

An inquiry into the determinants of Vietnamese product export

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An inquiry into the determinants of Vietnamese product export

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ABSTRACT: Export led growth is the model of economic development that Vietnam has been following. While there are a great number of studies on the determinants of aggregate export of Vietnam, there are few that analyze the impacts of different factors on the export of different product groups. This paper aims at filling this gap in research on international trade of Vietnam. The results show that the fast GDP growth of Vietnam, the large population of importing countries, the wide economic gap between Vietnam and the importing countries, the depreciation of domestic currency, the free trade agreements that Vietnam signed and the shared border with the importing countries contribute to the increase of Vietnam's export of all product groups. In contrast, the GDP of importing countries and population of Vietnam have no clear impacts on the export of any product groups.

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1. Introduction

Export led growth model has been what Vietnam chose for developing economy during the past years, now and in upcoming time. This fact was reflected by the contribution of export in GDP is always greater than 60%. Thanks to rapid in development of export, Vietnam's economic growth rate during 2004 to 2007 was always great with the number above 8%. However, from the middle of 2008, the global economic crisis caused a sharp declining in Vietnam's export value, then impacting on economic growth, making it dropped to only 5.23% in 2009. Hence, the burning issue now is how to bust export to recover with high rate in the coming time. To do this, we need to understand clearly factors influencing on export value of Vietnam.

There were many researches on the field of export and factors impacting on it, however, most of these papers concentrated on Vietnam's total export value. These researches, therefore, can only give general results; and there was still little known of scrupulous impacts on the export value of different product groups of various factors. This paper aims at giving those effects in detail. In this paper, the product groups will be classified based on the Standard International Trade Classification (SITC) method of United Nation. And the research will use gravity model - which was applied widely for international trade analysis - for each group with the samples of 61 importing partner countries of Vietnam in the period of 5 years from 2004 to 2008. The purpose of this paper is to answer two main questions:

- What are the determinants of Vietnam's export value of different product groups?
- What are differences in directions of the impact that these determinant cause for export value in the case of each product group?

The paper will be arranged as follows. After the introduction is the literature review in Section 2. Section 3 will bring an overview of Vietnam's export value of

different groups and some hypotheses base on that. Section 4 will show the model applied to estimate and data collection. Section 5 will test the hypotheses and analyze the estimation result. From that, the governmental implications will be given in section 6. Finally, Section 7 will provide a sort conclusion of the paper.

2. Literature review

Gravity model is one of the most popular tools in economic analysis basing on gravity law in Physic science. At first, the model is criticized by many economists because of its lack of theory behind. Nevertheless, after that, there are many papers justified for theories explaining for that model and then reinforced the reasonableness of using it in economic studies. The initial model implies that trade between two countries has positive relation with their size and negative relation with distance between them as follows:

$$T_{ij} = AY_i^{\beta_1} Y_j^{\beta_2} DIS_{ij}^{\beta_3}$$

In which:

A: is trade-attractive/restrictive coefficient

T_{ij} : is traded value between country i and country j

Y_i ; Y_j : is size of the economies of country i and country j respectively

DIS_{ij} : is distance between two countries

Base on the model, determinants of trade flow were classified in three main groups: factors impacting on demand; factor impacting on supply and trade - attractive and trade – restrictive factors as revealed in the Figure 1

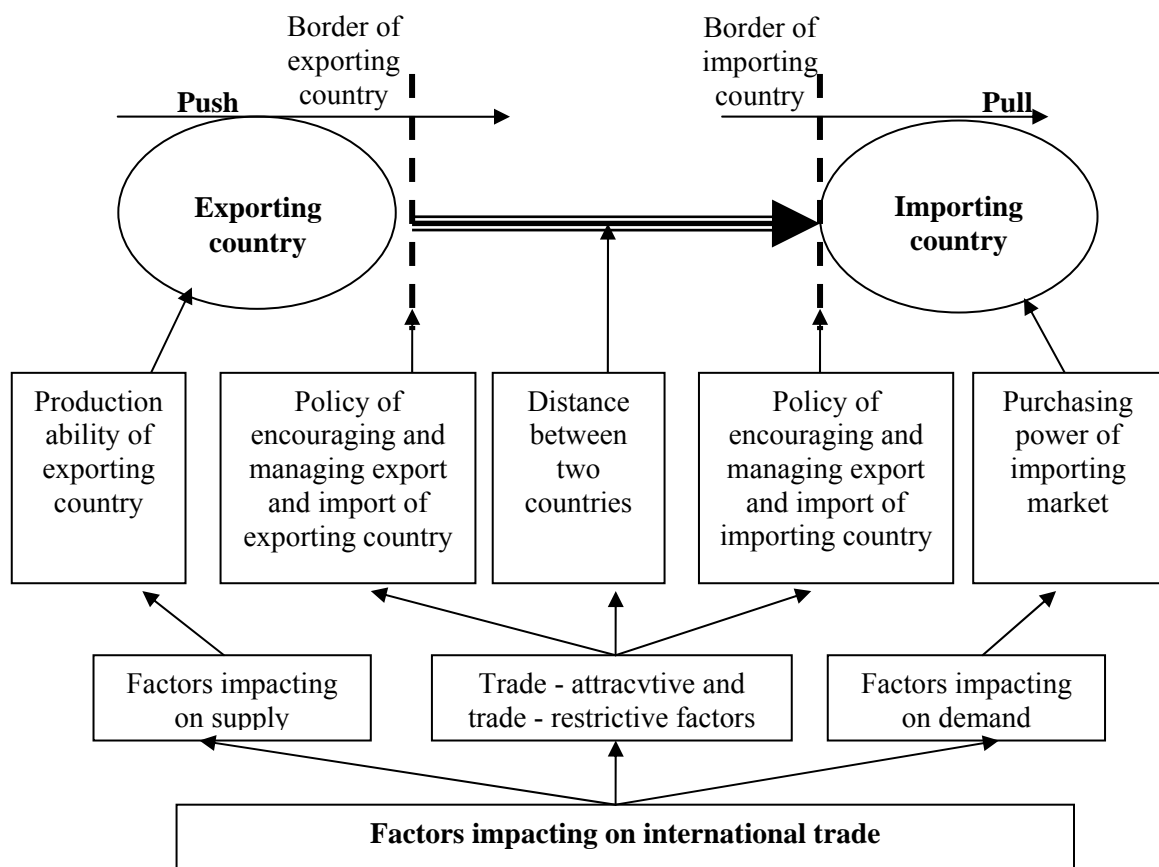


Figure 1: Gravity model in international trade

Source: Đào Ngọc Tiến (2008)

