

2nd International Conference on Economy, Management and Entrepreneurship (ICOEME 2019)

# Research on the Impact of Trade Facilitation on Trade Between Vietnam and Europe

Empirical Analysis Based on Commercial Gravity Model

Riming Cui School of Economics Liaoning University Shenyang, China

Van Day Dao School of Economics Liaoning University Shenyang, China

Kieu Oanh Do University of Economics and Business Vietnam National University Ha noi, Vietnam

Abstract—The aim of this research is to calculate and measure the level of trade facilitation of Europe countries. The research selected 5 indicators of trade facilitation including infrastructure, customs environment, e-commerce, policies environment and financial environment to measure the degree of trade facilitation of Europe countries and use the Gravity Model to empirically analyze the effect of trade facilitation Europe countries to trade between Vietnam and Europe. The research result shows that trade facilitation profoundly affects Vietnam's export and import flow. Based on the analysis results, the paper gives some recommendations to boost Vietnam's trade facilitation.

#### Keywords—trade facilitation; trade; Gravity Model; Europe

## I. INTRODUCTION

In the tendency of economic international integration, Vietnam economy and trade have been more and more deeply integrated into the world economy. Vietnam joined the Association of Southeast Asian Nations in 1995 (ASEAN); and the World Trade Organization (WTO) in 2007. Up to present, Vietnam has signed 12 Free Trade Agreements (FPA) (of which 7 FTA have been signed with AEAN members, the rest 5 FTAs have been signed with Chile, Japan, Korea, EEC, CPTPP), The Comprehensive and Progressive Agreement for Trans-Pacific Partnership Preamble (CPTPP) has come into effect since January 14, /2019. After 32 of renovation (1986-2017) Vietnam has gained the GDP of 6.6%. Vietnam is one of the countries which have the leading economic growth in the world. The rapid increase in trade is one of the factors contributing to the growth of GDP for the past years. Europe is one of the most and foremost trading partners of Vietnam. In 2017, Europe was one of the 3 biggest trading partners of Vietnam. The trade ratio accounted for 24.6% of the total trading exports. In the period 2010-2017 solely, the commercial scale of Vietnam with European countries has increased from 15.5 billion USD to 58.5 billion USD, a growth rate of 274.52% (see "Table I"). It is obvious that Vietnam-Europe trade has played a significant role in Vietnam economic development. The trade facilitation was the key factor which has made great contribution to the growth of Viet-Europe trade. Boosting Viet Nam-Europe commercial partnership shall be the key to the success in Vietnam economic development. Especially in present situation when trade protectionism and commercial conflicts have emerged, trade facilitation has become more and more vital to the development of Vietnam.

Year	Export (Bil.USD)	Import ((Bil.USD)	Trade ((Bil.USD)	Annual change trade (%)
2010	10	5.5	15.5	
2011	20.12	10.95	31.07	100.5
2012	23.58	10.6	34.18	10.0
2013	28.1	11.44	39.54	15.7
2014	31.8	10.67	42.47	7.4
2015	34.29	12.26	46.55	9.6
2016	37.86	13.51	51.37	10.4
2017	43.04	15.01	58.05	13.0

TABLE I.VIETNAM-EUROPE TRADE DURING 2010-2017

<sup>a.</sup> (Source: Vietnam annual statistics, General Statistics Office of Vietnam)

There have been many domestic and international researches on trade facilitation. The internal scholars have focused on 3 aspects of trade facilitation:

The First: the impacts of this facilitation on trade: Trade facilitation has made contribution to the reduction of trade costs and trade growth, improvement of business environment. In their researches, the international scholars often apply the Gravity Model and the model Computable General Equilibrium (CGE) to assess the impacts of trade facilitation of trade facilitation on commercial activities. One of the typical researches is the one conducted by Wilson Mann and Otsuki (2003) [1]. The research focuses on the relationship between trade facilitation and trading flow in 75 countries in the period of 200-2001. In this research, the author has applied the Gravity Model with four criteria including infrastructure, customs environment, physical environment, e-commerce to analyze the impacts of trade facilitation on the commercial activities. The result shows that there was a considerable increase in the trade growth thanks to trade facilitation. In details: every 1% increase in trade facilitation creates an increase of 9.7% equivalent to 377 million USD in trade growth. Customs improvement creates an increase of 330 million USD (0.8%), improvement of political institutional environment makes the trade growth rise 83 million USD (2.1%), the improvement of infrastructure cause an increase of 154 billion USD (4%). T. Hertel, T. Mirza (2009) [2] has also applied 4 criteria to assess trade facilitation. The research proved that trade facilitation has had certain impact on the commercial scale between South Asia with the remaining parts of the world. The trade facilitation caused an increase of 5.8 billion USD (75%) in domestic trading, 30.8 billion USD (22%) in foreign trading. India and Pakistan are the countries, which have the most rapid development growth. Creating trade facilitation has great impacts on both. Shepherd (2009) the author of the research on the trade facilitation in South Asia proves that an increase of 1% in trade facilitation creates an increase of 7.5% (22 billion USD) in trade growth. Zhang Ya Bin (2016) — the author of the research on the trade facilitation of China within the Silk Road prove that 1% increase in trade facilitation makes contribution of 4.35% in China export. Ran Qi Zhao, Yang Dan Ping (2018) — author of trade facilitation research in Europe prove that 1% increase in EU trade facilitation creates China trade facilitation increase up to 1.7864%.

