

Analysis of the Determinants of Trade Balance: A Case Study of Vietnam

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Abstract

The study is focusing on the analysis of the determinants of trade balance in Vietnam. Vietnam has greatly expanded a large volume of exports and imports in recent years whereby Vietnam has a very high degree of trade openness. Using the sample and the secondary data covering the period of 2005 – 2018 and collecting from General Statistics Office, the State Bank of Vietnam, publications and other Vietnamese data with the theoretical framework of trade balance, the study finds that foreign direct investment had a significant and negative effect on trade balance. This result reflects that increase in FDI may worsen trade balance. The openness of the economy has a significant and negative effect on the trade balance. Finally, the exchange rate has insignificantly contributed to the change of trade balance.

Keywords: trade balance, exports, imports, FDI, and exchange rate

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1. Introduction

The trade balance of most of the developing countries and countries in transition has been widely focused on encouraging to the extent that every presence of foreign investment attraction. In fact, a large number these countries have been faced trade deficits in their economy, in contrast developed countries have been cumulated much surpluses in trade. Generally, this performance has been taken part in the poor economic strategies and most of these developing countries and countries in transition have usually been dependent on certain specific primary products for their exports meanwhile import a lot of the manufactured and high technological goods and services thus huge trade deficit in their economy has been widen.

In general, trade balance is explained by the measurement of the difference between exports and imports of goods and services of a country during a specific period of time. The trade balance includes the tangible balance, indicate the difference between revenues from exports and expenditures from imports of goods. In addition, the intangible balance is the balance measures the one-way gap in services, income and current transfers.

Vietnam's economy is a socialist-oriented market economy, Vietnam's move from a centrally planned in the past to a market economy in the present, Vietnam has been the hub of FDI inflows and continued to attract record FDI in recent years. Vietnam has already owned many comparative advantages and a strong investment climate to FDI projects. FDI projects have generated trade balance, trade openness of the economy and promoted economic development in the country. Since 1990's and especially 2000s, the values of Vietnamese imports have greatly exceeded exports, resulting in large trade deficits in the economy although more exports have been conducted during 2015 – 2018.

The determinants of trade balance have predominantly inspired academics to find a large number of empirical studies in developing countries, developed countries and countries in transition. In addition, main factors influence the balance of trade that has been focused at the center of the relevant studies of Sodersten (1980), Cavalcanti (2001), Calderon et al. (2002), Chinn & Prasad (2003), Zhang and Wan (2004), Goldberg et al. (2006), Gruber & Kamin (2007), Rahman (2008). In which, macroeconomics has been focused on numerous empirical studies based on Sodersten (1980), Cavalcanti (2001), Calderon et al. (2002), and Rahman (2008). As presented in some recent studies, the impact of every presence of foreign investment on the trade balance has been examined (Gruber & Kamin (2007), Rahman (2008).

Followed by ordinary least square (OLS) technique with selected data on Vietnam in the period of 2005 – 2018, the significance aim of this study is to estimate the determinants of trade balance.

The objective of the study is to re-examine by estimating and identifying the main factors that affect Vietnam's trade balance meanwhile the specific objectives of the study are to find out the main causes of the trade deficit so that new policy measures can be raised up to reduce the volume of trade deficit in Vietnam.

The importance of the paper is to discover the findings in order consult to the researchers, policy makers and the Foreign Investment Agency (FIA) serves as Vietnam's investment promotion agency of the Ministry of Planning and Investment. The rest of the paper is organized as follows: Section 2 presents the literature review whereas Section 3 discusses the data and methodology such as the model specification and estimation technique. Further, Section 4 discusses the results and then Section 5 proposes the main recommendations.

2. Literature Review

As analyzed in numerous empirical studies, the trade balance is significantly affected by the various factors from trade policy, investment policy, exchange rate policy, and other policies. According to Dornbusch and Krugman (1976) introduced that the finding of the J-curve phenomenon to describe the evolution of the trade balance has been impacted by exchange rate. It is evident that the short elasticity of demand and supply of foreign currencies in a short time create the J curve phenomenon. Specifically, existence of the short-term decline of net exports due to a devaluation of the exchange rate, and the improvement of net exports in later future can be found. Dornbusch and Krugman (1976) also described that the trade balance situation would probably worsen because of trade deficit increases in the short-term.