To represent for the group factors impacting on demand and supply in the Figure 1, income and population of a country usually are the most suitable candidates. They represent for size of all economies. In general, trade is expected to increase with size (attraction due to gravity), since large countries should trade more than small ones, and with per capita incomes, since rich countries should trade more than poor ones. Hence, the relationship of these variables and export seems to be positive. However, there are also negative impacts. Large population of exporting economy also leads to increase in domestic demand so it restricts export. Large size of importing country also means more supply of goods; thus it limits import from other countries. Therefore,

there are diverse directions of these impacts and the collective impact depends on the transgressing among these diverse directions.

In empirical studies, there are some opposite results for many country. The positive effects of GDP and population are found in Céline Carrere (2003) and H. Mikael Sandberg (2004), whereas the negative impacts of population in both importing and exporting country is found in Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003), Jacob A. Bikker (2009). For the case of Vietnam, all empirical studies such as Từ Thúy Anh and Đào Nguyễn Thắng (2008), Do Thai Tri (2006), and Đào Ngọc Tiến (2009) shows positive relationship of export with these factors. However, they only reflect the general size's impacts (simultaneous impact of GDP or population of importing and exporting country) but do not reveal the individual impact of each variable. As far as we found on this direction, there is only research of K. Doanh Nguyen and Yoon Heo (2009) for Vietnam and Singapore in ASEAN region; and it also give the positive impact. The paper, however, use total trade value instead export turnover, thus it cannot evaluate determinants of export value of Vietnam.

Beside that, different product groups have demand for and supply of varied. For this reason, the exports of them are expected to be influenced in contrast ways. In this study orient, there were research of H. Mikael Sandberg (2004) (for group of food products and group of manufactured products) and research of Nguyen Thanh Thuy and Jean-Louis Arcand (2009) (for trade flows of three group: homogeneous goods, reference price goods and heterogeneous goods). Both results of these papers show the impacts of income and population on the export value of necessary goods will less than that on the export value of others. In this field, there seem to be not any research for Vietnam's different product groups case.

Beside determinants impacting on demand for and supply of goods, trade-attractive and trade-restrictive variables are the second pillar of the gravity model. This term include many subgroups such as policies of encouraging and managing trade

(tariff, BTA² and FTA³, industrial policies...) and distance (geographical distance, economic distance, sociological distance...). Follows are more in detail of these subgroups.

The managing and encouraging trade policies of both importing and exporting countries directly affect on export value of all product groups. Those include some sub groups of policies such as exchange rate policy, the encouraging policy of developing domestic industries, free trade agreement... However, recently these variable have just been included in gravity model through the variables representing for exchange rate value, tax level or dummy variable representing for whether or not two country having common free trade agreement...

Most empirical studies agreed that depreciation of domestic currency will spur export of that country as in Do Thai Tri (2006), Nguyễn Thị Quy et.al. (2008), and Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003); the tax will have negative impact on export as in Đào Ngọc Tiến (2009). Mean while, the variable of trade agreement does not show a clear direction. In Céline Carrere (2003), the joining NAFTA, ASEAN, CACM causes negative influence but the joining in ASEAN (in Từ Thúy Anh and Đào Nguyễn Thắng (2008)) and the joining in MECORSUR (in Céline Carrere (2003)) give positive impacts on export value. However, there is a special point that all these studies do not considering the different impacts of these factor on different product groups. Thus, this paper will fulfill the task for the case of Vietnam's export.

As stated, the second sub-group of trade-attractive and trade-restrictive factors is distance. This includes geographical, economic and sociological distance. Distance affects trade by raising transportation costs and increasing the time involved, with associated concerns of perishability, adaptability to market conditions, irregularities in supply and interest costs.

² Bilateral trade agreement

³ Free Trade Area

All empirical studies are consensus at negative impacts of geographical distance on trade. Beside that, for the various characteristics of different groups, the level of influences of these sub factors on export value also varies. Nguyễn Thanh Thủy and Jean-Louis Arcand (2009) show the greater impact of this factor on traded value of homogenous groups than that of others.

For the distance in term of economic, it can cause both positive and negative impact on traded value of two countries depending on the dissimilar characteristics of particular case. It may cause positive impact in accordance with H - O theory as in Egger (2000), Di Mauro (2000), Freund (2000), Gilbert, Scollay and Bora (2001) or negative impact in accordance with new trade theory as in Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003). So the empirical studies also cannot confirm a particular direction of this factor's impacts.

Beside these distance, specific characteristic of a country as being an island, being land-locked or being remote (distant from all trading partners) also affect bilateral trade flows. These characteristics sometime are represented by the variable of sharing a common border and most empirical results show its positive impact on total traded value.

This section has shown different determinants of export value and the various empirical results in many situations; even they are contrast with each other. The summary of these results can be found in Annex A. The next sections will provide an overview of Vietnam's export and base on the reality, giving some hypotheses of effects of these above factors.

3. Overview of Vietnam's export of different product groups and hypotheses

3.1. Overview of Vietnam's export of different product groups

In period 2004-2008, Vietnam economy has developed quickly and so did the export value. In 2004, the export turnover of 26.5 billion USD at the growth rate of

31.5%. This is the highest rate since 1998. In 2005, the export value continues increase by 22.2% to USD 32 billion. This made an important contribution to the successful implementation of Export strategy 2001-2005.