The Second: regarding the assessing indicators in trade facilitation. Initially, the international scholars adopt the 4 assessing criteria of Wilson Mann and Otsuki (2003) including infrastructure, customs environment, institutional environment, e-commerce. However, there are differences in secondary indicators. For instance, Ran Qi Zhao, Yang Dan Ping (2018) have used 15 secondary indicators, Zhang Shuhui (2018) have used 19 secondary indicators. Then due to the continuous economic development, financial environment has great impact on trade facilitation, therefore many scholars such as Zhang Ya Bin (2016), Gao Zhi Gang, Song Ya Dong (2018)... have added the finance criterion to upgrade the total primary criteria in assessing trade facilitation to 5 indicators.

The Third: regarding identifying ratio of each criterion. The two common methods applied is the average method and hierarchy method. For instance, Ran Qi Zhao, Yang Dan Ping (2018) have applied the Analytic Hierarchy Process to identify the ratio.

Up to present, there have been no international researches on Vietnam trade facilitation. These researches have been referred to in the researches by organizations such as APEC (2004), OECD (2012). The authors like Ben Shepherd, John S. Wilson (2009) show in their researches that the trading flows in Southeast Asia are especially sensitive to informatics. transportation infrastructure. and communication. The improvement in infrastructure created an increase of 7.5% (22 billion USD) in trading flow. Itakura, K. (2014), the author of the research on facilitating trade and service among ASEAN members shows that the reduction of trading barriers have had great impacts on trading of the countries. Currently there have no domestic researches on impacts of the trade facilitation on Vietnam trade. The domestic scholars pay attention to some aspects such as trade facilitation and creating policy harmony in logistics in ASEAN countries [3], and the Trading Facilitation Agreement WTO- opportunities and challenges to Vietnam [4].

Despites the differences in the research objects, assessing indicators, the researches prove that promoting trade facilitation will push trade growth. However, there has been no separated research assessing the specific impacts on of European countries trade facilitation on Vietnam-Europe trade.

This research aims at identifying the level of impact of trade facilitation of European countries to Vietnam-European trade with the Gravity Model. The research questions are: What are the impacts of trade facilitation of Europe on Vietnam-Europe trade? What methods make trade facilitation more effective? The contribution of the research is to identify the impacts of trade facilitation of European countries on Vietnam-Europe trade. Concurrently, the research also identifies the detailed impacts of the trade facilitation indicators on Vietnam-Europe trade. Based on the results, the research proposes specific solutions and policies to boost up Vietnam export.

II. BUILDING UP AND MEASURING THE SYSTEM OF INDICATORS FOR ASSESSING TRADE FACILITATION

## A. Selection of Indicators

Among a variety of trade facilitation assessing indicators, the one proposed by Wilson is of the most typical method. The study is based on Wilon's method in assessing trade facilitation and the previous researches, based on the research aims, factors affecting Vietnam-Europe trade facilitation including: infrastructure, customs, e-commerce, financial environment serve as the primary factors to identify the levels of trade facilitation and the system of 21 secondary indicators are built up to assess the level of trade facilitation. Details of secondary indicators are shown in the "Table III" below.

#### B. Sources and Data Process

The research has selected 21 secondary indicators from 2010 to 2017 which are extracted from The Global Competitiveness Report published by WEF (World Economic Forum) and the report on CPI (Corruption Perceptions Index) reported by the World Transparency on the period from 2008 to 2017. The scale of the indicators is not the same; most indicators range from 0 to 7; there are two indicators that range from 0-100 and are the index of corruption and the number of internet users. The higher score each criterion gets, the higher level of trade facilitation is.

According to the above analysis, the data source of the secondary indicators on trade facilitation is not equivalent and these data need to be standardized. The standardization of the indexes creates advantages for comparison and calculation of indicators of trade facilitation.

The method applied: Xij = Zij / Zjmax, Zij is the initial value of the level 2 trade facilitation index; Zjmax is the maximum value of the trade facilitation index of thr level 2; Xij is the initial standardized trade facilitation value after standardization, which takes a value of 0-1.

## C. Identifying Ratio of Assessing Indicators of Trade Facilitation

The research has applied the Analytical Hierarchy Process (AHP) proposed by Saaty to identify the criterion of ratio. First, the research collected opinions of experts on the priority to identify the hierarchy n is the number of factors in the comparison matrix. IC (consistency index) is determined by the following steps: (Experts' evaluation is made on the basis of comparative scales in "Table II"). Then the comparison pair matrix is set up.

