Analyzing the Determinants of Service Trade Flows Between Vietnam and the European Union: A Gravity Model Approach

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Abstract: This paper analyzes the determinants of service trade flows between Vietnam and the European Union. In this respect, a gravity model has been estimated with panel data and pooled, random and fixed effect estimation, covering the period of ten years from 2002 to 2011, for total service trade flows, service exports, and service imports between Vietnam and the European Union separately. The estimated results indicate that the service trade flows between Vietnam and its European partner countries are determined by the GDP per capita gap between Vietnam and EU countries, the population of EU countries, the real effective exchange rates, colonial relationship and being former members of the Council of Mutual Economic Assistance.

Keywords: Gravity model, service trade, Vietnam, EU.

1. Introduction

In Vietnam, the service industry has played an important role in the socio-economic development of the country, and has contributed significantly to its economic growth. Since 2005, the growth of Vietnam's service sector has exceeded total GDP growth. In 2013, the service sector of Vietnam grew by 6.57%, accounting for 43.9% of the country's GDP, and created employment for 16.7 million persons [1]. From the perspective of the government of Vietnam, the service industry is a vital part of Vietnam's strategy to become a modern economy by 2020. Therefore, the service sector is targeted to grow by 8-8.5% per year and account for 42-43% of Vietnam's GDP during 2016-2020[1]. The

Vietnamese government has also implemented comprehensive policies to accelerate the development of high-value-added services.

In Vietnam, trade in services has accounted for less than 10% of total trade, although the service sector has accounted for the largest share in GDP. The value of services trade has more than doubled since 2007 but its share in total trade has decreased quite significantly because trade in goods has grown faster than trade in services during that time. Among Vietnam's trade partners, the European Union (EU) has been recognized to be one of the most important markets over time. In terms of trade in goods, the EU has been the biggest importer of Vietnamese products since 2012, with an import value of nearly USD 24.5 billion. The EU is also the fifth biggest exporter to Vietnam with an export value of around USD 9.5 billion in 2013 [2, 3]. However, the EU's

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[1] Decision No. 175/QD-TTg dated January 27, 2011 on Approving Vietnam's Overall Service Sector Development Strategy by 2020.

trade in services with Vietnam has been relatively small compared to its trade in goods with Vietnam. This raises the question as to whether service trade between the EU and Vietnam in the near future can be potentially much higher than the present level, and what would be the determinants of this potential change.

The objectives of this paper are two fold. Firstly, it aims at providing an overview picture of trade in services between Vietnam and the EU. Secondly, it attempts to analyze the determinants of that service trade flow using the gravity model approach. The paper is structured as follows. After the introduction, Section 2 provides a picture of Vietnam - EU trade in services. Section 3 presents the gravity model approach used in this paper and reviews the existing literature on gravity model applications to services. In section 4, the gravity model is used to estimate the services trade between Vietnam and the EU and then the results and findings are discussed. Section 5 is the conclusion part.

2. An overall view of Vietnam - EU trade in services

Over the period 2006-2012, the bilateral trade flows of services between Vietnam and EU have more than doubled from over USD 1,773 million in 2006 up to USD 3,650 million in 2012 (Figure 1).

In this period the EU's service trade in total service trade with Vietnam was quite stable and relatively large, around 17-21%, except for the year 2009 when the share went up to over 25%. This is because there was a significant decrease in the total trade in Vietnam's services in 2009 due to the global economic downturn while the Vietnam-EU service trade flows still increased, despite the crisis.

Although Vietnam hada deficit in service trade with the world consistently in 2006-2012, it enjoyed a surplus in service trade with the EU in several years - about USD 420 million in 2006, over USD 190 million in 2008, nearly USD 280 million in 2011 and above USD 140 million in 2012 (Figure 2).