Because the growth rate of export is much higher than the growth rate of GDP, the export make up 61% of GDP in 2005, a high percentage compared with the average number of the world.

To consider in more depth Vietnam's export value of different product, we classify export product into 2 main and 8 small sub groups in accordance with SITC classification of United Nation⁴:

Primary products include:

- SITC 0: Food and live animals
- SITC 1: Beverages and tobacco
- SITC 2: Crude materials, inedible, except fuels
- SITC 3: Mineral fuels, lubricants and related materials
- SITC 4: Animal and vegetable oils, fats and waxes

Manufactured products include:

- SITC 5: Chemicals and related products
- SITC 6: Manufactured goods classified chiefly by material
- SITC 7: Machinery and transport equipment
- SITC 8: Miscellaneous manufactured articles.

For group of primary products: from 2004 to 2008, Vietnam's export value of this group has augmented double. The proportion of this group to total export value reduced from 50.83% in 2004 to 49.7% in 2008. In more depth in considering this group, the growth of export value of SITC 3 stagnated while that of SITC 0 remains

⁴ From this till the end of the paper we will use this way of classification to evaluate the impact of different elements on export value of these above groups.

gradually constant speed during the period. The structure of sub-groups in primary products also had some changes with different directions as can be seen in the graph 3.1.1. Beside that, the export market structure of these products moved vigorously. Our export market is enlarged to some new markets beside main ones as USA, Japan, Australia, Singapore and China. The ratio of five listed countries to the total has decrease from 70% in 2004 to 63% in 2008.⁵

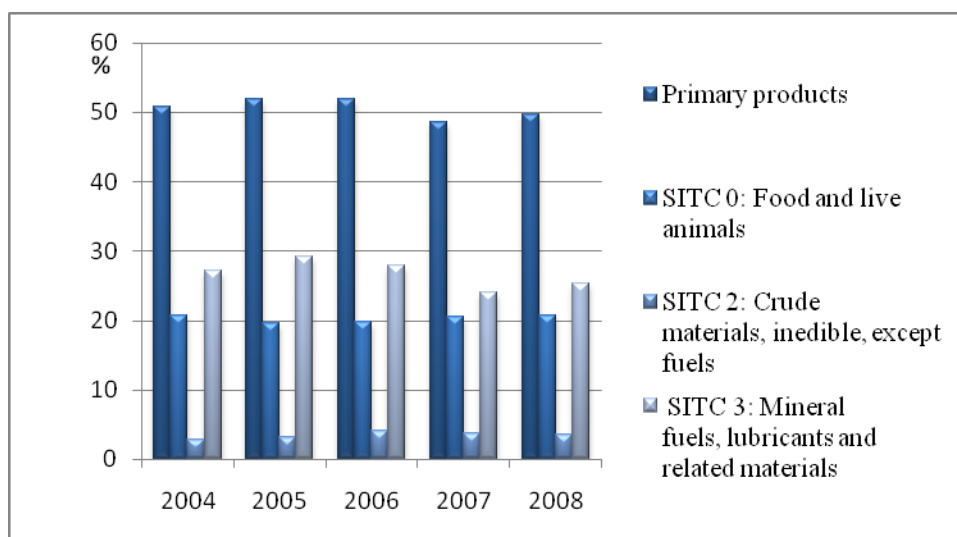


Figure 2: Proportion of main primary products exporting to 73 countries in total export from 2005 - 2008

Source: Constructed by authors basing on data collected from GCO (2010)

For group of manufacture products: the growth rate of export value of this group is steady and always at the rate of over 20%. The proportion of this group to total export turnover is also increase from 52.4% in 2004 to 55% in 2008. Inside this group, the goods making up high percentage is SITC 8: Miscellaneous manufactured articles, about over 40%, while SITC 7: Machinery and transport equipment only contributes fewer than 10% as can be seen in the graph 3.1.2. Beside that, export of this group concentrated in high income countries, especially United State with the proportion of more than 40% of Vietnam's total export value of manufactured goods.

⁵ ; ⁶ : calculated by authors basing on data collected from General Custom Office (GCO) of Vietnam

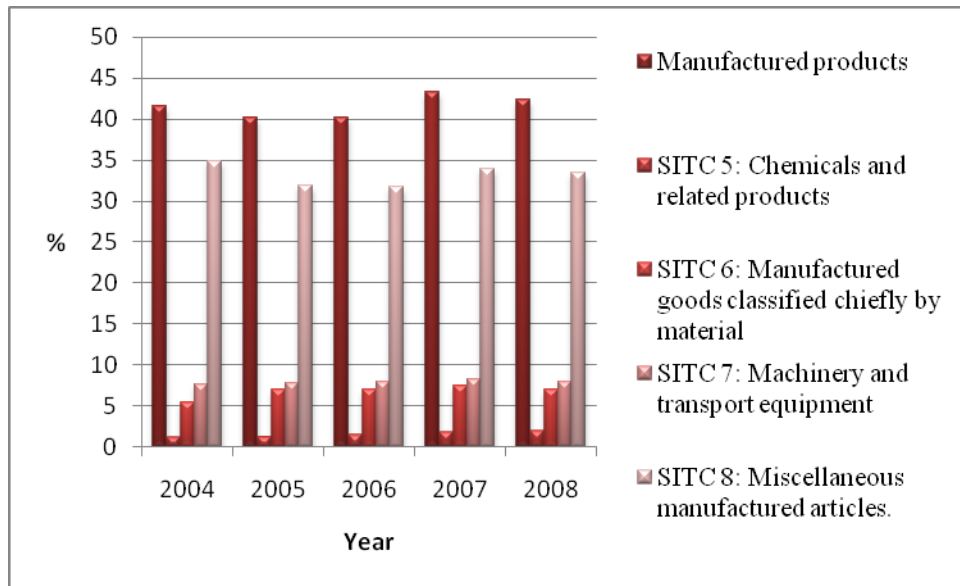


Figure 3: Proportion of main manufactured products exporting to 73 countries in total export from 2005 - 2008

Source: Constructed by authors basing on data collected from GCO (2010)

The above presented overview of Vietnam's export of different product groups. However, to have understanding for explaining impact of different factors on it, we need to know the variation of them. Thus, the following part will continue with overview of determinants and some hypothesis base on that.