TABLE II. COMPARISON SCALE

Level of significance	Definition	Explanation
1	Equal significance (Equal)	2 factors are of equal importance
3	Either of the factors holds greater significance than the other. (moderate)	Experience and judgment place more focus on either of the factors.
5	Strong significance between both factors (strong)	Experience and judgment placed more on either of factors
7	Very strong significance expressed of either factors opposed to the remaining one (very strong)	Greater priority given to either of factors and its expression in practice
9	Extreme significance of either of factors compared to the other (extreme)	Obvious significance of either factor over the possible level
2,4,6,8	The medium level among the above- mentioned levels	There must be an agreement between 2 levels of judgment

After calculating ratio for each level, and each group of indicators, the consistency ratio (CR) is calculated to check the consistency. The CR is calculated by the formula:

CR=CI/RI, in which RI (Random Index) is identified from the 3 given tables:

TABLE III.	THE CLASSIFICATION OF RANDOM INDEX (RI)
------------	---

Ν	3	4	5	6	7	8	9	10
RI	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

In "Table III": N is the number of factors in the comparison matrix. IC (Index Consistency) is determined by the following steps:

- Calculating total vector with the ratio = comparison matrix x ratio vector - Calculating consistency vector = vector of total ratios/ ratio vectors
- Identifying λmax (separate value of comparison matrix) and CI: + λmax = average value of

consistency vectors +  $CI = (\lambda max - n) / (n - 1)$ . The consistency ratio must be equal or smaller than 10%, and then the greater ratio is considered right. The values greater than 10% need to be done again. Software assists the process of ratio identification. The research has applied the software Mat lab to identify the primary indicators. Results of ratios of primary indicators are as bellows ("Table IV"):

ΓABLE IV.	COMPARISON MATRIX OF PAIRS AND RATIOS

Criteria for assessing trade facilitation	Institutional environment	Infrastructure	Customs environment	E-commerce	Finance environment	Weight
Institutional environment	1	1.0	1	2.00	2.00	0.251
Infrastructure	1.00	1	1	1	3	0.234
Customs environment	1.00	1.00	1	1.00	1	0.194
E-commerce	0.50	1.00	1.00	1	3.0	0.209
Finance environment	0.50	0.33	1.00	0.33	1	0.113

Consistent ratio CR = 0.048 < 0.1, which ensures consistency. Similar to method of the weighting for primary indicators, the weight of the level 2 criteria can be calculated.

Priority weight = specific weight x corresponding to the level 1 factor (see "Table V") for details).

Primary indicators	Ratio	Secondary indicators	Separate indicators	Priority indicators	Sign for priority ratio	Scale	Scale of secondary indicators
		Quality of roads	0.3116	0.0728	W11	1-7	X11
		Quality of railroad infrastructure	0.1277	0.0298	<b>W</b> <sub>12</sub>	1-7	X <sub>12</sub>
Infrastructure	0.2337	Quality of port infrastructure	0.2804	0.0655	W <sub>13</sub>	1-7	X <sub>13</sub>
		Quality of air transport infrastructure	0.2804	0.0655	$W_{14}$	1-7	$X_{14}$
		Prevalence of trade barriers	0.2188	0.0424	W <sub>21</sub>	1-7	X <sub>21</sub>
C	0 1027	Trade tariffs	0.0938	0.0182	<b>W</b> <sub>22</sub>	1-100	X <sub>22</sub>
Customs environment	0.1937	Burden of customs procedures	0.5938	0.1150	W <sub>23</sub>	1-7	X <sub>23</sub>
		Corruption Perceptions Index	0.0938	0.0182	<b>W</b> <sub>24</sub>	1-100	X <sub>24</sub>
	0.2512	Intellectual property protection	0.2066	0.0519	W <sub>31</sub>	1-7	X <sub>31</sub>
		Public trust in politicians	0.0611	0.0153	W <sub>32</sub>	1-7	X <sub>32</sub>
		Judicial independence	0.0611	0.0153	W <sub>33</sub>	1-7	X <sub>33</sub>
Institutional		Burden of government regulation	0.0966	0.0243	$W_{34}$	1-7	X <sub>34</sub>
environment		Efficiency of legal framework in settling disputes	0.1953	0.0491	W <sub>35</sub>	1-7	X <sub>35</sub>
		Transparency of government policymaking	0.2290	0.0575	W <sub>36</sub>	1-7	X <sub>36</sub>
		Business costs of crime and violence	0.1503	0.0378	W <sub>37</sub>	1-7	X <sub>37</sub>
		Availability of latest technologies	0.7235	0.1510	$W_{41}$	1-7	$X_{41}$
E-commerce	0.2087	Firm-level technology absorption	0.1932	0.0403	$W_{42}$	1-7	X <sub>42</sub>
		Individuals using Internet	0.0833	0.0174	$W_{43}$	1-100	$X_{43}$
		(Availability of financial services)	0.7143	0.0806	W <sub>51</sub>	1-7	X <sub>51</sub>
Finance environment	0.1129	Financing through local equity market	0.1429	0.0161	<b>W</b> <sub>52</sub>	1-7	X <sub>52</sub>
		Ease of access to loans)	0.1429	0.0161	W52	1-7	X52

