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Analysis of Factors Impacting Vietnam's Agricultural Export to the EU Countries

Thi Anh Tuyet Le[1]*, Vinh Long Hoang[2], Thi Anh Linh Pham[3]

[1] *Doctor of Sciences, Ho Chi Minh University of Banking, Ho Chi Minh City, Vietnam*

[2] *Associate Professor, Nguyen Tat Thanh University, Ho Chi Minh City, Vietnam*

[3] *Ho Chi Minh University of Banking, Ho Chi Minh City, Vietnam*

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Abstract:
This research uses a gravity model combined with panel data to analyze the factors influencing Vietnam's agricultural exports to the European Union (EU) countries. Based on the estimated results, the authors propose several policy recommendations for the Vietnamese government and businesses in enhancing Vietnam's agricultural export in particular and promoting export in general. The data included in the study are collected in a tabular form, so the article uses the fixed effects model (FEM), random effects model (REM), and ordinary least squares (OLS) to determine the impact of factors on international trade flows between Vietnam and the EU countries in agricultural export. The estimated results indicate that geographical distance, exchange rates, and economic disparity positively impact Vietnam's agricultural export activities to the EU member countries. Conversely, trade openness hurts Vietnam's agricultural exports. The research also considers the impact of the EU-Vietnam Free Trade Agreement (EVFTA) on Vietnam's agricultural exports to the EU. However, the estimation results show that the EVFTA factor positively affects export activities but lacks statistical significance in the model. Based on the research results of this article, the agency managing Vietnam's agricultural export activities will make more appropriate management policy adjustments. At the same time, the recommendations in the article are also very necessary for Vietnamese farmers in the context of international economic integration. By including the variable implementing the EVFTA into the research model as a dummy variable, the results of this study will provide new perspectives on agricultural export activities in general as well as exporting agricultural products to a specific EU market.

Keywords: gravity models, export of agricultural products, the EU market, Vietnam.

影响越南农产品对欧盟国家出口的因素分析

Corresponding Author: Dr. Thi Anh Tuyet Le, Ho Chi Minh University of Banking, Ho Chi Minh City, Vietnam; email: tuyetlta@hub.edu.vn

摘要：
本研究利用重力模型结合面板数据分析影响越南农产品对欧盟国家出口的因素。根据估算结果，作者为越南政府和企业提出了几项政策建议，以加强越南农产品出口，促进总体出口。研究中包含的数据以表格形式收集，因此本文使用固定效应模型（有限元法）、随机效应模型（快速眼动睡眠）和普通最小二乘法（最小二乘法）来确定因素对之间国际贸易流动的影响越南与欧盟国家农产品出口。估计结果表明，地理距离、汇率和经济差距对越南对欧盟成员国的农产品出口活动产生积极影响。相反，贸易开放损害了越南的农产品出口。该研究还考虑了欧盟-
越南自由贸易协定（EVFTA）对越南向欧盟出口农产品的影响。然而，估计结果显示EVFTA因素对出口活动有积极影响，但在模型中缺乏统计显着性。根据本文的研究结果，管理越南农产品出口活动的机构将做出更适当的管理政策调整。同时，文章中的建议对于越南农民在国际经济一体化的背景下也非常有必要。通过将实施EVFTA的变量作为虚拟变量纳入研究模型，本研究的结果将为总体农业出口活动以及向特定欧盟市场出口农产品提供新的视角。

关键词：重力模型、农产品出口、欧盟市场、越南。

1. Introduction

International trade has been a significant concern in recent years since Vietnam opened up to international integration. Exports are currently considered a crucial driving force for the economic growth of the country. Exports are viewed as a vital source of national income, and an increase in exports leads to a corresponding rise in national income, thus benefiting the lives of citizens and promoting economic growth.

In the Vietnamese market, agricultural products are recognized as a key sector with many advantages and potential for production and export. Despite the growth in agricultural exports, most exported goods still consist of raw products, competing on price in the low-segment market. Notably, Vietnam's agricultural exports predominantly focus on three main groups: coffee, fruits, and peppers. In addition, technical and technological factors remain limited in their application to the production and export of Vietnamese agricultural products, posing challenges for exporting to the EU market.