The study of Sodersten (1980) who discussed that the relationship between either import or export and trade balance can be found. It exists the correlation of imports of goods and services at the CIF price including the price of goods (cost), insurance costs (insurance) and shipping costs (freight) with the exports. In addition, exports might be calculated at FOB price whereby foreign customers may probably be paid excluding insurance and shipping costs. In the discussion of Rodríguez and Rodrik (2000), it is evident that there is the relationship between trade policy and economic growth. In general, trade policy refers to regulations and other agreements that significantly affect imports and exports in the domestic countries to foreign countries. Numerous trade agreements have been widely developed nowadays in both developed countries and developing countries, including NAFTA, CAFTA, CPTPP, FTA and the Middle Eastern Trade Initiative, as well as specific regulations, subsidies in farm and breed, and tariffs policies.

Cavalcanti (2001) deeply analyzed the trade balance in a Latin American country such as Brazil. The study has a discussion of trade balance and current account balances in the period of time 2001/03. Cavalcanti (2001) indicated that external deficits may exactly persist during this time, in which giving an international environment characterized by decreasing capital flows, this may significantly impose considerable limitations on the growth in the domestic market. Expanding the discussion of possible external adjustment strategies and some suggestions for domestic market, the adjustment strategy can be impacted on either the devaluation of exchange rate or additional investment in the capacity of production.

Calderon et al. (2002) deeply examined that the empirical relationships between

deficits of current account and a broad set of economic factors such as domestic output, exchange rate, savings rates, and growth rates, interest rates in developing countries by conducting on the panel data in all 44 developing countries in the period 1966-95; differentiating between within-country and cross-country effects. Some factors findings are, firstly, an increase in current account deficits is highly associated with a rise in growth of domestic output and unexpected problem that either an increase in terms of trade or the changes of real exchange rate can be affected. In addition, a higher level of savings rates, a higher level of growth rates in industrial economies, and a higher level of international interest rates tend to generate opposite effect.

Using the sample to cover 18 industrial countries and 71 developing countries during the period of 1971-95, the medium-term determinants of current accounts for a large sample of industrial and developing countries have been focused. Chinn & Prasad (2003) found that current account balances are positively and significantly consistent with the balances of government budget and the initial stocks of net outside assets. Among the developing countries, the measures of financial deepening are positively connected with the balances of current account meanwhile the openness to international trade are negatively and significantly consistent with the balances of current account.

Using the model of a structural VAR which followed the empirical frameworks of Hoffmaister and Roldós (2001), and using macroeconomic indicators in developing countries of Brazil and Korea, in which, Zhang and Wan (2004) strongly focused on analyzing China's trade balance during the years of 1985–2000, and to differentiate forces which cause the long-term trend in commercial balance from those with instant effect. Focusing on four kinds of shock, such as foreign supply shock, domestic supply shock, relative demand shock and finally nominal shock, the effects are predominantly investigated, firstly, the changes of the trade balance in China are largely the aftermath of a set of real shocks. Second, the Renminbi is underestimated, an increase in exchange rate bear a little on the trade balance. It is therefore that measures in monetary policies can not suffice to restore China's trade 'imbalance'. Similarly, Goldberg et al. (2006) also analyzed the changes of dollar exchange rate significantly affect the international trade cooperation between countries invoicing some of their trade partners in dollars, even occurring if these countries have been not transacting directly with the United States of America.

As suggested in Gruber & Kamin (2007), examining on 84 countries from 1982 to 2006 for the global pattern of the imbalances of current account between the large U.S. current account deficit and the large surpluses of Asian developing economies, particularly in China. Applying a panel-regression approach, the study also find that the Asian partners' surpluses are predominantly explained by a set of determinants of trade balance such as financial crises, economic development. Additionally if added by measures of institutional quality, it is said that it fails to explain the large U.S. current account deficit.