 TABLE V.
 RATIOS OF TRADE FACILITATION AT DIFFERENT LEVELS

Source: Calculated by the author

## III. ANALYSIS OF CALCULATION OF TRADE FACILITATION OF VIETNAM AND MAJOR TRADING PARTNERS FROM EUROPEAN COUNTRIES

Based on processing of the above data and the ratios of the indicators related to trade facilitation, the paper has drawn out the formula for calculating the total indicators of trade facilitation as follows:

 $\begin{array}{l} TFI_{j}=\!W_{11}X_{11}+W_{12}X_{12}+W_{13}X_{13}+W_{14}X_{14}+W_{21}X_{21}+\\ W_{22}X_{22}+W_{23}X_{23}+W_{24}X_{24}+W_{31}X_{31}+W_{32}X_{32}+W_{33}X_{33}+\\ \end{array}$ 

 $\begin{array}{l} W_{34}X_{34}+W_{35}X_{35}+W_{36}X_{36}+W_{37}X_{37}+W_{39}X_{39}+W_{41}X_{41}\\ +W_{42}X_{42}+W_{43}X_{43}+W_{44}X_{44}+W_{51}X_{51}\\ +W_{52}X_{52}+W_{53}X_{53}+W_{54}X_{54}\end{array}$ 

a.

In the formula,  $X_{ij}$  is the value of processed secondary indicators of trade facilitation.  $W_{ij}$  is the priority of the secondary indicators and summary to obtain TFI of AEAN nations. Through calculations, the ratios of trade facilitation of European countries in 2017 are shown in "Table VI":

TABLE VI.	RESULTS OF CALCULATION OF TRADE FACILITATION OF MAJOR TRADING PARTNERS IN EUROPEAN COUNTRIES WITH V	/ietnam, 2017
	Resolution of Trade Trade Trade of the box Trade to Contract of the box of th	101111111, 2017

ніт	Countries	TFI	Level of trade facilitation	HIT	Countries	TFI	Level of trade facilitation
1	Albania	0.555	No trade facilitation	18	Luxembourg	0.791	average good level
2	Austria	0.736	average good level	19	Netherlands	0.825	very good level
3	Belgium	0.742	average good level	20	Norway	0.782	average good level
4	Bulgaria	0.602	Average level	21	Poland	0.628	Average level
5	Croatia	0.589	Not advantage	22	Portugal	0.696	Average level
6	Czechia	0.652	Average level	23	Romania	0.538	Not advantage
7	Denmark	0.758	average good level	24	Russian Federation	0.614	Average level
8	Estonia	0.725	average good level	25	Serbia	0.512	Not advantage
9	Finland	0.849	very good level	26	Slovakia	0.606	Average level
10	France	0.721	average good level	27	Slovenia	0.634	Average level
11	Germany	0.776	average good level	28	Spain	0.671	Average level
12	Greece	0.571	Not advantage	29	Sweden	0.793	average good
13	Hungary	0.609	Average level	30	Switzerland	0.826	very good level

HIT	Countries	TFI	Level of trade facilitation	ніт	Countries	TFI	Level of trade facilitation
14	Ireland	0.712	average good level	31	Ukraine	0.518	Not advantage
15	Italy	0.637	Average level	32	United Kingdom	0.777	average good level
16	Latvia	0.604	Average level	33	Vietnam	0.528	No trade facilitation.
17	Lithuania	0.645	Average level				

Source: Calculated by the author

To identify the classification of level of trade facilitation, domestic and international scholars have classified the trade facilitation into different level. In this research, the author has applied the method of Ceng Zheng, Zhou Qian (2008). Accordingly, the trade facilitation is divided into 4 levels: If TFI  $\geq$  0.8: very good level of trade facilitation;  $0.7 \leq TFI < 0.8$ : average good level;  $0..6 \leq TFI < 0.7$ : Average level, TFI < 0.6: No trade facilitation. The "Table VI" shows that the trade facilitation of Vietnam is listed in the range of NO facilitation. A large majority of European countries have average good level of trade facilitation.

## IV. ANALYSIS OF TRADE FACILITATION IN IMPORT-EXPORT TRADING OF VIETNAM

## A. Building Model and Data Description

The paper has researched how international and domestic scholars applied the Gravity Model used in their research.