The EU export market is both a potential and challenging market for Vietnamese agricultural products. Faced with issues in exporting Vietnamese agricultural products to the EU market, numerous studies have been conducted to analyze related export issues both for goods in general and specifically for Vietnamese agricultural exports, with the aim of providing recommendations and solutions to enhance Vietnam's agricultural export. Studies in Vietnamese have focused on the current situation of Vietnam's exports and proposed solutions to stimulate Vietnam's export development. Furthermore, some foreign studies have explored export issues and market access to the EU for organic products, e.g., Barrett et al. (2001) and Torayeh (2013) analyzed the competitiveness of Egypt's agricultural products when exporting to the EU from 1998 to 2010. From these studies, it is evident that the EU is a potential market for exporting goods for many countries worldwide.

Moreover, Vietnam's trade with the EU member countries took a significant leap forward with a strong emphasis on commerce between the two nations through the signing and exchange of the EU-Vietnam Free Trade Agreement (EVFTA). The EVFTA negotiations concluded on December 1, 2015, and the agreement was officially published on February 1, 2016. The EVFTA is divided into two main agreements: the Trade Agreement (EVFTA), effective from August 1, 2020, and the Investment Protection Agreement (EVIPA). Since the agreement took effect, it has contributed to boosting agricultural exports and overall trade between Vietnam and the EU by reducing tariffs on goods and creating favorable conditions for trade.

In summary, studies conducted before the COVID-19 pandemic, especially those concerning the EVFTA coming into effect on August 1, 2020, are expected to have significant impacts on the export of goods to the EU market. Recognizing these issues, the authors investigated the factors influencing the export of Vietnamese agricultural products to the EU countries and assessed the impact of the EVFTA on trade. The aim of this study was to propose recommendations that will help Vietnamese businesses seize opportunities to boost exports to the potential EU market.

2. Theoretical Foundation

The gravity model, also known as the attraction force model, was initially introduced by Tinbergen (1962). The model originates from Isaac Newton's law of universal gravitation, which states that the gravitational force between two objects depends on their distance and mass. Based on this theory, the gravity model is applied in experimental studies to analyze the factors influencing trade activities between two or more countries. Currently, the gravity model is widely applied in research to analyze and evaluate factors affecting trade. The basic representation of the model proposed by Tinbergen (1962) is as follows:

$$EXPORT_{ij} = \varphi \frac{Y_i Y_j}{D_{ij}}$$

Here, *EXPORT* represents the volume of exported goods between countries *i* and *j*, *Y* denotes the economic scale of countries *i* and *j* (measured by the GDP or total national output), *D* is the geographical distance between countries *i* and *j* (representing the transportation and service cost factors), and φ is a constant. Taking the logarithm of both sides of the equation results in the following formula:

$$InEXPORT_{ij} = \varphi + \beta_1 lnGDP_i + \beta_2 lnGDP_j + \beta_3 lnDIS_{ij} + \varepsilon$$

where ln(GDP) represents the economic scale of countries *i* and *j*, ln(DIS) is the geographical distance between the two countries $\beta 1$, $\beta 2$, $\beta 3$ are the regression coefficients of the model and ϵ is the random error term.

Over time, the gravity model has been further developed and refined by researchers to provide more accurate estimation results. Brada and Mendez (1985) introduced the population variable into the model, finding that the larger the importing country's population, the greater the volume of goods and services imported into that country, and vice versa. However, Linnemann (1966) indicated that the population factor had an inverse impact on international trade in goods.

Furthermore, researchers have successively added various variables to the model to determine the effects of these factors on trade activities, such as exchange rates, economic development levels, common languages, shared borders, and cultural distances. With the addition of these initial variables, Linnemann (1966) categorized factors into three main influencing groups: factors affecting supply, representing the economic scale of the exporting country; factors affecting demand, reflecting the economic scale of the importing country; and impediment and attraction factors, indicating the attractiveness or hindrance to trade activities between countries. Over time, numerous studies applying the gravity model to analyze factors influencing export activities have shown that the model adequately reflects the essence of trade activities.