Figure 1: Bilateral service trade between Vietnam and the EU, 2006-2012.
(Unit: million USD)
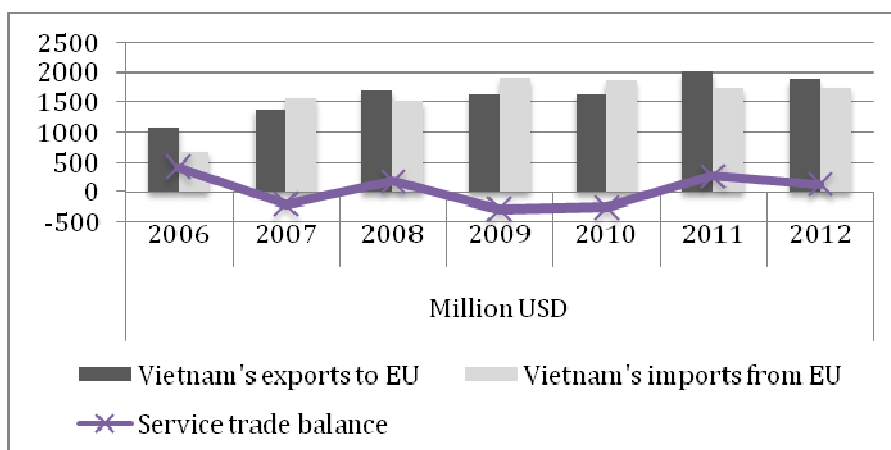*Source:* EBOPS 2002 - OECD Database (2014) and Trade Map Database (2014)

Figure 2: Vietnam's service trade balance with the EU, 2006-2012
(Unit: million USD)
Source: EBOPS 2002 - OECD Database (2014).

Most of the growth in bilateral service trade between Vietnam and the EU can be attributed to the increase in service trade between Vietnam and France, the United Kingdom, the Netherlands, Denmark and Germany (Figure 3). These five countries accounted for over 65% of the total Vietnam - EU service trade flows in 2006 and nearly 62% in 2012. Among these five countries, France was the largest service trade partner with Vietnam, with the bilateral trade being USD 415 million in 2006 and USD 913 million in 2012, accounting for more than 23% and 26% of the total Vietnam - EU service trade, respectively. The respective numbers for the United Kingdom, the second largest partner, were USD 218 million and USD 442 million in 2012[2].
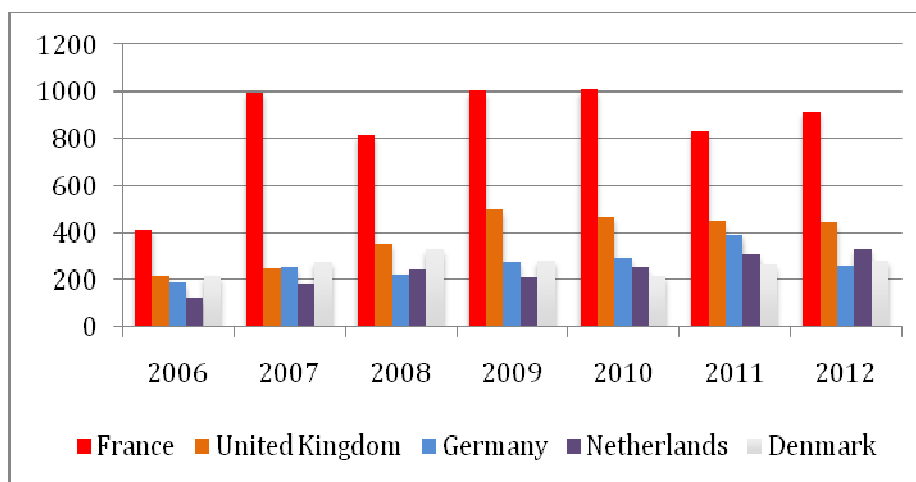

Figure 3: Top 5 EU countries in trade in services with Vietnam, 2006-2012
(Unit: million USD)
Source: EBOPS 2002 - OECD Database (2014).

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[2] Data on Vietnam's service imports from Germany is available while data on Vietnam's service exports to Germany is not. Therefore, in reality, the rank of Germany in the top 5 might be higher.