This is the model which was developed by Tinbergen (1962) and Poyhonen (1963) based on the Gravity Principle of Newton. The model has been used in trading to forecast that bilateral trading depends on the scales of 2 economies and distance between the two. After this model was introduced, there have been many researchers who have applied and developed it such as Anderson J.E. (1979), Bergstrand J. H(1985), Gbetnkom D and Sunday A. Khan(2002),... Based on current research and basic estimated variants of the Gravity Model, the paper has added new variables including trade facilitation, openness of economy, BORDER. This time, the model will carry the below form ("Table VII"):

 $LnTrade_{ijt} = \alpha \theta + \alpha_1 LnGDP_{jt} + \alpha_2 LnPOP_{jt} + \alpha_3 LnOPEN_{jt} + \alpha_4 LnDIST_{ij} + \alpha_5 LnTFI_{it} + \alpha_6 WT0 + \alpha_7 APEC + \varepsilon_{ij} (2)$ 

TABLE VII. EXPLANATION OF VARIABLES MEANING, THEORETICAL DISRUPTION AND SOURCE OF D	<b>)</b> ATA
---	--------------

Variables	Function	Meanings	Expectation	Data source
TRADE <sub>ij</sub>	Turn-over of bilateral trade between Vietnam and country j	Reflecting the trading level between Vietnam and ASEAN countries (i: Vietnam, j: remaining ASEAN countries)	/	UN COMTRADE ( Unit: USD)
GDP <sub>jt</sub>	GDP of country j year t	Reflecting potential trading demand, greater economic scale, the higher trading flow	+	World Bank (Unit: USD)
POP <sub>jt</sub>	Population of country j year t	Greater world population may cause reduction of international trade due to domestic labor distribution	Not identified	Data source of World Bank ( Unit: people)
DIST <sub>ij</sub>	Distance (direct way) between capitals of 2 countries	Greater distance, higher transportation cost causing disadvantages for international trade	_	https://www.timeandd ate.com/worldclock/d istance.html (Unit: Km)
<b>OPEN</b> <sub>jt</sub>	Trading openness of country j year t	The greater training openness, the higher demand for international demand	+	UN COMTRADE
TFI <sub>jt</sub>	Trade facilitation of country j year t	Trade facilitation causes reduction in trading costs and barriers, encourage bilateral trade	+	Proposed and calculated by author
WTO	DummyVariable,WorldTradeOrganization	Member of WTO gets greater bilateral trade. Receiving the value of 1 if being the member of WTO, 0 for not being member of WTO	+	https://www.wto.org/
APEC	Dummy Variable, Asia-Pacific Economic Cooperation	Being member of APEC gets greater trade facilitation. Receiving the value of 1 if being the member of APEC, 0 for not being member of APEC	+	https://www.apec.org/

## B. Results of Experiment Analysis

This study uses the data of Vietnam-ASEAN table from 2008-2017 to conduct regression analysis. The research has also applied the Stata 14.0 software to conduct an empirical analysis of the impacts of trade facilitation on Vietnamese trade by Gravity Model using OLS methods, fixed effects (FEM) and random effects (REM). Having selecting appropriate model, the study conducted F Test to choose between OLS and FEM and Hausman Verification to choose between FEM and REM. Through testing, we see that REM model is suitable and reliable. By testing, it can be seen that REM is appropriate and reliable. To test the efficiency of the

regression models, the authors tested the variance change and autocorrelation for FEM model, multicollinearity through Vif test for OLS Pooled. The result shows that the model has both the phenomenon of variance error and the phenomenon of self-correlation of the error, and there is no phenomenon of multicollinearity. According to Wooldridge (2002) how to overcome when variance changes and autocorrelation of the error is to choose Generalized Least Squares (GLS). The general least squares method (GLS) is in fact the ordinary least squares method (OLS) applied to variables that have been modified from a new model that satisfies classical assumptions. Therefore, the parameters



estimated from the new model will be more reliable. Because of these reasons, the article only uses the results of the regression model with the general least squares method (GLS) in the following "Table VIII" to analyze and explain the results.

## C. Overall Analysis

The impact of trade facilitation on Vietnam trade is described as follows:

Variables	OLS	FEM	REM	FGLS	
LnGDP <sub>jt</sub>	0.810***(11.23)	(0.13) (-0.53)	0.806***(7.53)	0.810***(11.38)	
LnPOP <sub>jt</sub>	0.544***(6.64)	0.486***(3.56)	0.675***(6.12)	0.544***(6.72)	
LnOPEN <sub>jt</sub>	0.885***(8.51)	3.270***(11.05)	1.684***(8.34)	0.885***(8.62)	
LnDIST <sub>ij</sub>	(0.74) ***(-1.55)	0.63*** (0.23)	(0.30) ***(-0.27)	(0.74) ***(-1.57)	
LnTFI <sub>jt</sub>	1.585***(3.92)	(0.18) (-0.23)	1.11 (1.88)	1.585***(3.97)	
WTO	1.215***(5.58)	0.00 (.)	1.241**(2.35)	1.215***(5.65)	
APEC	0.09*** (0.34)	0.00 (.)	0.36***(0.60)	0.09***(0.35)	
_cons	-8.316***(-1.97)	(5.74) ***(-0.22)	(18.22) ***(-1.92)	-8.316*** (-2.00)	
Ν	320.00	320.00	320.00	320.00	
R-squared	0.88	0.76			
Test F	334.4 (P=0.0000)	15.11(P=0.0000)			
Test of Model Selection					
F-test	Prob > F = 0.0000 <0.05 proves informality of OLS				
Testing Hausman		Prob>chi2 = 0.0000<0.05: select FEM			