3.2. Overview of different determinants and hypotheses

For the factors impact on demand for goods of Vietnam, we can have an overview as follows. In period from 2004 to 2008, the exporting markets of vietnam widened with many countries as stated above. With the common trend most of these countries's economies grow, however, with extremely different rate. This fact indicates the export of Vietnam does not concentrate in concrete level of GDP growth. Beside that, population of these countries also varies. The expansion rate of population is higher in the countries with low income but lower in the countries with high income

For the factors impact on supply of Vietnam for exporting, the first point is about GDP growth rate. In the period, Vietnam has high economic growth rate as well as possitive moving in economic structure toward industrialisation. The proportion of

agriculture in GDP decreased to only 17.57% in 2008 while that of industries and services increase to 41.6% and 40.83% respectively. This means that supply for primary goods raise in higher rate than manufactured goods. *Hence, we give the Hypothesis 1 of that GDP growth of Vietnam influences the manufactured products more vigorously than primary products.*

The second point in factor impacting supply of goods is population of exporting countries (population of Vietnam). In this period Population of Vietnam enlarges much (average rate is about more than 1.3%; the rate in 2004 is 1.47% then decreased to 1.2% in 2008); and this led to increase in labour supply. However, the low labour productivity which was not improved in period and the impact of more consumers due to this fact make small increase in supply of goods was canceled. There fore, we do not give any clear expectation of this factor.

For the case of the trade - attractive/ restrictive factors, the first element that we will mention here is bilateral trade agreement and free trade area that Vietnam joined. There are some changes of these elements during the period. In aspect of economic cooperation, Vietnam had signed some important bilateral trade agreement before and in this period those become effective such as Vietnam - United State Bilateral agreement having effectiveness from 2002 or joining ASEAN from 1995 with the AFTA completing in 2006. As many previous researches showed, after these signing, export of Vietnam surged remarkable. *Therefore, we give Hypothesis 2 of that Free trade agreements have different impacts on export of different product groups.*

In aspect of exchange rate policy, the exchange rate policy of Vietnam aims at the target of curbing inflation from 2004 to 2006, so the rate of exchange is stabilized and just rises slightly every year. Although this policy does not give our products highly comparative advantage, this stability still encouraged foreign trade activity. And from 2007 until now, after Vietnam is a membership of WTO, our exchange rate policy was more flexible and really supported export. Beside that, export performance in this period also change in positive direction with different rates. *Thus, we give*

Hypothesis 3: The increase in real exchange rate (depreciation of Vietnam Dong) has positive but different impacts on export of different product groups.

With regard to geographic distance which impact through transportation of good. In Vietnam, capacity of international transportation of goods from 2004 to 2008 is invested to improve; however, it is still inefficient showing in all indices of transportation quality. For example, quality of port infrastructure in Vietnam is only 3.28 in 2009, which is lower than the average of the world and even lower than those of low income countries (3.63 in 2009). This is the root for expecting clearly negative impact of this variable on export of all Vietnamese goods

For economic distance between Vietnam and importing partner countries, thank to reasonable policy in adjusting economic structure and liberalizing trade, Vietnam gained relatively high GDP growth rate. So we are diminishing the economic distance with other countries. Nevertheless, the quality of economic growth is not improved much. Hence, although the gap of income is narrowed, the level of economic development of Vietnam is still low in comparison with developed economies, chiefly in level of science and technology, level of labor force... Thus, Vietnamese production seems not the case of economies of scale while H - O theory seems the possible one. *From that we state Hypothesis 4: Economic distance has strong positive effects on export of different product groups.*

For the last factor of sharing a common border, it is not change during time, so we have the same expectation with many previous result about this element: the export turnover is affected positively by it.

4. Regression specification and data

From the theory and necessity of testing some hypotheses stated above, we construct the model as follow:

$$Ek_{Vjt} = A \times GDP_{jt}^{\beta_1} \times GDP_{Vt}^{\beta_2} \times POP_{jt}^{\beta_3} \times POP_{Vt}^{\beta_4} \times DIS_{Vj}^{\beta_5} \times EDIS_{Vjt}^{\beta_6} \times ER_{Vt}^{\beta_7} \times e^{\beta_8 \times BTA_FTA_{jt}} \times e^{\beta_9 \times BORDER_{jt}} \times e^{\frac{w_{Vjt}}{Vjt}} \quad (1)$$

In which:

- $E_{k_{Vjt}}$: is export value of group k from Vietnam to country j in year t
k receives value: 0; 2; 3; 5; 6; 7; 8 as SITC code, besides, k also receiver value of primary products (total sum of Vietnamese export value of SITC 0; 2; 3; 4) and manufactured products (total sum of Vietnamese export value of SITC 5; 6; 7; 8)
- A : Trade-attractive/ restrictive coefficient of trade flow between Vietnam and country j
- $GDP_{jt}; POP_{jt}$ ($GDP_{Vt}; POP_{Vt}$) : is Gross Domestic Product and population of country j (Vietnam) respectively in year t
- DIS_{Vj} : is geographical distance between Vietnam and country j
- $EDIS_{Vjt}$: is economic distance between Vietnam and country j (measured by different between GDP per capita of Vietnam and country j) in year t
- ER_{Vt} : is real exchange rate USD/VND in year t (is value of USD in VND)
- BTA_FTA_{jt} : is dummy variable, receives value 1 if country j and Vietnam have either Bilateral trade agreement or Free trade agreement before or in year t, receive value 0 in vice versa.
- $BORDER_{jt}$: is dummy variable, receives value 1 if country j and Vietnam share a common border in land, and receives value 0 in vice versa.
- $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8, \beta_9$: are coefficients of the above independent variables. Their value show level of impact of these variables on export value of different product groups in the models
- W_{Vjt} : is disturbance term