3. Previous Studies

Research on trade factors between Vietnam and countries worldwide has been conducted for many years. Until the gravity model emerged, researchers chose this model to analyze the impacts of various factors on the trade activities of Vietnam and other nations.

Le Uyen et al. (2022) used the gravity model to analyze the impacts on Vietnam's coffee export activities from 2008 to 2020. This study combined static and dynamic methods in regression models, such as fixed effects and random effects models, to identify the key factors affecting Vietnam's coffee export activities. The factors identified in the study included the per capita GDP of Vietnam and the importing country, the geographical distance between the two countries, the exchange rate of the Vietnamese dong (VND) with the importing country's currency, the total population between Vietnam and the importing country, and the Free Trade Agreement (FTA) variable. The results showed that the total population and exchange rate had positive impacts, whereas distance variables and agricultural land area had negative impacts on coffee export activities. The study also indicated that past coffee exports influenced current export activities.

Hương and Thơ (2021) focused on the export of another popular agricultural product, tea. This study used the gravity model to analyze factors affecting the export value employing the Poisson pseudo-maximum likelihood (PPML) estimation method. The results suggested that variables such as shared borders, exchange rates, Vietnam's WTO membership status, importing country's ASEAN membership and importing country's EU membership positively influenced tea export activities. Conversely, negative factors included the importing country's per capita income, geographical distance, and trade agreements between Vietnam and the importing country.

Cui and Dao (2019) analyzed and calculated the level of trade facilitation in Vietnam-ASEAN trade, pointing out that e-commerce, customs environment, infrastructure, and institutional environment were the four factors influencing trade facilitation. Using the gravity model, the study concluded that these factors significantly impacted the research topic, leading to policy recommendations for enhancing trade activities.

Continuing previous research, Diệp et al. (2018) applied the gravity model to analyze factors influencing Vietnam's exports to the EU market. The study revealed that variables such as population, GDP, institutional quality, and WTO accession had positive effects, while variables like geographical distance and technological distance had negative effects on goods exports to the EU. The study provided recommendations to strengthen Vietnam's export activities based on the estimated results.

Before that, Yến and Thảo (2017) used the gravity model along with other effective tools to explain the volume and direction of trade among countries. This study focused on analyzing variables such as Vietnam's rice cultivation area and economic distance factors. The results indicated that total national production of Vietnam, geographical distance, inflation in Vietnam, and rice cultivation area had positive effects on Vietnam's rice export value, whereas economic distance factors had a negative impact. The authors proposed solutions and recommendations based on the estimated results to improve export activities.

Fricke and Chapman (2017) researched the impact of trade standards on agricultural exports from sub-Saharan African countries to the EU market. Using the gravity model and the PPML estimation tool, the study showed that any applied trade standard had a negative impact on agricultural export activities. However, countries' compliance with international standards positively affected exports.

Irshad et al. (2018) focuses on analyzing trade between China and 14 OPEC member countries in

1990-2016. The analytical model is based on China's demand for energy and consumer goods. This study used the gravity model to reveal that China's bilateral trade with OPEC members positively influenced factors such as GDP, per capita income, China's trade openness, and the OPEC membership status of its trading partners. However, it negatively affected geographical distance and exchange rates.

Karamuriro and Karukuza (2015) conducted an analysis to identify key factors influencing exports between Uganda and its trading partners. Using the gravity model, the study found that Uganda's and the importing country's GDP, per capita incomes, exchange rates, shared language, shared borders, and the establishment of the COMESA and EAC had positive effects on exports. However, geographical distance had a negative impact on Uganda's exports.

Ebaidalla and Abdalla (2015) focused on Sudan's agricultural exports, utilizing the gravity model. The study found that variables like distance had a negative impact, while GDP and population scale had positive effects on Sudan's agricultural exports. In addition, infrastructure variables had a positive impact on export efficiency.