As shown by Rahman (2008) on a study, using the dataset of 10 new EU members states or countries like Czech Republic, Bulgaria, Estonia, Hungary, Latvia,

Lithuania, Poland, Romania, Slovakia and finally Slovenia, a major finding is found. On average, most of these countries have the existence of current account deficit that are mostly higher than the current account deficit of other developing countries in the region. In addition, the effect in among groups is too different, such as a diverging pattern with a group of Baltic countries, Bulgaria and Romania, beside that a stabilization in current account balances is mostly found, and a group of experiencing countries is rapidly widened in the balances of current account. Further, Christiansen et al. (2009) pointed out that domestic financial liberalization is associated with trade balance change, while capital account liberalization had the negative effect in low-income countries. Recently, Yang (2011) emphasized that the factors such as NFA, trade openness or REER can probably affect the trade balance in the emerging Asian countries.

A study conducted by Tu and Dao (2008) assessment of trade between Vietnam and ASEAN+ 3 (China, Japan, and South Korea), it is evident that the policy of trade deficit had been the goal of economic growth due to the J-curve effect. Further, Nguyen (2011) said that VND devaluation is likely to enhance the competitiveness of exports, besides, the decrease exchange rate may significantly boost exports and exactly decline imports. In addition, To & Nguyen (2012) showed that Vietnam's trade deficit has been happened due to the asymmetry of the structure in the economy, specifically, trade and investment policies, trade openness, FDI, and exchange rates.

3. Methodology

3.1 Data

The study used the annual and the secondary time series data covering the period between 2005 and 2018. Equation is exactly estimated by using ordinary least square (OLS) technique with selected data on Vietnam. More specific, all the data has been retrieved from the General Statistics Office, the State Bank of Vietnam, World development indicators (WDI), publications and other Vietnamese websites. The collected independent and dependent variables are shown in Table 1.

Table 1: Independent and Dependent Variables

Variable	Measurement	Source
GDP	Gross Domestic Product at current prices	GSO (General Statistics Office)
EX	Value of Exported goods	GSO
IM	Value of Imported goods	GSO
OPENNESS	Commercial Openness $\text{OPENNESS} = \frac{\text{EX} + \text{IM}}{\text{GDP}} \cdot 100\%$	GSO
FDI	Actual Foreign Direct Investment	GSO
EXR	Exchange Rate at the end of the period	SBV (State Bank of Vietnam)
BoT	Balance of Trade $\text{BoT} = \text{EX} - \text{IM}$	GSO

3.2 Estimated Equation

This study examines with a reduced model of direct relationship between trade balance and its determinants that are discussed in above and followed by the studies of Sodersten (1980), Cavalcanti (2001), Calderon et al. (2002), Chinn & Prasad (2003), Zhang and Wan (2004), Goldberg et al. (2006), Gruber & Kamin (2007), Rahman (2008), the equation estimation is written as follows:

$$\text{BOT} = a + b * \text{FDI} + c * \text{OPENNESS} + d * \text{EXR} + e$$

4. Results

4.1 Trade Balance between Vietnam and the Rest of the World

Vietnam has been one of the fastest growing economies in the world and been a developing country with GDP per capital at roughly \$3000. According to the World Bank, as a lower middle-income country with a population of 96 million, Vietnam has greatly become a major partner with USA, Japan, South Korea, and some large economies. The country has greatly encountered a large number of trade deficit during the period of time 2005 – 2018 and thus current account deficit in most years. To be complementary, Vietnam has attracted a large number of FDI projects and a large volume of actual FDI meanwhile a huge openness of the economy. The descriptive analyses are presented in Table 2 below.