3. The gravity model and its application for trade in services

3.1. The gravity model

The gravity model was firstly applied to examine international trade flows by Tinbergen [4]. Since then, it has become a useful tool in international trade literature, especially with a renewed interest among economists in geography and the impacts of distance on international trade. There are several theoretical foundations for the gravity equation ranging from that of Anderson [5] to Bergstrand [6], both of whom modeled the value of bilateral trade flows as a function of income and transport costs.

Subsequently, it has been widely recognized that the gravity equation can be derived from different models, including the Ricardian model, Heckscher-Ohlin theory, and the monopolistic competition model. Specifically, Helpman and Krugman [7] showed that the gravity equation can be derived from the monopolistic competition model with increasing returns to scale, whereas Deardorff [8] indicated that it can also be derived from the Heckscher-Ohlin model without assuming product differentiation. Eaton and Kortum [9] derived a gravity-type equation from the Ricardian type of model, and Helpman et al. [10] and Chaney [11] obtained it from a theoretical model of international trade in differentiated goods with firm heterogeneity.

In its general formulation, the gravity equation has the following multiplicative form:

$$X_{ij} = GS_i M_j e_{ij}$$

Where X_{ij} is the monetary value of exports from Nation i to Nation j, M_j denotes all importer-specific factors that make up the total importer's demand (such as the importing country's GDP) and S_i comprises exporter-specific factors (such as the exporter's GDP) that represent the total amount exporters are willing to supply. G is a variable that does not depend on i or j such as the level of world liberalization. Finally, e_{ij} represents the ease of exporter i to access the market j (that is, the inverse of bilateral trade costs)[3].

3.2. Application of the gravity model for trade in services

Over the last 40 years, there have been a lot of studies using the gravity model to investigate trade flows. However, most studies have paid more attention to using the gravity model for trade flows of goods rather than flows of services.

Can the gravity model be used to study service trade? Arguably, the gravity model would appeal more to service trade than goods trade as the physical proximity between producers and consumers is very important for certain types of service trade. Secondly, service products are often differentiated by quality and location, which may give rise to monopolistic competition. Thirdly, the market for services is often characterized by asymmetric information where reputation and signaling play a central role. In a gravity model setting, if trade costs increase with distance, the elasticity of exports with respect to distance will be higher in sectors such as services where fixed market investments are important.

The existing literature on the application of the gravity model to services trade is so far quite limited. One of the first papers on the subject was that of Francois [12], who models the demand for imports of services as a function of the recipient country's GDP per

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[3] See Bacchetta, M., C. Beverelli, O. Cadot, M. Fugazza, J. M. Grether, M. Helble, A. Nicita, and R. Piermartini, "Chapter 3: Analyzing Bilateral Trade using the Gravity Equation", in *A Practical Guide to Trade Policy Analysis,* United Nations and World Trade Organization for more information, 2012.

capita and population based on data taken from the Global Trade Analysis Project (GTAP) database. In an extension of this approach, Park [13] also uses service data from the GTAP to calculate tariff equivalence for a larger selection of countries and sectors. The gravity model is modified to include price indices to capture differences in prices between countries. With the publication of the OECD database, Grunfeld and Moxnes [14], Kimura and Lee [15], Lejour and Verheijden [16], Mirza and Nicoletti [17], Kox and Lejour [18], Lennon [19] and Walsh [20], have all used this dataset to assess determinants of bilateral services trade using the gravity framework.

Grunfeld and Moxnes [14] apply a gravity model to the bilateral export of services and FDI flows using data from the OECD. Their regression includes the level of GDP and GDP per capita in the importing and exporting countries, the distance between them, a dummy variable if they are both members of a free trade area (FTA), a measure of corruption in the importing country, and a trade restrictiveness index (TRI[4]) to measure the barriers to services trade in the importing country. Their results suggest that the standard gravity model effects found in studies on trade in goods can be applied to service trade too. Service trade between two countries is positively related to their size and negatively related to the distance between them and to barriers to services in place in the importing country.