Then after taking natural log of model (1), we have model (2):

$$\ln Ek_{vj,t} = \beta_0 + \beta_1 \ln GDP_{jt} + \beta_2 \ln GDR_{vt} + \beta_3 \ln POP_{jt} + \beta_4 \ln POP_{vt} + \beta_5 \ln DIS_{vj} + \beta_6 \ln EDIS_{vj} + \beta_7 \ln ER_{vt} + \beta_8 \times BTA_FTA_{jt} + \beta_9 \times BORDER_{jt} + u_{vj,t} \quad (2)$$

However, there are some cases when the export value of some product groups of Vietnam to country j is 0; this means that they do not have natural log value and model (2) cannot be estimated. We solve this problem by add up 1 in the value of export of all product group. From that, we have the following model:

$$\ln (Ek_{vj,t} + 1) = \beta_0 + \beta_1 \ln GDP_{jt} + \beta_2 \ln GDR_{vt} + \beta_3 \ln POP_{jt} + \beta_4 \ln POP_{vt} + \beta_5 \ln DIS_{vj} + \beta_6 \ln EDIS_{vj} + \beta_7 \ln ER_{vt} + \beta_8 \times BTA_FTA_{jt} + \beta_9 \times BORDER_{jt} + u_{vj,t} \quad (3)$$

The adjustment of replacing $\ln Ek_{vj,t}$ in model (2) by $\ln (Ek_{vj,t} + 1)$ as can be seen in model (3) is relatively small in comparison with the export value of all product groups; therefore, the estimation results based on model (3) do not diverge much from those of model (2). Thus, we can consider the coefficients of model (3) are the coefficients of model (2).

The model is estimated with the data in the period from 2004 to 2008. The value of export of different product groups is generalized base on SITC classification with the data collected from Vietnam General Custom Office (here we only consider 7 groups of SITC classification; those are: SITC 0; 2; 3; 5; 6; 7; 8 and 2 bigger groups that are primary and manufactured product groups. The group SITC 1 and SITC 4 are excluded because of too small value of export of them. Data of GDP; GDP per capital in current USD, and population are collected from World data bank. The data of bilateral and free trade area is collected by different sources. The data of geographical distance is from Đào Ngọc Tiến (2010)⁶. The data of exchange rate value is collected

⁶ Đào Ngọc Tiến. (2010). "Điều chỉnh cơ cấu thị trường xuất khẩu hàng hóa của Việt Nam trong xu thế tự do hóa thương mại" (Adjusting exporting market structure of Vietnam in the tendency of trade liberalisation). PhD thesis in Economics, Foreign Trade University, Hanoi.

from website of Because of availability of data, there are only 61 Vietnam's importing partners in observing; hence, we have total 305 observations, a relative large number.

5. Regression analyses

Because the product export of Vietnam to many countries is only recorded as zero, we apply the Tobit estimation method to account for the censored data. We pool all of the data from 2004 to 2008 in all of the regressions.

The result shows that the coefficients of importing countries' GDP variable have the signs varied in the models for different product groups. In detail, if GDP of a country imported goods from Vietnam increase, then export value of SITC 0 (food and live animals), SITC 2 (crude materials, inedible, except fuels) and SITC 8 (miscellaneous manufactured articles) all decrease while the export value of the others increase. However, when we test the hypothesis of whether or not GDP of importing country impacts on export turnover of different product groups of Vietnam, there are very low absolute value of z , which indicate that this variable are not significant in all models. This can be explained by the opposite impact directions of GDP of importing country canceled each other. In summary, in the case of Vietnam, GDP of import partner do not effect on export value of all product groups.

For the variable of importing countries' population, as can be seen in the Figure 3, the coefficients of $\ln POP_j$ in all models are positive. In other words, the more population that importing country has the greater export value that Vietnam can export to that country. This indicates that the direction of positive impacts on Vietnamese export of population in import partner transgresses the direction of all negative impacts from increase in domestic production restricting import from other countries.

	SITC 0	SITC 2	SITC 3	SITC 5	SITC 6	SITC 7	SITC 8	Primary product group	Manufactured product group
C	4708.09 (1.14)	5794.77 (1.07)	10329.6 (1.03)	4997.76 (1.2)	4350.88 (1.09)	8835.1** (2.05)	4878.06 (1.19)	4488.14 (1.1)	5148.4 (1.26)
$\ln GDP_j$	-1.69 (-1.05)	-3.46 (-1.49)	6.67 (1.62)	1.67 (1.01)	2.34 (1.5)	3.11* (1.8)	-0.57 (-0.35)	-2.27 (-1.41)	-0.42 (-0.27)
$\ln GDR_j$	60.63* (1.77)	58.9 (1.32)	111.5 (1.36)	60.85* (1.76)	57.97* (1.75)	82.67** (2.31)	59.09* (1.73)	56.03* (1.64)	61.17* (1.79)
$\ln POP_j$	3.86** (2.34)	8.53*** (3.58)	0.2 (0.05)	1.53 (0.91)	0.37 (0.23)	0.45 (0.26)	2.93* (1.8)	4.6*** (2.8)	2.76* (1.7)
$\ln POR_j$	-379.98 (-1.32)	-435.24 (-1.15)	-799.06 (-1.15)	-397.24 (-1.37)	-357.32 (-1.29)	-646.74** (-2.15)	-385.78 (-1.35)	-357.56 (-1.25)	-404.51 (-1.41)
$\ln DIS_{vj}$	-5.83*** (-7.16)	-5.06*** (-4.65)	-9.45*** (-4.67)	-5.11*** (-6.16)	-5.01*** (-6.32)	-5.88*** (-6.8)	-5.03*** (-6.23)	-5.76*** (-7.12)	-5.08*** (-6.29)
$\ln EDIS_{vj}$	5.05*** (4.02)	6.91*** (3.79)	0.11 (0.03)	2.61** (2.05)	2.42** (2)	2.19* (1.63)	4.45*** (3.58)	5.54*** (4.42)	4.39*** (3.54)
$\ln ER_v$	74.53** (2.11)	64.31 (1.4)	143.08* (1.7)	72.75** (2.05)	72.2** (2.12)	89.9*** (2.45)	70.28** (2)	66.52* (1.89)	72.37** (2.06)
BTA_FTA_j	2.16 (1.39)	2.11 (1.04)	17.09*** (4.9)	4.28*** (2.74)	2.53* (1.68)	4.71*** (2.9)	1.76 (1.13)	2.67* (1.73)	2.06 (1.33)
$BORDER_j$	3.21 (1.45)	2.63 (0.88)	1.47 (0.3)	5.76*** (2.59)	6.41*** (3)	5.94*** (2.57)	5.27** (2.39)	3.53 (1.6)	5.73*** (2.6)
R ²	0.48909	0.45473	0.52486	0.51954	0.53729	0.56429	0.49462	0.5108	0.50253
Adjusted R ²	0.47172	0.43618	0.5087	0.5032	0.52156	0.54947	0.47743	0.49416	0.48561
Left censored obs	76	137	218	104	90	106	75	74	74
Observation	305	305	305	305	305	305	305	305	305