These studies collectively showcase the diverse applications of the gravity model in analyzing trade factors, providing valuable insights into the dynamics of trade activities between countries in various regions and sectors.

4. Proposed Research Model

On the basis of the theoretical foundation of the gravity model and insights drawn from previous studies, the proposed research model for this study is as follows:

$$EX_{Vjt} = k \times DIS_{Vj}^{\beta_1} \times ER_{Vj}^{\beta_2} \times OPEN\_TRADE_{jt}^{\beta_3} \times EDIS_{Vj}^{\beta_4} \times e^{EVFTA_{Vj}^{\beta 5}} \times \varepsilon$$

The logarithmic estimation of the model is expressed as follows:

$$Ln(EX_{Vjt}) = k + \beta_1 Ln(DIS_{Vj}) + \beta_2 Ln(ER_{Vj}) + \beta_3 Ln(OPEN\_TRADE_{jt}) + \beta_4 Ln(EDIS_{Vj}) + \beta_5 (EVFTA_{Vj}) + \varepsilon$$

where:

- EX_{Vjt} represents the export value from Vietnam to country *j* (measured in USD).
- ER_{Vj} is the exchange rate variable between the average exchange rate of Vietnam and the EU partner country *j* in year *t* (measured in VND per unit of the partner country's currency). According to theory, exchange rate policies influence export activities. When the exchange rate increases (Vietnamese currency depreciates), businesses will receive more foreign currency, thereby boosting production, reducing the cost of goods, and promoting export activities. Conversely, an appreciation in the Vietnamese currency implies a decrease in the exchange rate, which has a negative impact on export activities.

Hypothesis 1 (H1): As the VND/foreign currency exchange rate increases, Vietnam's exports will also increase.

- DIS_{Vj} is the geographical distance between Vietnam's capital and country *j* (measured in kilometers). This represents the fundamental and core factor of the gravity model, which indicates the geographical distance between the exporting and importing countries through transportation costs.

Hypothesis 2: The farther the distance between Vietnam and the importing countries, the lower the export of agricultural products.

- $OPEN\_TRADE_{jt}$ is a variable indicating the trade freedom of country *j* in year *t*, ranging from 0 to 100, with higher values indicating greater trade freedom. According to publications by the Heritage Foundation and the Wall Street Journal, this index is calculated based on the following formula:

$$OPEN\_TRADE_{jt} = \left\{\left[\frac{tariff_{max} - tariff_j}{tariff_{max} - tariff_{min}}\right] x100\right\} - NTB_j$$

where $tariff_{max}$ and $tariff_{min}$ are the upper and lower limits (with a minimum of 0) of the tariff rate (%); $tariff_j$ is the country j's average applied tariff rate (%). NTB represents non-tariff barriers and takes on values of 20, 15, 10, 5, and 0, determined as follows:

- Receives a value of 20 when NTB is widely applied to many products;
- Receives a value of 15 when NTB is relatively common across many products;
- Receives a value of 10 when NTB is used to protect specific types of goods or hinder certain types of international trade;
- NTB receives a value of 5 when applied to only a few products;
- NTB receives a value of 0 when it is not used to restrict international trade.

Hypothesis 3: Higher trade freedom leads to increased trade demand.

- $EDIS_{Vj}$ is the economic development gap between the two countries *i* and *j*, calculated as the absolute value of the difference between the average GDP per capita of Vietnam and the partner country (measured in USD).

$$EDIS_{Vj} = |(GDP\ per\ capita\ Vietnam) - (GDP\ per\ capita\ partner\ country)|$$

Hypothesis 4: A larger economic development gap between two countries may increase exports.

- $EVFTA_{Vj}$ is a dummy variable representing the effective EVFTA in the model, taking the value of 1 when the agreement is effective from 2020 and 0 when it is not.

Hypothesis 5: The effective EVFTA increases the export value of agricultural products from Vietnam to the EU member countries.

The coefficients β_1, β_2, β_3, β_4, β_5, β_6, and β_7 represent the impact of the corresponding variables

k is the model constant, and ε is the random error of the model.