Kimura and Lee [15] use a mix of OLS and fixed effects for time to compare trade in goods with that in services in a gravity model setting. As with Grunfeld and Moxnes [14], they use the OECD statistics on trade in services. They add someof the standard gravity model variables, including adjacency and language

dummies, and additionally include a measure of remoteness as a regressor. They find that distance between trading partners is more important in service trade than in goods trade and suggest that this implies higher transport costs for services, but fail to provide any reason why this may be the case.

Lejour and Verheijden [16] also compare the gravity model estimate for trade in goods and services, examining intra-regional trade in Canada and the EU using the OECD services trade statistics and data from the official Canadian statistical agency. Unlike Kimura and Lee [15], distance is found to be less important for services compared to goods. Lennon [19] compares trade in goods and services with a focus on the commercial services sector of the OECD database and finds distance and adjacency to be less significant for trade in services than in goods, and common language and RTAs to be more important for services trade. The impact of the latter, however, is found to be insignificant with GDP per capita included in the estimation.

Walsh [20] uses the Hausman-Taylor method (HTM) to estimate a gravity model for services trade and finds the wealth of countries and a common language to be the most important determinants of services trade. The impact of distance is generally found to be insignificant. A measure of services restrictiveness based on the TRI is also found to be weakly significant.

As can be seen, there is a general lack of consensus on the key findings in the literature analyzing the determinants of services trade using gravity-based approaches. For instance, Kimura and Lee [15] find distance to be more important for services trade while Lejour and Verheijden [16] and Lennon [19] report the converse to be true. Walsh [20], on the other hand, finds the impact of distance to be

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[4] The TRI is the augmented frequency index based on research by the Australian Productivity Commission.

insignificant. However, what is more important is that the previous literature has laid out the foundation for application of the gravity model to service trade that will be applied in this paper to construct a gravity model for Vietnam in service trade with the EU.

3.3. Application of gravity model for trade in Vietnam

In Vietnam, there are also several studies using the gravity model to analyze international trade flows as well as the bilateral trade flows of Vietnam. Do Tri Thai [21] applies the gravity model in order to explain bilateral trade flows between Vietnam and 23 European countries from 1993 to 2004. His regression includes GDP and population of exporting and importing countries, real exchange rate and distance between them and a history dummy variable. He finds that the determinants of bilateral trade between Vietnam and the European countries are economic size (GDP), market size (population) and the real exchange rate volatility. However, distance and history seem to have no effect.

Nguyen Xuan Bac [22] also uses the gravity model to analyze the exporting flows of Vietnam with the dependent variable being the exporting value from Vietnam to other countries during the 20 year period up to 2006. After regressing both static and dynamic models, he find that there is a strong correlation between the Vietnamese contemporary export flows and those of the previous year, and that the value of export from Vietnam to other countries has a positive relationship with GDP, exchange rate and the partner being in ASEAN, and is negative with distance.

Dinh Thi Thanh Binh, Nguyen Viet Duong and Hoang Manh Cuong [23] use the gravity model to analyze bilateral trade activities between Vietnam and 60 countries in the period from 2000 to 2010 with the database of the ITC, the IMF and the WB. Their results suggest that the bilateral trade flows between Vietnam and 60 countries were strongly affected by the economic size of Vietnam, the economic size and market sizes of partners, distance and culture.

However, it is worth noting that studies using a gravity - based approach in Vietnam so far have only focused on trade in goods. There is a lack of studies applyingthe gravity model to analyze trade flows in services of Vietnam. Therefore, the aim of this paper is to usethe gravity model to analyze the service trade of Vietnam and to specifically examine the determinants of the services trade of Vietnam with the EU.

4. Data analysis and findings

4.1. Estimation model and data source

The gravity model used for estimation in this paper is presented in equation (1), in which all continuous variables are expressed in logarithms.