Figure 3: Estimation result (Tobit - ML - Censored Normal method)

Explanations:

*	: p value lower than 10%
**	: p value lower than 5%
***	: p value lower than 1%
()	: z statistic value
SITC 0	: Food and live animals
SITC 2	: Crude materials, inedible, except fuels
SITC 3	: Mineral fuels, lubricants and related materials
SITC 5	: Chemicals and related products, n.e.s
SITC 6	: Manufactured goods classified chiefly by material
SITC 7	: Machinery and transport equipment
SITC 8	: Miscellaneous manufactured articles

More over the forceful impact of population in importing country on export value happened for SITC 0 and SITC 2, we can give reason of necessity of foods and live animals in SITC 0 and the labor – intensity of production using these goods as raw material inputs. Because of that, the enlargement of population in importing country leads to increase sharply in supply of labor for widen production of labor – intensive product as well as demand for essential goods for life. Hence, it raises demand for this group rapidly. From that, this factor force importation of these groups from Vietnam. Beside that, when adding up all effects, the level of impacts of importing country's population on Vietnam's export value in primary product's case is greater and more significant than that the case of manufactured products. This result reaffirms the different effects of importing countries' population on Vietnam's export of different products.

The third factor in the estimated model is GDP of Vietnam. Firgure 3 shows that economic growth rate of Vietnam has positive force on export value of all product groups. The results confirm the preciseness of hypothesis 1 with the great value of coefficients of variable $\ln GDP_V$ and the low p value that are always smaller than 10% in the models of SITC 5; 6; 7; 8 and in the model for manufactured product group. This means that these coefficients are significant in explaining the growth of export value of the product group listed. In detail, from

the table we can see that in the condition of ceteris paribus, if the GDP of Vietnam increase by 1%, the export value of SITC 7 (- machinery and transport equipment – which is the group of products having high growth in export value) will go up by 82,67%.

Mean while, the export value of group SITC 3 (- mineral fuels, lubricants and related materials) is impacted little by GDP growth of Vietnam. This is showed in the very low value of z and high value of p and the smallest coefficient of variable $\ln GDP_t$ in the model for SITC 3. This fact can be explained by the changes in structure of Vietnamese economy with the higher contribution proportion of industry sector, especially manufacturing sector in GDP growth. This clarify for the fact that economic growth influences to export value of manufactured product groups with the higher level than to export value of primary product groups

For the variable of Vietnam's population, with the direction of impacts on domestic market, the raising in Vietnam's population forces the demand for goods then curbs supply of goods for exporting. The impacts in this direction transgress all positive impacts in the direction of increasing production due to expanding of labor supply. Therefore, negative sign of all this variable's coefficients in the models shows the limiting effects of Vietnam's population on export value of all groups. However, the result gives very high p value, which indicates that this factor is not significant in explaining variation of export value all product groups.

With regard to the variable of bilateral trade agreement and free trade area, this factor in the models for different product groups has coefficients varied in many directions. Nevertheless, that they are all positive shows the optimistic impact on Vietnam's export value of all product groups.

In more detail, this factor has little impacts on the export value of SITC 0 and SITC 2 because group SITC 0 relating much to agricultural production, which is the issue having less favorable condition in negotiation due to the food security. As a result, the impacts of free trade agreement on export value of these two

groups are fuzzy. The group of SITC 6 and SITC 8 also have coefficient not really significant. Normally, in free trade agreement, there is cutting in tariff for importing of these products, however, there are many non tariff measure is used after that. In addition, Vietnam's products usually meet many difficulties with the standards and regulations. For this reason, the impacts of free trade agreement on export value of these products are not clear.

In contrast, the export value of the product in SITC 3, SITC 5, and SITC 7 are influenced forcefully in positive trend by free trade agreement. This can be explained that there are not too many strict standard and regulation in non tariff measure applied for importing these products.

In general, the result found for the case of this factor matches with many previous researches showing that the effect of joining ASEAN of Vietnam on the export value of Vietnam to ASEAN member is not much. And the efficiency of AFTA is not really promoted in all directions. Summing up, Hypothesis 2 advanced above is not totally reasonable. To give supplementary for this hypothesis, the considering impact of free trade agreement on trade flow needs the inspecting the efficiency of implementing that agreement.

In consideration of exchange rate's influences, that the coefficients are positive and the p value of variable $\ln ER_t$ are mostly lower than 5% and 1% in all models as indicated in the Figure 3 reflects the affirmative impact of augmentation in real exchange rate (the depreciation of VND) on export of all product groups. The coefficient of real exchange rate variable (covered inflation) in the model proclaims that when the goods of Vietnam is relatively cheaper than that from other country, the export value of all Vietnam's product groups will be forced to increase powerfully.