The proposed research model was estimated using the Stata software to provide estimation results contributing to promoting the export of agricultural products from Vietnam to the EU market.

5. Research Methods

Through the experimental studies conducted by previous authors, research methodologies consistently employed data tables with estimates using the fixed effects model (FEM), random effects model (REM), and ordinary least squares (OLS) to determine the impact of factors on international trade flows between countries (Van Nen, 2020; Filippini & Molini, 2003; Hatab et al., 2010).

The OLS method is one of the most commonly used approaches. However, the OLS model overlooks time-related factors and differences among cross-sectional units when combining all observations. This implies that the OLS model may neglect the unique characteristics of each country in the panel data (Van Nen, 2020).

The FEM can control unobservable or hard-to-measure variables (Filippini & Molini, 2003). This means that the FEM can address the omission of time-related factors and unique characteristics of countries that may affect the dependent variable of the OLS model. However, the FEM has a limitation in measuring or estimating analyses for variables that do not change over time (Dinh, 2014). In the authors' research model, there is a geographical distance variable that does not vary over time.

The REM is a regression model that can control and separate individual effects from independent variables to estimate the impact on the dependent variable. In the model, individual effects are assumed to be random and not correlated with how independent variables change. The REM has overcome a limitation of the FEM as it can explain and estimate factors that do not change over time, such as geographical distance in the author's model (Dinh, 2014).

In general, each model has its advantages and limitations. Therefore, the authors performed regressions on each model and provided arguments to choose the most appropriate estimation method for the research model.

6. Research Results

Descriptive statistics provide a preliminary overview of the model and the dataset through figures presented for the mean, standard deviation, maximum, and minimum values of each variable in the model. Table 1 presents the descriptive statistics of the model, including the export values of agricultural products from Vietnam to the EU member countries, the average exchange rate of the Vietnamese currency against the currencies of partner countries, the geographical distance between countries, the economic development distance between countries, and the dummy variable representing the EVFTA between Vietnam and the EU.

Table 1. Descriptive statistics (Research findings)

	Observations	Mean	Standard deviation	Minimum	Maximum
LNEX	506	23.8083	1.99713	18.3588	27.6476
LNER	506	9.273571	1.505015	3.93961	10.61934
LNDIST	506	9.029578	.0976728	8.873748	9.264355
LNEDIS	506	10.05883	.7917337	7.216276	11.51112
LNOPENTRADE	506	4.230362	.0967333	3.885679	4.433195
EVFTA	550	.0909091	.2877643	0	1

Table 1 shows 506 observations for all variables. This includes 23 EU member countries, excluding Croatia, Luxembourg, Malta, and the Czech Republic. Croatia joined the EU in 2014. Luxembourg, Malta, and the Czech Republic engage in negligible trade with Vietnam. Each country collected data from 2001 to 2022.

Table 2. Correlation coefficient matrix for each pair between the independent variables and dependent variable (Research findings)

	LNEX	LNER	LNDIST	LNEDIS	LNOPEN~E	EVFTA
LNEX	1.0000					
LNER	0.3034*	1.0000				
LNDIST	0.4623*	0.1972*	1.0000			
LNEDIS	0.4005*	0.3390*	0.3309*	1.0000		
LNOPENTRADE	0.0146	0.1307*	0.0249	0.6050*	1.0000	
EVFTA	0.0912*	0.0558	-0.0000	0.1022*	0.1499*	1.0000

* Significance level at 5%

The results of the Pearson correlation analysis show that the directional effects of independent variables, including exchange rate, geographical distance, economic development distance, trade openness, and the EVFTA, have a positive correlation with the dependent variable, the export value of agricultural products from Vietnam to the EU. Notably, the trade openness variable does not have statistical significance (p-value > 0.05), but the authors decided to retain the variable and proceed with the model. In some cases, even though the Pearson correlation analysis shows that a variable is not statistically significant, when testing and selecting the model, the variable may have a statistically significant value in the research model. The

authors continued to perform regression using the OLS method, along with diagnostic tests, and assessed the appropriateness of the method for their model.