$\ln T_{ijt} = a_{ij} + a_1 \ln GDPPCGAP_{ijt} + a_2 \ln POP_{it} + a_3 \ln POP_{jt} + a_4 \ln DISTANCE_{ij} + a_5 \ln REER_{ijt} + a_6 CONOLY_{ij} + a_7 CMEA_j + e_{ijt}$

Equation (1) issued to estimate total services trade (exports plus imports), service exports and service imports separately. Therefore, the dependent variable *lnT$_{ijt}$* is the logarithm of total services trade, services exports and services imports between Vietnam and EU partner country *j* at time *t*.

The first continuous variable is the difference between the GDP per capita of Vietnam and the GDP per capita of the EU partner country *j* at time *t*, *GDPPCGAPijt*. The GDP per capita gap is created by taking the GDP per capita of the EU partner country and subtracting the GDP per capita of Vietnam.

Since the GDP per capita of the EU partner countries is much higher than that of Vietnam, GDP per capita gaps always take the positive sign and thus logarithms can be taken. The coefficient of the GDP per capita gap is expected to take either a positive or negative sign because the impact of the GDP per capita gap on total services trade is not straightforward in the literature.

The coefficients on the population of Vietnam and EU countries at time t, POP_{it} and POP_{jt} respectively, are expected to take either a negative or positive sign. As Zarzosa and Lehmann (2002) show, population size may have a negative effect on export if countries export less as they become larger and rely more on internal trade, or a positive effect if they export more as they become larger and are able to achieve economies of scale. Population size similarly is expected to have either a positive or negative sign on imports.

Distance, $DISTANCE_{ij}$, is involved as a proxy for trade cost between Vietnam and EU partner countries and is expressed as weighted distance taken from CEPII. Although distance between the two countries is typically expected to have a negative impact on trade in goods, it is not clear from a review of the existing literature about the impact of distance on trade in services. Service products do not have to be physically transported from location to location. Depending on the nature of each mode[5] of service trade, the sign of distance might be positive or negative.

The last continuous variable is the real effective exchange rate ($lnREER_{ijt}$) between Vietnam and EU partner countries at time t. The

coefficient of real effective exchange rate is expected to have either a positive or negative sign, depending on the mode of service trade.

The final two regressors are dummy variables indicating whether Vietnam and EU partner countries have ever had a colonial link ($COLONY_{ij}$) and whether the EU partner country was a former member of the Council of Mutual Economic Assistance ($CMEA_j$). Colonization is used to describe a relationship between two countries, independently of their level of development, in which one has governed the other over a long period of time and contributed to the current state of its institutions. The effect of colonial link between Vietnam and a partner country is expected to be positive since having a colonial relationship may promote the trade flows between the two countries. The last dummy variable is also expected to have a positive sign, since being members of the same association would support and promote the economic and trade relationship between Vietnam and those partner countries, not only in the past but also at present. The dummy variable for $COLONY_{ij}$ is equal to unity if Vietnam and the EU partner country j were once in a colonial relationship, and the $CMEA_j$ dummy variable is equal to unity if the partner country was a former member of the CMEA.

A panel framework is designed to cover service trade variation between Vietnam and its European trading partners during a period of ten years from 2002-2011. Panel estimation in this paper is done by using pooled OLS estimation, fixed effect (FEM) and random effect (REM). The paper conducts the Breusch-Pagan test, which is applied to REM, comparing it to the

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[5] Service trade is conducted through four Modes of supply. Mode 1: Cross-border supply; Mode 2: Consumption abroad; Mode 3: Commercial presence; and Mode 4: Presence of Natural Person.

pooled OLS estimator. The result of the Breusch-Pagan test indicates that REM is a better estimator than OLS. The Hausman test is also applied to REM and FEM, showing that REM is better than FEM.