Nonetheless, in the model for the group SITC 3 (-mineral fuels, lubricants and related materials), p value of variable $\ln ER_t$'s coefficient is greater than 10%; this means that the variable is not significant in explaining change in of

export value of group SITC 3. It can be explained that the products in group SITC 3 are essential in production of many industries, so the elasticity of demand for these products respect to price is not high. And as a consequence, the role of exchange rate is blurred in variation of export value of this group while it is very important in the case of other groups.

In the case of the models for generalizing all products into two main groups of primary and manufactured, the coefficient of $\ln ER_t$ are all significant and positive. More over, the impact is stronger in the case of manufactured product group than the case of primary product group. When the Vietnam dong is depreciated by 1% in real term (covered inflation), the export value of primary group increases only 66.52% while that of manufactured group increases by 72.37%. Similar to the above explanation, the fact is that because the elasticity of demand for manufactured products respect to price is relatively higher than that of primary products. For this reason, we can see the hypothesis 3 is rational, the depreciation of Vietnam dong makes export value of different groups of Vietnam increasing differently.

Regard to geographical distance, this determinant has negative impact on export value of all groups showing in the highest level of significant as well as the great absolute value of coefficients in the table. This result reflects that the farther distance from importing country to Vietnam, the more difficulty there is in export of Vietnam's products, then the lower the export value is. In contrast with many recent papers for other countries showing the fader role of geographical distance due to advancement in transportation and telecommunication, this result reveals ineffective operating of transportation system as well as telecommunication in Vietnam and matches with the advanced expectation.

Comparing impacts of this determinant on export value of different product groups manifests the compliance with economic theory and shows the strongest impact of this factor in the model for SITC 0 (food and live animals) in

particular and for primary product groups in general. This fact is reflected in high absolute values of negative coefficients with low level of p value (p value is smaller than 1% means high level of significant explanation of geographical distance in the models). To clarify for this fact, we give the reason that quality of food and live animals is influenced much more of transportation time in comparison with those of other groups, so the farther geographical distance, the much less export value of this product of Vietnam than the case of others.

The next distance need analyzing is economic distance. It causes positive impacts in the case of all groups except SITC 3 (This can be explained by its special characteristic that Vietnam's fuel for export is major input of many industries and requirements of quality of fuel do not vary much in different nation). In other word, the more different of importing country from Vietnam in economic term, the more import value of these groups of that country from Vietnam. As manifested in the table, the coefficients of variable $\ln EDIS_{ij}$ in the case of SITC 2 is highest, then the SITC 0, and all the others have results of great positive value of these coefficients with very high significant level (the p value of these coefficients are all lower than 5%). Hence, in general, the results all reflect that the hypothesis 4 is precise when state that the case of Vietnam matches with classical theory as H – O theory instead of new trade theory as economies of scale. And once again, the confirmation of this right is firmer with the higher coefficients in the models for primary product group (5.54) than in the model of manufactured product group (4.39).

The last variable in the models is common border. In deed, this variable has the correlation with the variable of geographical distance. However, because of its representation for many other factors such as similarity of tradition, of culture, of neighbor relationship this variable is still remained in the models. And the result indicates positive impacts of this factor as expected. In other word, Vietnam's export value of different product groups to the countries sharing the common

border with is greater than others in condition of *ceteris paribus*. In more depth, the export value of primary products is influenced only little due to the fact that they have low level of differentia while that of manufactured products is highly impacted because of having extremely differentiable characteristics. This fact is shown in the value of p lower than 5% and high value of the coefficients at 5.52 for manufactured group while these numbers in the case of primary group are only 15% and 3.12 respectively.

Reviewing the above analyses, the paper shows impacts of many factors (GDP and population of both importing and exporting countries; geographical and economic distance; real exchange value; free trade agreement; factor of sharing common border) on export value of different product groups. The group of factors has the most powerful impacts is distance with both geographical and economic terms and the group of factors has the weakest impacts is GDP of importing countries.

6. Policy implication

Basing on the result in section 5, this part of the paper will present a combination of solutions aim at spurring export value of all products groups of Vietnam. The solution is divided in three groups: solution to promote supply of goods for exporting; solution to adjusting Vietnam's exporting market; and solution to manage exchange rate and international cooperation accurately.

6.1. Promoting supply of goods for exporting

The first point of this sub section is given based on the result of positive impact of domestic economic growth on export of all groups, especially for the case of manufactured goods. This result implies that if the Vietnam economy transform its structure more in to this sector, the contribution of GDP growth rate to export will spur and there are much more products for export than otherwise.

Secondly, as can be seen from the estimation result part, Vietnam's population does not contribute much on export due to low productivity, so we need to increase effectiveness of this factor. We needs to enhance labor

productivity in all aspects by all means: improve quality of training human resources; developing education service systems; constructing a reasonable training program structure; and quickly solving the problem of lacking and low quality of labor in production of sector which are for export.

The third implications here is moving export product structure of Vietnam into manufactured group. This point come from the fact that export growth of primary groups cannot remain the constant level when GDP of importing countries grows because of specific characteristic of this group. Moreover, the ability of Vietnam to produce these goods (mostly are raw material and fuel) also at the level of upper restrain. Thus, we need to move concentration of export into the group of textile, footwear, electronic products, and computer, article products... which are the goods having potential and high price indices in export. The concentration should be put in both quantity and quality of these products. However, together with moving concentration, we still need to boost quality of the primary group because restrain in forcing export quantity means that the only way to remain high export value of them is increase their quality with higher price.

6.2. Adjusting Vietnam's exporting destination

Based on result of distance's negative impacts on export values, the first point in this group of implications is that: in the short term, we need to focus on the near market, especially those in Asia to reduce the limitation of distance (these markets are always main and potential market of Vietnam with some big economies such as Japan, Korea, and China.); and in the long term, Vietnam needs to develop transportation system and infrastructure to facilitate export, especially for primary products, which are influenced most negatively by geographical distance.