The results of the OLS model estimation (Table 3) indicate that variables such as exchange rate, geographical distance, and the EVFTA have positive effects on the export value of agricultural products from Vietnam. Conversely, trade openness variables have a negative impact on the model. All variables have p-values < 0.05, indicating their statistical significance in the model. In addition, the authors conducted a multicollinearity test, and the estimation results show that there is no multicollinearity issue in the model.

Table 3. OLS model and multicollinearity test (Research findings)

Variance	Coefficients	P-value	VIF	1/VIF
LNER	0.179361	0.001	1.15	0.870343
LNDIST	6.28571	0.000	1.19	0.837131
LNEDIS	1.028543	0.000	2.03	0.492364
LNOPENTRADE	-5.569219	0.000	1.70	0.588644
EVFTA	0.5723904	0.024	1.02	0.976014
Prob > F = 0.0000			Mean VIF = 1.42	
R-squared = 0.3500				
Adjusted R-squared = 0.3435				

To determine whether the model experiences heteroscedasticity, the authors used the Breusch–Pagan/Cook–Weisberg test for heteroscedasticity. With the null hypothesis H_0: constant variance. From the estimation results in Table 4, it can be observed that accepting this null hypothesis implies that the model does not exhibit heteroscedasticity. The authors then conducted an autocorrelation test of the model.

Table 4. Result of the test for heteroscedasticity (Research findings)

H_0: constant variance		
Model	**Chi-square**	**P-value**
Pool OLS	1.62	0.2024

Table 5. Result of the autocorrelation test (Research findings)

H_0: no first–order autocorrelation		
Model	**F(1,22)**	**P-value**
Pool OLS	30.265	0.0000

Through the first-order autocorrelation test, a p-value < 0.05, leading to the rejection of H_0 and indicating that the model exhibits first-order autocorrelation. Based on the estimation results, the authors concluded that the OLS model should not be selected because it exhibits a flaw in the form of autocorrelation, rendering the assessment of the impact of independent factors inaccurate. Therefore, the OLS model was replaced with the FEM and REM. The authors proceeded with the next two models, the FEM and REM, and obtained the estimation results presented in Table 6.

Table 6. The FEM and REM (Research findings)

Model Variables	FEM	REM
LNER	0.2020451***	0.2079226***
	(4.62)	(4.78)
LNDIST	-	3.35422
	-	(0.326)
LNEDIS	2.139549***	2.063788***
	(15.06)	(14.78)
LNOPENTRADE	-2.737003***	-2.81604***
	(-3.08)	(-3.20)
EVFTA	0.11072	0.1342888
	(0.98)	(1.19)
R-squared	0.4895	0.4894
	F = 114.84	Wald = 451.95

Notes: *, **, and *** correspond to significance levels of less than 10%, 5%, and 1%, respectively; the values in parentheses represent z- or t-test statistics.

We proceeded to perform the Hausman test to choose between the FEM and REM with the hypotheses of the test as follows:

H_0: The REM is appropriate.

H_1: The FEM is appropriate.

Table 7. Result of the Hausman test (Research findings)

The Hausman test	
Chi-square	**P-value**
18.85	0.0008

From the results of the Hausman test, P-value = 0.0008 < 5%. Therefore, we reject the null hypothesis (*H_0:* The REM is appropriate) and accept the alternative hypothesis (*H_1:* The FEM is appropriate). After selecting the appropriate model, the authors conducted diagnostic tests for the FEM, which include testing for heteroscedasticity and autocorrelation.

Table 8. Result of the test for heteroscedasticity (Research findings)

H_0: constant variance		
Model	**Chi-square**	**P-value**
FEM	723.43	0.0000

The results of the Breusch-Pagan Lagrange multiplier (LM) test lead to the rejection of the null hypothesis H_0: constant error variance (P-value < 0.05). This indicates that the FEM exhibits heteroscedasticity.