Concerning the data source, data on Vietnam's imports and exports of services with each of 27 EU partners are extracted from the OECD database on international trade in services. Data on GDP per capita (in current USD) and population variables are drawn from the World Development Indicators database. The distance used in this paper is weighted distance taken from CEPII's database on distance. This distance is calculated between two countries based on bilateral distance between the biggest cities of those two countries, those inter-city distances being weighted by the share of the city in the country's overall population. The data on the real effective exchange rate index (2005 = 100) of Vietnam and EU partner countries are taken from the World Development Indicators Data and

collected for the period of 10 years from 2002 to 2011 with 270 observations in the dataset.

The summary statistics for each of the variables is shown in Table 1.

4.2. Results and findings

Since the test results reveal that REM is the best estimator, this section focuses only on REM estimation. The estimation results of equation (1) for total service trade (exports plus imports) between Vietnam and EU are given in Table 2.

As shown in Table 2, when the gravity model is estimated using REM for total services trade (Column 3), all variables except distance and population of Vietnam are 1% statistically significant and their coefficients take the signs that would be expected from the standard gravity literature. The model fits data relatively well with R^2 at 57.8%, which means that the dependent variables explain nearly 60% of the observed variations in total service trade between Vietnam and EU.

Table 1: Summary statistics

Variable	Mean	Std. Dev.	Min	Max
IMPORTijt	39360.3	81633.25	1	524200
EXPORTijt	32436.46	97675.43	1	750670
TRADEijt	71796.29	162561.5	1	1046770
GDPPCGAPijt	27.24949	19.43542	1.55368	110.864
POPit	8.37E+07	2650941	7.95E+07	8.78E+07
POPjt	1.84E+07	2.28E+07	395969	8.25E+07
DISTANCEij	9061.271	812.1724	7629.566	11140.04
COLONYij	0.037037	0.1892033	0	1
REERijt	0.9072721	0.1203427	0.6967219	1.502877
CMEAj	0.2592593	0.4390419	0	1

Source: Calculation of the authors from the dataset.

Table 2: Estimated results for total Vietnam - EU service trade equation

	(1)	(2)	(3)
	Pooled OLS	Fixed effect	Random effect
Dep. var		LnTRADE	
LnPOPit	1.430	23.259	4.971
	(7.989)	(14.497)	(9.645)
LnPOPjt	0.812***	0.240**	**0.514*****
	(0.162)	(0.112)	(0.149)
LnGDPPCGAP	4.873***	1.742	**3.905*****
	(0.317)	(1.598)	(0.592)
LnREER	4.435***	5.353*	**7.604*****
	(1.704)	(2.959)	(2.339)
LnDISTANCE	-8.199**		-3.477
	(3.449)		(9.291)
COLONY	4.389***		**4.901*****
	(0.580)		(0.862)
CMEA	3.901***		**3.716*****
	(0.595)		(1.313)
_cons	26.650	-426.425	-72.940
	(153.584)	(261.058)	(204.088)
Observations	270	270	270
R^2	0.591	0.245	0.578

Robust standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.

Source: Calculation of the authors from the dataset.

Firstly, the population of EU countries rather than that of Vietnam is found to have a high significance and a positive influence on total service trade. An increase of 1% in the population of EU nations tends to enhance Vietnam - EU service trade flows by approximately 0.5%. The positive relationship between the population of EU countries and service trade flows indicates that EU countries trade more with Vietnam in services when its market size becomes larger. It is, however, worth noting that population of Vietnam does not have an influence on service tradestatistically. This might be explained by the fact that EU consumers have a relatively high proportionate demand for services while the consumption pattern of Vietnamese consumers is more proportionate to daily consumption such as eating, drinking and smoking[6]. Therefore, the increase in the

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[6] Based on Vietnam Household Living Standards, surveyed annually.

population of Vietnam is not the vital reason for an increase in the EU's service exports to Vietnam, while the reverse holds true. In addition, it might imply that the EU trades in services with Vietnam because of the differences in service quality and comparative advantages rather than market size.