The second implication is based on positive impact of economic distance on export value. Economic distance has the strongest effects on group SITC 2 (Crude materials, inedible, except fuels) and SITC 0 (Food and live animals). Hence, exporting market of these products should focus on different advance

economies respect to their specific characteristics. For example in the case of SITC 0 - food and live animals products, Vietnam should boost export to United State or European Union, Japan... For rubber, Vietnam should boost export to Singapore, Germany, United state, Japan, Korea... Mean while, impact of this factor on others are not much. For these groups, we can also focus on market with similar in economic structure as nations in ASEAN or new market as Latin American and nations in African.

Due to the result of positive impact of importing courtiers' population, we also give the third implication here: Vietnam should force export to market with large population, especially for the group of final product such as foods and live animals (SITC 0) and miscellaneous manufactured articles (SITC 8) or for group of input for production which is labor – intensive such as SITC 2 (crude materials, inedible, except fuels).

Because the factor of sharing a common border has positive impact on all groups, Vietnam should exploit firstly all market that it shares the common border with, especially China market. With the common border, we have many advantages as near distance, similar of culture leading similar of demand for goods, close neighbor relationship, close corporation of politics. These factors easily remove barriers to trade of Vietnam and make smoothly export flow to neighbor countries than to others.

6.3. Managing exchange rate and international cooperation accurately

These above groups of implication relating to supply and demand side of Vietnam's export. The last group that we present in following is mentioned in a different aspect. This group includes policies of managing exchange rate and international corporation, which mostly relating to trade-attractive and trade-restrictive determinants.

Since the result of encouraging impact on export value of depreciation of Vietnam dong, the implication here is that Vietnam should continue devaluating domestic currency. However, the application of this method needs together a

careful consideration of other negative consequences such as inflation or retaliations of other countries. Thus, we need use this policy in a flexible way suitable to particular situation as well as different objects of economic development in different periods.

The positive impact of BTA and FTA variable implies that Vietnam should boost all negotiation process to sign more and more free trade agreement with other countries. However, the different impacts of BTA and FTA on different product groups also suggest that Vietnam should carefully evaluating impact of those agreements and choose the right group of products for cutting tariff and other barrier of import in negotiating process. Only in the case of Vietnam chooses the right ones for opener trade, the free trade agreement can be effective. More over, Vietnam also needs to suspiciously monitoring the implementing of these agreements carefully in order to take all their advantages for Vietnam's export activities.

7. Conclusion

Summing up, with the using of gravity model in study, the paper finds that: the factors as GDP of importing countries and population of Vietnam do not impact much on export value of any groups. Whereas, economic growth of Vietnam, population of importing countries, economic distance, increment of real exchange rate value, free trade agreement and factor of sharing common border (in land) have clearly positive impact on the export value of all groups. In contrast, the geographical distance has negative impacts on all groups. Basing on those results, three groups of solution to boost Vietnam' export value are given: promoting supply of goods; adjusting Vietnam's exporting market; managing policy of exchange rate and international cooperation.

Those above are some achievement of the research. However, there are still some limitation of the paper as the low value of R^2 and adjust R^2 . This means that there is lack of some variable in the models. Hence, the result cannot be satisfied

here and there is the direction of finding out more variables in future research in this field when we can collect more data and factors into the models.

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Factors	Trend of impacts	Previous paper
Factors relating to demand and supply		
GDP generalised from GDP of both import and export countries	Positive	Từ Thúy Anh and Đào Nguyên Thắng (2008), Do Thai Tri (2006), Đào Ngọc Tiến (2009), Tiiu Paas (2000), Nguyễn Thanh Thủy and Jean-Louis Arcand (2009)
GDP of exporting country	Positive	Céline Carrere (2003), H. Mikael Sandberg (2004), Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003),
GDP of importing country	Positive	Céline Carrere (2003), H. Mikael Sandberg (2004), Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003)
Population generalised from population of both import and export countries	Positive	Đào Ngọc Tiến (2009), Do Thai Tri (2006),
Population of exporting country	Positive Negative	K. Doanh Nguyen and Yoon Heo (2009) and H. Mikael Sandberg (2004) Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003), Jacob A. Bikker (2009)
Population of importing country	Negative	Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003), Céline Carrere (2003), Jacob A. Bikker (2009)
Attractive/ restrictive factors		
<i>Policy of encouraging and managing export and import</i>		
Tax	Negative	Đào Ngọc Tiến (2009)
Bilateral trade agreement/ Free trade area	Positive Negative	Céline Carrere (2003) (<i>NAFTA, ASEAN, CACM</i>) Từ Thúy Anh and Đào Nguyên Thắng (2008) (<i>ASEAN</i>), Céline Carrere (2003) (<i>MECORSUR</i>)
Exchange rate (depreciation of domestic currency)	Positive	Do Thai Tri (2006), Nguyễn Thị Quy et.al. (2008), Inmaculada Martínez-Zarzoso và Felicitas Nowak-Lehmann D. (2003)

<i>Distance</i>		
Geographical distance	Negative	Céline Carrere (2003), K. Doanh Nguyen and Yoon Heo (2009), Tiiu Paas (2000), Đào Ngọc Tiến (2009)
Economic distance	Positive	Egger (2000), Di Mauro (2000), Freund (2000), Gilbert, Scollay and Bora (2001)
	Negative	Inmaculada Martínez-Zarzoso and Felicitas Nowak-Lehmann D. (2003)
Common border	Positive	Li (2000), Soloaga and Winters (2001), Clark and Tavares (2000), Freund (2000), Gilbert, Scollay and Bora (2001)
Common language	Positive	Boisso and Ferrantino (1997), Frankel (1997), Fink and Primo Braga (1999), Krueger (1999a), Soloaga and Winters (2001), Clark and Tavares (2000)
Cost of transportation (CIF/FOB)	Negative	Geraci and Prewo (1977)
Common currency	Positive	Rose (2000)

Annex : Determinants and trend of their impact on bilateral traded value in economic researches

Source: generalizing by authors and from Đào Ngọc Tiến (2009)