Table 9. Result of the autocorrelation test (Research findings)

H_0: no first-order autocorrelation		
Model	**Chi-square**	**P-value**
FEM	30.265	0.0000

The results of the Wooldridge test lead to the rejection of the null hypothesis H_0: no first–order autocorrelation (P-value < 0.05), indicating that the FEM has an issue of autocorrelation.

In general, the diagnostic tests for deficiencies in the FEM show that it suffers from problems of heteroscedasticity and autocorrelation. These deficiencies impact the model's results, leading to biased estimates and statistical insignificance and rendering the coefficients unreliable. Considering these shortcomings, the authors addressed the model's deficiencies by employing generalized least squares (GLS) estimation and present the results in Table 10.

Table 10. GLS estimation results and remediation of deficiencies (Research findings)

Variables	Coefficient	P-value	z-test
Constant	-48.3471	0.000	-4.65
LNER	0.1250689	0.019	2.34

Continuation of Table 10			
LNDIST	7.430618	0.000	6.67
LNEDIS	1.270819	0.000	10.83
LNOPENTRADE	-2.05941	0.002	-3.10
EVFTA	0.0321284	0.673	0.42
Prob > chi2 = 0.0000			
Dependent variable: lnex			
Observations: 506			
Number of the group members: 23			

After remedying the deficiencies through the GLS model, we obtained an R-squared coefficient of 48.95% (the same as the FEM). This indicates that the factors in the model collectively influence export activities by 48.95%, including variables such as exchange rate, geographical distance between countries, economic development distance between countries, and trade openness of countries. The authors' most suitable model is as follows:

$$Ln(EX_{Vjt}) = -48.35 + 7.43Ln(DIS_{Vj}) + 0.12Ln(ER_{Vj}) - 2.06Ln\left(OPEN_{TRADE\,jt}\right) + 1.27Ln(EDIS_{Vj})$$

In it, the variable representing the EVFTA has a p-value > 0.05, indicating that the variable is not statistically significant in the model. This implies that the EVFTA does not have a statistically significant impact on the export activities of Vietnam and the EU member countries. However, despite the lack of statistical significance, the EVFTA has a positive impact on export activities. The effects of statistically significant variables will be explained later.

First, the exchange rate variable of the Vietnamese currency against the currency of partner countries has a positive impact on the agricultural export turnover of Vietnam. However, the degree of influence of the exchange rate variable is the weakest among the variables. When the exchange rate increases by 1%, export turnover will also increase by 0.12%. This indicates that the agricultural export of Vietnam is influenced by the currencies of partner countries. The results obtained from the model are consistent with the hypothesis and previous experimental studies that have investigated this variable.

Second, geographical distance has a positive impact on the agricultural export turnover of Vietnam. The estimation results for the geographical distance variable contradict the authors' initial hypothesis. When other factors remain constant, an increase of 1 km in geographical distance between countries leads to a decrease of 7.43% in the agricultural export turnover of Vietnam. Despite its significant geographical distance, the EU is considered a major trading partner consistently holding a high position among Vietnam's agricultural importers. Additionally, after the COVID-19 pandemic, people in Western countries tend to focus on health and consume more fruits and agricultural products to support their health.

Third, the trade openness of participating countries has a negative impact on Vietnam's agricultural export to the EU member countries. This contradicts the findings of previous studies. When trade openness increases by 1%, the value of Vietnam's agricultural export turnover decreases by 2.06%. As the trade openness of countries increases, Vietnam's agricultural products in these markets face more competition from domestic products or products imported from other countries. Moreover, Vietnam's agricultural products are mainly raw products exported, resulting in low competitiveness in the EU market. Therefore, increased trade openness indicates greater and broader trade activities, which pose challenges to the competitiveness of Vietnam's agricultural products in these markets.

Fourth, the economic development distance between countries has a positive impact on export value. When the economic development distance increases by 1%, the export value of agricultural products increases by 1.27%. This aligns with the hypothesis put forth by the authors. An increase in economic development distance or an increase in similarity between two countries (a smaller economic development distance) makes trade, especially agricultural exports, more accessible and convenient. When countries have higher similarity in economic development distance, it implies that they can more easily meet the needs and preferences of consumers in the importing country.