Secondly, the coefficient of the GDP per capita gap is 1% statistically significant and has a positive sign. Specifically, if the GDP gap increases by 1%, the bilateral service trade flows will go up by roughly 4%. This implies that the larger the difference in GDP per capita between Vietnam and partner countries is, the bigger the volume of services Vietnam trades with these nations. In other words, Vietnam tends to trade more with countries that have high income per capita. This finding is opposite to the Linder hypothesis[7],but absolutely consistent with Lee et al. [24] who state that countries with a similar level of income per capita trade less with each other, or an increase in GDP per capita gap will increase the bilateral service trade flows. This is because if both countries have comparable services, then the net gains from service trade may be negligible, and domestic service is likely to replace service trade.This effect depresses the service trade between similar countries.

Thirdly, the real effective exchange rate is found to have a strong and positive impact on total service trade. An increase of 1% in the real effective exchange rate will boost the value of service trade between Vietnam and the EU by about 7.6%. This might be explained by the fact that like most of the other nations in the world, service trade through establishing commercial

presence (Mode 3) and consumption abroad[8] (Mode 2) is the most prevailing in Vietnam. Therefore, if the real effective exchange rate increases, it will encourage foreign service enterprises to set up a commercial presence in Vietnam to provide services or foreign tourists to travel to Vietnam. In fact, tourism has been among the biggest exporting service sectors of Vietnam.

Fourthly, distance is another explanatory variable that is statistically insignificant. This finding is not surprising and in line with the suggestion of Walsh (2006). Unlike trade in goods that requires physical movement of goods across borders, trade in services does not necessarily require services to be physically transferred across nations. Depending on the nature of the service, in some cases service trade will require movement of a physical person but in others services may be provided electronically.

Fifthly, the coefficient of colony is 1% statistically significant with a positive sign. The positive coefficient indicates that the service trade flows between Vietnam and EU nations is strongly supported by the colonial link. Amongst reported EU partner countries, France is the only country that once had a colonial link with Vietnam. Therefore, it is not surprising that France has been the largest services trade partner of Vietnam for years.

The last variable, CMEA, also has the expected sign and statistical significance. The positive coefficient of CMEA implies that being a former member of CMEA will positively influence the service trade flows between these countries and Vietnam.

In an attempt to further the interpretation, equation (1) is used to estimate the service exports and service imports of Vietnam with EU partners. The estimation results using the REM model are given in Table 3.

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[7] The Linder hypothesis originates from the premise that countries with similar capital incomes tend to trade more with each other in manufacturing goods. Lee et al. (2012) conclude that the Linder hypothesis does not hold for service trade.

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[8] That is foreign tourists travel to Vietnam.

Table 3: Estimated results on services exports and services imports

Dep. Var	(1) LnTRADE	(2) LnEXPORT	(3) LnIMPORT
LnPOPit	4.971	12.456	-1.361
	(9.645)	(10.369)	(9.152)
LnPOPjt	0.514***	**0.220***	**0.470***
	(0.149)	(0.132)	(0.176)
LnGDPPCGAP	3.905***	**2.285***	**3.844***
	(0.592)	(0.806)	(0.658)
LnREER	7.604***	**5.129**	**7.625***
	(2.339)	(2.371)	(2.172)
LnDISTANCE	-3.477	0.029	-2.660
	(9.291)	(9.235)	(8.826)
COLONY	4.901***	**6.017***	**4.957***
	(0.862)	(0.997)	(1.089)
CMEA	3.716***	1.036	**4.173***
	(1.313)	(2.319)	(1.359)
_cons	-72.940	-232.449	35.025
	(204.088)	(211.990)	(206.817)
Observations	270	270	270
R^2	0.578	0.374	0.569

Robust standard errors in parentheses.

* significant at 10%; ** significant at 5%; *** significant at 1%.
Ln(EXPORT): Service Exports of Vietnam to EU.
Ln(IMPORT): Service Imports of Vietnam from EU.

Source: Calculation of the authors from the dataset.

The estimated coefficients for Vietnam - EU service exports are shown in Column 2 and service imports in Column 3. As can be seen, the estimated results for service exports and service imports are quite consistent with those for total service trade, and the service imports fits the data better than do services exports.