Source: Self-calculated by the author

<sup>b.</sup> Notes: \*\*\*, \*\*, \* respectively refers to 1%, 5% and 10%

TABLE IX. TESTING RESULTS OF THE PHENOMENON OF VARIANCE OF CHANGE, MULTICOLLINEARITY AND AUTOCORRELATION

Testing	Value	Result
multicollinearity	VIF <10	Not exist
variance of change	Prob>chi2=0.0000	Exist
autocorrelation	Prob>F=0.0000	Exist

Source: Self-calculated by the author

Similar to the empirical analysis of the impact of trade facilitation of European countries on trade between Vietnam and Europe, the author has also conducted an empirical analysis of the impact of trade facilitation on exports and imports of Vietnam-Europe. The analysis results are summarized in "Table X" below:

TABLE X. THE IMPACT OF TRADE FACILITATION ON IMPORT AND EXPORT OF VIET	ГNAM
--	------

General analysis			Analysis of indicators		
Variables	Exports	Imports	Variable	Exports	Imports
LnGDP <sub>jt</sub>	0.637***(7.22)	1.063***(11.01)	LnHT <sub>jt</sub>	1.991***(6.08)	1.393***(4.05)
LnPOP <sub>jt</sub>	0.698***(6.97)	0.403***(3.87)	LnHQ <sub>jt</sub>	1.296***(2.60)	0.84***(1.64)
LnOPEN <sub>jt</sub>	0.776***(6.10)	1.093***(7.79)	LnTC <sub>jt</sub>	0.73*** (1.82)	1.991***(4.78)
LnDIST <sub>ij</sub>	-0.19*** (0.15)	-3.013***(-4.96)	LnDT <sub>jt</sub>	2.621***(4.86)	2.167***(3.87)
LnTFI <sub>jt</sub>	1.855***(3.76)	1.600***(3.12)	LnTCI <sub>jt</sub>	0.39***(-1.03)	0.876***(-2.27)
WTO	1.221*** (2.24)	0.00 (.)			
APEC	0.07*** (0.23)	0.03** (0.11)			
_cons	-13.57***(-2.66)	6.79***(1.30)			

a. Source: Self-calculated by the author

<sup>b.</sup> Notes: \*\*\*, \*\*, \* respectively to 1%, 5% and 10%

Through the regression results in "Table X", it can be found that the model has a high degree of conformity, the regression results of the other explanatory variables are in line with expectations, ensuring reliability through tests. From the regression coefficients of the variables it can be found that the level of trade facilitation of European countries has the greatest impact on the trade of Vietnam-Europe, every 1% increase in trade facilitation of European countries will make trade between Vietnam and Europe, increase by 1.585%, exports will increase by 1,855%; imports will increase by 1.6%.

The impact of European gross domestic product shows that for every 1% increase in the gross domestic product of European countries, Vietnam's trade increases by 0.81%, exports increase by 0.637%, imports increase by 1,063%. The impact of the European population shows that for every 1% increase in the population of European countries, Vietnam's trade increased by 0.544%, exports increased by 0.698%, imports increased by 0.03%. The impact of the openness of European economies shows that for every 1% increase in economic openness, Vietnam's trade increases by 0.885%, exports increase by 0.776%, imports increase by 1.093%. In terms of geographical distance, reducing trade for every 1% increase of the gap will make Vietnam-Europe trade decrease by 0.74%, export by 0.19%, and import by 3.013%. The coefficient of WTO dummy variable, APEC positively proves that the accession to WTO, APEC helps Vietnam's import-export trade increase.

#### D. Analytical Indicators

To clarify the specific effects of trade facilitation indicators, the research continues to study the impact of trade facilitation indicators on Vietnam's trade. Based on the overall regression, this paper uses a fixed impact model to analyze the impact of trade facilitation indicators. The paper takes turn to analyze the impact of infrastructure (HT), Customs environment of Korea), institutional environment (TC), e-commerce (DT), financial environment (TCI), based on which the research has formed the following 5 regression indicators to assess the impact on Vietnam-ASEAN trade as follows :

 $\begin{array}{rcl} LnTRADE_{ijt} &= \alpha_0 &+ \alpha_1 & LnGDP_{jt} + \alpha_2 LnPOP_{jt} &+ \\ \alpha_3 LnOPEN_{jt} &+ \alpha_4 LnDist_{ij} + \alpha_5 LnHT_{jt} + \alpha_6 & WT0 + \alpha_7 & APEC &+ \\ \epsilon_{ii} & (1) \end{array}$ 

