the errors are corrected. Hausman and Taylor's approach is suggested as a way to solve the problem (Hausman and Taylor, 1981). Hausman and Taylor (HT) regression methods are required to indicate endogenous variables and exogenous variables. The authors assume that increasing or decreasing international trade will affect the GDP growth of Vietnam and its partner countries, as well as the impact on the exchange rate of the country. If so, the two variables GDP and the exchange rate will be endogenous variables. In addition, it may be recognized that the rise and fall of international trade will clearly not affect the national population, national borders and the distances of the two countries, thus, distance and population are clearly exogenous. The problem is that Free Trade Agreements are considered endogenous or exogenous variables. It is likely that the increase in trade will lead to the conclusion of an Free Trade Agreement. It may also be that countries need Free Trade Agreements to increase trade or assume that free trade agreements are the trend of international economic integration. For simplicity, the authors argue that Free Trade Agreement is an exogenous variable. The variables that do not change over time in the model include distance and gender, the remaining variables change over time. Adjustment of endogenous and exogenous variables in the model has overcome FEM and REM errors, which is the optimal method for estimating the weight model in the study of the authors.

**EMPIRICAL AND DISCUSSION**

**Examining in Export model *(1)* and Import model *(2)***

***Export model (1)***

**Table 1: Pooled OLS, FEM, REM, HT regression results of the exported model**

|  |
| --- |
| **Dependent variable: Total export turnover**  |
| **Independent variables** | **Pooled OLS** | **FEM** | **REM** | **HT** |
| **GDP** | 1,5594(17,72)\* | 0,4608(2,68)\* | 1,1827 (8,14)\* | 0,5503 (3,27)\* |
| **Population** | -0,8874 (-7,38)\* | 12,4842(6,66)\* | -0,1429(-0,38) | 10,5144 (6,11)\* |
| **Distance** | -0,5139 (-3,18)\* | ---- | -0.3526(-0,72) | -0,4571 (-0,10) |
| **Exchange Rate of partner countries** | 0,0221 (0,70) | -0,0435(-0,46) | 0,0570(0,74) | -0,0367 (-0,39) |
| **Exchange Rate of Vietnam** | 1,2615 (2,77)\* | 0,6518(1,30) | 2,6980(7,08)\* | 1,0247 (2,14)\*\* |
| **FTA** | 0,8892 (3,69)\* | 0,1747(1,07) | 0,3619(2,09)\*\* | 0,2106 (1,30) |
| **Border**  | 1,0771 (4,40)\* | ---- | 0,8789(0,99) | -3,2062 (-0,38) |
| **constant**  | -13,9783 (-3,51)\* | -235.5788 (-7,90)\* | -33,1070(-4,91)\* | -199,9498 (-4,44)\* |
| **R-square** | 0,6617 | 0,0593 | 0,6127 |  |

(\*)Significant at 1%; (\*\*) Significant at 5%; (\*\*\*); Significant at 10%

The results of Hausman test with Ho: There is no difference between non-systematic regression coefficients chi2(5) = (b-B)'[(V\_b-V\_B)^(-1)](b-B) = 66,42; Prob>chi2 = 0,0000. Thus, it leads to choosing FEM and HT models.

***Import model (2)***

**Table 2: Pooled OLS, FEM, REM, HT regression results of the imported model**

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| --- |
| **Dependent variable: Total import turnover** |
| **Independent variables** | **Pooled OLS** | **FEM** | **REM** | **HT** |
| **GDP** | 1,4032 (16,35)\* | 0,8819 (5,55)\* | 1,2253 (9,17)\* | 0,9795 (6,49)\* |
| **Population** | -0,6013 (-5,15)\* | 6,2112 (3,59)\* | -0,0017 (-0,00) | 4,0662 (2,95)\* |
| **Distance** | -0,6437 (0,1576)\* | ---- | -0,7480 (-1,33) | -0,6564 (-0,27) |
| **Exchange Rate of partner countries** | 0,0010 (0,03) | -0,2768 (-3,16)\* |  -0,1454 (-1,92)\*\*\* | -0,2678 (-3,07)\* |
| **Exchange Rate of Vietnam** | 2,4318(5,50)\* | 2,3541 (5,11)\* | 3,3276 (9,68)\* |  2,7578 (6,66)\* |
| **FTA** | 0,3153 (1,34) |  -0,0231 (-0,15) | 0,0614 (0,40) | 0,0172 (0,12) |
| **Border** | 0,1690 (0,71) | ---- | 0,4458 (0,43) | -0,7274 (-0,17) |
| **constant** | -24,5682 (-6,35)\* | -142,8316 (-5,19)\* | -38,5603 (-5,08)\* | -103,5746 (-3,61)\* |
| **R-square** | 0,6699 | 0,1610 | 0,6127 |  |

(\*)Significant at 1%; (\*\*) Significant at 5%; (\*\*\*); Significant at 10%

The results of Hausman test with Ho: There is no difference between non-systematic regression coefficients chi2(5) = (b-B)'[(V\_b-V\_B)^(-1)](b-B) = 20.46; Prob>chi2 = 0.0010. Thus, it leads to choosing FEM and HT for import model.