The estimation results show that various factors influence Vietnam's agricultural export to the EU member countries, and these factors can either positively promote or negatively hinder export activities.

7. Conclusion and Recommendations

In conclusion, various factors including exchange rates, geographical distance, and economic disparity have a positive impact on Vietnam's agricultural export activities. Conversely, trade openness has a negative effect on agricultural exports to 23 EU member countries from 2001 to 2022. The analysis also indicates that the EVFTA has not influenced Vietnam's agricultural export activities since its effective date of August 1, 2020. However, recent studies suggest that the agreement is becoming a driving force for Vietnam's agricultural exports and will be a supportive tool in reducing trade barriers. On the basis of the estimation results and practical export activities, the authors propose several policy recommendations to enhance agricultural export activities:

1) *Implementing flexible exchange rate policies to boost domestic export activities:* The research results show that exchange rate policies positively impact export activities. However, these policies need to be adjusted reasonably to promote agricultural exports without causing domestic financial impacts due to changes in exchange rate policies. Sudden changes in exchange rates may lead to misunderstandings in trade relations and accusations from other countries; therefore, exchange rate policies require careful evaluation based on actual conditions and international trade relations.

2) *Focusing on market development in countries with large geographical distances:* This implies that the larger the geographical distance, the higher the transportation costs. Therefore, concentrating on market development in these countries helps strengthen market positions, instill confidence in products, and foster trade. The EU member countries are considered potential markets for agricultural exports in the coming years because of changing consumer preferences for health-related foods after the pandemic. The advantages of trade agreements between Vietnam and the EU countries also contribute to building Vietnam's position in the market. Using these advantages and creating potential markets for Vietnamese agricultural products in countries with large geographical distances will optimize and promote Vietnam's agricultural export to the EU countries.

3) *Enhancing the ability to meet consumer demands in large markets:* As economic similarities increase, the ability to meet the needs of consumers in importing markets also increases. Therefore, focusing on the quality, production processes, and processing of agricultural products from the initial stages helps control the supply chain to meet the requirements of imported agricultural products. Governments and relevant authorities should regularly update information on policies for agricultural products and promote improvements to increase productivity and quality in the industry, thereby boosting Vietnam's agricultural exports to large markets.

4) *Promoting the development of agricultural products in terms of both quality and quantity:* For countries with high trade openness, there are increased demands for imported goods, creating challenges for the export of goods, including agricultural products. Therefore, supporting policies for businesses, traders, and farmers in the agricultural sector to improve quality and stay informed about requirements for agricultural products is crucial. In addition, upgrading techniques and technology in the agricultural sector helps achieve the best quality and high yield, providing a competitive edge in the international market in terms of both price and quality.

To implement these policy recommendations, businesses in the sector need to be active and comply with regulations on importing goods in the EU member countries to minimize violations of import regulations for goods in general and agricultural products in particular. Understanding and grasping trade information, agreements, and policies of other countries can help businesses promote export activities by taking advantage of trade policy agreements. Governments and relevant agencies also need to actively support and perform communication, guidance, and notifications of agreements, preferences, and compliance requirements for domestic industries and businesses to obtain accurate and timely information. These policy recommendations will contribute to the development and improvement of Vietnam's agricultural export to the EU member countries.

In summary, this research systematized the theoretical basis for building a model to study factors affecting a country's trade in general or the import and export of a specific product from a country to a country or specific market partners. This article, with a detailed analysis of the export of Vietnamese agricultural products to the EU market, has partly shown the impact of economic factors on Vietnam's export activities. This article will be a useful document for Vietnamese management agencies in promulgating policies to support the export of Vietnamese agricultural products.

8. Limitations and Further Study

The article attempted to build a model of the basic factors affecting Vietnam's agricultural exports to the EU. However, the study does not mention the impacts of Vietnam's tariff and non-tariff policies and European countries on Vietnam's agricultural product exports to the EU. The authors hope that there will be other future studies to fill the gaps in this issue.

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