Population of Vietnam and distance are the only two variables that also do not have impact on both service exports and service imports,

while CMEA is found to have no impact on service exports.Population of EU member countries, the GDP per capita gap and real effective exchange rate are found to have greater impacts on service imports than service exports, whereas the opposite is true for colonial link.

The difference in GDP per capita has greater impact on Vietnam's service imports than service exports, which implies that a 1% increase in the

GDP gap makes Vietnam import more from than export to the EU. Therefore, an implication is that if Vietnam follows a mercantilist approach, Vietnam should promote trade more with EU countries that have a lower GDP.

In addition, it is worth noting that real effective exchange rate has a positive influence on both service export and service import. This finding is quite interesting, but it is consistent with Vietnam's service trade pattern, by which Vietnam mostly exports travel services through Mode 2 and imports commercial services, transportation services and insurance services through Mode 3. In fact, an increase in the exchange rate will encourage investors to invest more in Vietnam and foreign tourists to travel to Vietnam. In addition, the results also point out the real effective exchange rate has greater impact on Vietnam's service imports than service exports.

5. Concluding remarks

In the period 2001-2012, the Vietnam - EU service trade flow increased dramatically with a relatively stable and large proportion of around 17-21% of the total service trade of Vietnam. In addition, Vietnam had a trade surplus in services with the EU in several years in the context of service deficits with the whole world. This shows that besides the importance of the EU in trade in goods, the EU also plays an increasingly vital role in Vietnam's service trade. Therefore, it is a necessity for Vietnam to promote trade in services with the EU which is regarded as being among the best-quality service providers globally in order to support Vietnam's on-gong process of economic re-structuring.

In this paper, a gravity model has been employed with panel data and pooled, random,

fixed effect estimation covering the period of ten years from 2002 to 2011 for total service trade, service exports and service import separately. The estimated results on the Vietnam - EU overall service trade, service imports and service imports all indicate that bilateral service trade flows between Vietnam and EU are determined by the GDP per capita gap, the population of EU countries, the real effective exchange rate, colonial relationship and being former members of CMEA. Vietnam's population and distances between Vietnam and the EU nations are statistically insignificant.

The results imply that Vietnam can promote service trade with the EU based on taking advantage of the EU's market size, the GDP gap between Vietnam and EU nations, and differences in service quality, comparative advantage, and trade pattern. For instance, Vietnam can focus on exporting the service sector that has been considered to have relatively comparative advantage such as tourism and at the same time importing the high-quality services of the EU such as transportation, distribution and financial services. By doing this, customers will most benefit with a wider range of service selection. Service enterprises in Vietnam also have big incentives to renovate and increase competitiveness to compete with EU service providers. All of these changes will drive Vietnam towards a more modern economic structure in the future.

Service trade between Vietnam and EU also depends on exchange rate policy. The model shows that an increase in real exchange rate will encourage Vietnam's service imports more than service imports from the EU. Therefore, careful consideration of the exchange rate policy of both Vietnam and the EU to adopt an appropriate service trade strategy is of great

importance for Vietnam's service enterprises. The model results also implies that if Vietnam follows a mercantilist approach, Vietnam should also promote trade more with EU countries that have a lower GDP gap with Vietnam. Finally, to promote service trade with the EU, Vietnam can consider trading with France, the country that once had a colonial link with Vietnam, and with CMEA nations.

This paper in summary examines an overall picture of Vietnam's service trade with the EU and analyzes determinates of these service flows. This paper in the future can be upgraded by examining and analyzing determinants of the Vietnam-EU service trade or Vietnam's service trade in general by service sector and Mode, in order to provide a more comprehensive analysis and implications for Vietnam in trading in services with the world.

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[1] GSO, Employed population at 15 years of age and above as of annual 1 July by kinds of economic activity Statistical data. Hanoi, Vietnam: General Statistical Office of Vietnam, 2014a.

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