Regression results show that similar to the total trade model, GDP, population, the exchange rate of Vietnam dong against the US dollar are statistically significant and have an impact on export and import activities. Every 1% of GDP increased, exports increased by 0.55% and imports increased 0.98% while total trade increased 0.87%. Economic growth has a strong impact on Vietnam's imports in the region rather than exports, which may be due to the lag between export and import. If the economy grows, it will immediately lead to the demand for imported raw materials, machinery or inputs for production. Meanwhile, export capacity can only be improved after economic growth takes place in a certain time. In other words, the impact of economic growth on exports has a time lag greater than the impact on imports. Moreover, this is in line with the real situation of trade in goods between Vietnam and the Comprehensive Economic Partnership for East Asia in the study period.

Population change affects both exports and imports and has a positive effect, similar to the overall trade pattern, but the impact of population on exports is stronger than imports. This is explained by the fact that the increase in population leads to increased domestic production, leading to trade surpluses and exports to other countries. At the same time, the export structure of Vietnam's products is mainly labor-intensive products and imports of materials and machinery from Comprehensive Economic Partnership for East Asia, which is the commercial advantage of Vietnam about labor.

It is worth noting that the import activity is affected by the exchange rate of the partner country against the dollar. This shows that, for partner countries, exchange rate fluctuations affect the export structure of that country. In other words, the country will limit exports to Vietnam (and other countries) when exchange rate fluctuations are not conducive to them.

In general, similar to the total trade model, the import-export model shows that the Free Trade Agreement has no impact on these two activities. However, in order to learn more about the impact of AFTA and trade liberalization agreements between ASEAN and the enlarged countries, the authors abandoned the Free Trade Agreement from the export and import model and added two dummy variables are ASEAN and other agreements. ASEAN is zero for non-ASEAN countries, and zero for AFTA between Vietnam and intra-ASEAN countries has not yet taken effect. ASEAN when AFTA becomes effective between Vietnam and its partner countries. The other value is zero for ASEAN countries and the year in which ASEAN does not have an Free Trade Agreement for extended countries, once the ASEAN agreements with the enlarged countries are in effect.

|  |
| --- |
| **Dependent variable: Total exports and total imports** |
| **Independent variables** | **Export model** | **Import model** |
| **GDP** | 0,4621 (2,65)\* | 0,9880(6,36)\* |
| **Population** | 11,8008 (6,43)\* | 3,9654 (2,76)\* |
| **Distance** | -0,7347 (-0,14) | -0,7166 (-0,29) |
| **Exchange Rate of partner countries** | 0,0179 (0,18) | -0,2747 (-2,97)\* |
| **Exchange Rate of Vietnam** | 0,8227 (1,69)\*\*\* | 2,7707 (6,63)\* |
| **ASEAN** | -0,0075 (-0,04) | 0,0479 (0,25) |
| **Expanded FTA (with non-ASEAN countries)** | 0,4173 ( 2,02)\*\* | -0,0144 (-0,08) |
| **Border** | -4,1531 (-0,45) |  -0,7189 (-0,16) |
| **constant**  | -217,8160 (-4,43)\* | -101,5389 (-3,45)\* |

After regression, the export model shows that signing Free Trade Agreements with ASEAN is not effective, but signing Free Trade Agreements with other countries has a positive impact on Vietnam's export to the market of these countries. Actual data show that after the enlargement of the Free Trade Agreement s with the enlargement countries, the growth rate of exports surpassed that of previous years, including those of India, New Zealand, and Korea.

In contrast, for imports, the entry into ASEAN as well as the enlarged countries is not affected by the Free Trade Agreement. Indeed, the truth is that comprehensive economic partnership for east asia play an important role in the supply side, so the existence of an Free Trade Agreement does not affect imports for domestic production. On the other hand, Vietnam imports mainly from Comprehensive Economic Partnership for East Asia ancillary products, materials that are state-subsidized import tax so the impact of Free Trade Agreement on this item is negligible. In addition, most of the Free Trade Agreements with Comprehensive Economic Partnership for East Asia have openness levels that are not yet comprehensive and the level of domestic protection remains high through taxation of imported consumer products. It can, therefore, be argued that the Free Trade Agreement does not affect Vietnam's imports from Comprehensive Economic Partnership for East Asia during the study period.

**CONCLUSION**

From the results of the above models, some conclusions can be shown as follows: *Firstly*, the growth of trade between Vietnam and Comprehensive Economic Partnership for East Asia is affected by GDP growth as well as population growth. In terms of export and import activities, the impact of economic growth on imports is stronger than exports. *Secondly*, for Comprehensive Economic Partnership for East Asia countries, the gap does not affect trade between Vietnam and other intra-ASEAN countries, and trade between Vietnam and neighboring countries is not as expected of the model. *Thirdly*, the exchange rate of the Vietnamese dong against the US dollar affects export and import activities. *Fourthly*, the AFTA agreement does not affect export and import activities, while the signing of Free Trade Agreements ​​between ASEAN and other enlarged countries has had a positive impact on Vietnam's exports. Imports are not affected by Free Trade Agreements. As a given, the signing of Free Trade Agreements with the Comprehensive Economic Partnership for East Asia did not produce the expected results. Thus, relevant ministries and agencies should be responsible for assisting enterprises in communicating, guiding and assisting enterprises in the production of the current Free Trade Agreement standards. In addition, businesses should seek accurate and complete information about Free Trade Agreements and consult with government agencies in a practical manner to take advantage of the opportunities provided by Free Trade Agreements.

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