 $\begin{array}{rcl} LnTRADE_{ijt} &= \alpha_0 &+ & \alpha_1 & LnGDP_{jt} + & \alpha_2LnPOP_{jt} &+ \\ \alpha_3LnOPEN_{jt} &+ & \alpha_4LnDist_{ij} + & \alpha_5LnDT_{jt} + & \alpha_6 & WT0 + & \alpha_7 & APEC_{j} + \\ \epsilon_{ij} & (4) \end{array}$ 

Variable	(1)	(2)	(3)	(4)	(5)
LnGDP <sub>jt</sub>	0.792***(13.57)	0.916***(13.98)	0.877***(11.85)	0.738***(11.14)	1.137***(17.32)
LnPOP <sub>jt</sub>	0.566***(8.29)	0.438***(5.66)	0.468***(5.66)	0.611***(8.18)	0.222***(3.29)
LnOPEN <sub>jt</sub>	0.954***(9.56)	0.895***(8.43)	0.917***(8.76)	0.834***(8.19)	1.021***(9.17)
LnDIST <sub>ij</sub>	-1.406***(-2.91)	-0.68 ***(-1.40)	-0.40 ***(-0.82)	-0.79***(-1.69)	-0.64 ***(-1.31)
WTO	1.011***(4.68)	1.330***(6.12)	1.367***(6.35)	1.038***(4.81)	1.427***(6.60)
APEC	0.05***(-0.05)	0.06***(0.24)	0.01***(0.03)	0.29***(1.16)	0.28 ***(-1.11)
$LnHT_{jt}$	1.610***(6.02)				
LnHQ <sub>jt</sub>		1.000*** (2.47)			
LnTC <sub>jt</sub>			0.863***(2.66)		
LnDT <sub>jt</sub>				2.510***(5.82)	
LnTCI <sub>jt</sub>					0.638***(-2.08)
_cons	(2.30)*** (-0.54)	-10.25***(-2.40)	-12.51***(-3.07)	(6.69) ***(-1.64)	-14.43***(-3.51)
N	320.00	320.00	320.00	320.00	320.00
R-squared	0.8894	0.879	0.8793	0.8887	0.8783

TABLE XI. REGRESSION RESULTS ACCORDING TO CRITERIA

a. Source: Self-calculated by the author

 $^{\mathrm{b.}}$  Notes: \*\*\*, \*\*, \* respectively refers to 1%, 5% and 10%

The above "Table XI" shows that the level of impact of various trade-to-trade facilitation indicators of Vietnam-ASEAN increases the trade of Vietnam-ASEAN. Specifically, for every 1% increase in infrastructure, customs environment, institutional environment, e-commerce, the financial environment for trade in Vietnam increased by 1.61%, 1%, 0.863%, respectively. , 2.5%, 0.638%, exports increased by 1.99%, 1.296%, 0.73%, 2.621%, 0.39%, imports increased by 1.393%, 0.84%, 1.991%, 2.167%, 0.876%.

#### V. CONCLUSION AND RECOMMENDATIONS

#### A. Conclusion

Based on the analysis of trade facilitation of European countries, and based on the empirical analysis of the impact of trade facilitation of European countries on Vietnam, the research has drawn out the following conclusions:

- The degree of trade facilitation plays a very important role in promoting Vietnam's trade, compared to GDP, population, trade openness, population, and trade openness in trade facilitation of European countries has a significant role in promoting Vietnam's trade. This shows that the more favorable trade is, the more widely Vietnam's trade expand.
- Indicators of trade facilitation have different impacts on Vietnamese trade. This shows that the development of e-commerce, construction and improvement of infrastructure, institutional reforms, customs environment and financial environment of European countries have great significance in promoting boosting Vietnam's import and export growth.



- The research of the level of trade facilitation shows that in addition to the majority of European countries has relatively favorable trade facilitation, except Albania, Greece and Ukraine, which have unfavorable level of trade facilitation.
- B. Recommendations

Based on the above conclusions, the following recommendations are proposed:

- It is needed to enhance cooperation between Vietnam • and European countries in aspects of trade facilitation from institutional environment, customs environment, infrastructure, financial environment and e-commerce in order to promote trade facilitation. For instance, in cooperation in the field of customs: It is suggested that the following things should be done: sharing customs data, regulating customs to strengthen borders and manage customs procedures, improving customs inspection and quarantine and ensuring customs effectiveness by goods releasing. Enhance cooperation in the financial sector to create transparency in the financial market transparent, have policies of anti-corruption, and more easily mobilize thereby to promote trade. Eliminate capital unfavorable barriers such as administrative procedures, customs inspection, etc., facilitate trade between Vietnam and Europe. European countries need to sign the Vietnam-EU Free Trade Agreement (EVFTA) soon to further promote Vietnam-Europe trade.
- It is necessary for Vietnam and other European countries to reform customs activities and improve efficiency of customs clearance. Customs is responsible for inspecting and supervising goods and preventing transport means; and combating illegal cross-border smuggling and goods transportation; reforming customs policies on customs, applying automatic customs clearance systems, in order to push up customs clearance, which help to reduce trading costs. Well implement the Trade Facilitation Agreement in the WTO to facilitate the export, transit and transshipment of goods of the exporting countries such as simplification of customs procedures and inspection regulations customs control, information technology application, pre-decision, mutual recognition Priority Business Program (AEO), coordinated border management ...
- The financial market must help businesses get access to the convenience of mobilizing capital when necessary, keeping the exchange rate stable, having many capital mobilization channels with low capital use costs, etc. In addition, it is necessary to have measures to improve the quality of human resources of the entire economy; all these measures will help reduce costs to accelerate the process of goods circulation, which thereby promotes trade.

- European countries need to improve the quality of their infrastructure, enhance port infrastructure construction, improve port efficiency, improve key road transport works, improve railway transport infrastructure. Particular attention placed on infrastructure has critical significance that promotes trade facilitation. It is necessary of Europe countries to strengthen connectivity and develop sustainable infrastructure.
- It is needed to promote e-commerce to increase trade facilitation, enhance investment in information and communication infrastructure, improve telecommunication infrastructure, and ensure quality of communication, and enhance insurance of information safety and security.
- It is essential for Vietnam to enhance improvement of institutional environment, customs environment, and financial environment, increase investment in improving the efficiency of ports, improving the quality of road, railway and air infrastructure. Build infrastructure to connect with other countries in the ASEAN region to facilitate goods circulation. Vietnam needs to simplify its customs procedures, improve customs transparency, improve the legal environment and strengthen e-commerce development. Perfect the provisions of the law in order to promote trade to reduce trade barriers. It is essential to prioritize investment in e-commerce to promote trade facilitation faster. In addition, it is necessary for the nation to learn from the experiences of countries with trade facilitation development (such as Germany) to develop trade facilitation.

#### REFERENCES

- Wilson J S, Mann C L, Otsuki T. Trade Facilitation and Economic Development: A New Approach to Measuring the Impact [J]. World Bank Economic Review 2003, 17(3): 367-389.
- [2] T. Hertel, T. Mirza. 2009. "The Role of Trade Facilitation in South Asian Economic Integration". Study on Intraregional Trade and Investment in South Asia. ADB.
- [3] Foreign Economic Journal Foreign Trade University. Facilitating trade and logistics policy harmonization in ASEAN countries, Foreign Trade University-Foreign Trade magazine, No. 63 (03/2014)
- [4] Trinh Thi Thu Huong, Phan Thi Thu Hien. WTO Trade Facilitation Agreement Opportunities and Challenges for Vietnam, Foreign Economic Journal — Foreign Trade University, No. 71(03/2015)
- [5] H. Nordås, R. Piermartini. "Infrastructure and trade". WTO Staff Working Paper ERSD, 2004.
- [6] J. Felipe, U. Kumar, "The Role of Trade Facilitation in Central Asia: A Gravity Model". The Levy Institute Working Paper, No. 628, 2010.
- [7] C.N.Kumar. "Prospects of Regional Economic Cooperation in South Asia". Woodhead Publishing Limited, 2012, 101-115.
- [8] APEC's Trade Facilitation Action Plan: AMid-TermAssessment [R]. 2004
- [9] Tinbergen J. Shaping the world economy: A suggestions for an international economic policy [M]. New Pork: The Twentieth Century Fund, 1962.
- [10] Poyhonen P.A tentative model for the volume of trade between countries [J]. Weltwirtschatlliches Archive, 1963, 90(1): 93100.



- [11] APEC. Assessing APEC Trade Liberalization and Facilitation: 1999 update[R].Economic Committee, Sigapore, 1999, 11.
- [12] Shepherd B, Wilson JS, Trade Facilitation in ASEAN Member Countries: Measuring progress and assessing priorities [J]. Social Science Electronic Publishing, 2009, 20 (4): 367-383.
- [13] Itakura, K. (2014). Impact of liberalization and improved connectivity and facilitation in ASEAN. Journal of Asian Economics, 35, 2–11.
- [14] APEC's Trade Facilitation Action Plan: AMid-TermAssessment[R]. 2004.
- [15] Zhang Yabin. Facilitating trade in countries in China's Silk Road belt and commercial potential. Chinese economic journal,2016(5):112-122.
- [16] Ran Qizhao, Yang Dan Ping. Research on the effects of trade facilitation of EU countries on Chinese trade. Technical and management journals, 2018(2): 33-40.
- [17] Gao Zhigang, Song Yadong. The impacts of trade facilitation in countries on China's Silk Road bet on China's economy. Guizhou Social Science Journal, 2018 (7): 100-108.