Table 2: Descriptive Analyses

Year	BoT (million USD)	Actual FDI (million USD)	OPENNESS (%)	EXR (VND/USD)
2005	-4314	3,308	131	15,916
2006	-5064.9	4,100	128	16,054
2007	-14203.3	8,030	157	16,114
2008	-18028.7	11,500	165	16,977
2009	-12852.5	10,000	137	17,941
2010	-12646.7	11,000	150	18,932
2011	-9844.1	11,000	167	20,828
2012	2888.93	10,460	145	20,828
2013	142.4	11,510	155	21,036
2014	1984	12,350	161	21246
2015	-3170	14,500	171	21,890
2016	2680	15,800	172	22,159
2017	2674	17,500	190	22,425
2018	7211	19,100	199	22,825

Source: Author's compilation

Table 3 shows that FDI disbursement in Vietnam during 2005-2018 has significantly changed at a rocket increase from \$3,3 bn in 2005 to \$19.1 bn in 2018. In addition, the openness of the economy is too high at over 100 percent, showing that Vietnam's economy is too much dependent on trade.

4.2 Estimated Results

Firstly, we test the stationarity of the time series, with a 10% significance level, the series do not stop, but the first-order differential series are all stop.

Table 3: Station test for first-order differential time series

Null Hypothesis: D(BOT) has a unit root			Null Hypothesis: D(FDI) has a unit root		
Exogenous: Constant			Exogenous: Constant		
Lag Length: 0 (Automatic based on SIC, MAXLAG=2)			Lag Length: 0 (Automatic based on SIC, MAXLAG=2)		
	t-Statistic	Prob.*		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-3.358656	0.0353	Augmented Dickey-Fuller test statistic	-2.911685	0.0730
Null Hypothesis: D(OPEN) has a unit root			Null Hypothesis: D(EXR) has a unit root		
Exogenous: Constant			Exogenous: Constant		
Lag Length: 1 (Automatic based on SIC, MAXLAG=2)			Lag Length: 0 (Automatic based on SIC, MAXLAG=2)		
	t-Statistic	Prob.*		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.216624	0.0022	Augmented Dickey-Fuller test statistic	-2.719602	0.0991

Source: Author

Based on the Table 4, the estimation equation need to be transformed into the first-order differential time series, which are denoted by D_BoT, D_FDI, D_OPEN, D_EXR respectively. Now, we develop the analysis in cases.

4.2.1 Model 1

Table 4: Estimated Result

Dependent Variable: D_BOT				
Method: Least Squares				
Sample (adjusted): 2006 2018				
Included observations: 13 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4421.240	1381.254	3.200887	0.0084
D_FDI	-2.909919	0.740566	-3.929317	0.0024
R-squared	0.583956	Mean dependent var	886.5385	
Adjusted R-squared	0.546134	S.D. dependent var	5609.635	
S.E. of regression	3779.187	Akaike info criterion	19.45304	
Sum squared resid	1.57E+08	Schwarz criterion	19.53996	
Log likelihood	-124.4448	Hannan-Quinn criter.	19.43518	
F-statistic	15.43953	Durbin-Watson stat	2.406397	
Prob(F-statistic)	0.002355			

Source: Author

The results are written as follows:

$$D_BoT_t = \beta_1 + \beta_2 * D_FDI_t + u_t$$

$$D_BoT_t = 4421.24 - 2.909919 * D_FDI_t + u_t$$

(i) Test the non-zero of the estimated coefficients

At a significance level of 5%, the regression coefficient of the variable D_FDI is statistically significant.

(ii) Heteroskedasticity test. It is evident that at a 5% significance level, there is no heteroskedasticity phenomenon in model 1 (see Table 5). Further, Testing the autocorrelation phenomenon, no correlation phenomena of lags 1, 2, 3, 4 can be found (see Table 6). Table 7 shows that at a 5% significance level, even if adding 1 or 2 elements to the model, the model is well specified.

Table 5: Heteroskedasticity Test

Heteroskedasticity Test: White			
F-statistic	0.727657	Prob. F(2,10)	0.5069
Obs*R-squared	1.651556	Prob. Chi-Square(2)	0.4379
Scaled explained SS	0.656633	Prob. Chi-Square(2)	0.7201

Source: Author

Table 6: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:				Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.248234	Prob. F(1,10)	0.2900	F-statistic	0.692105	Prob. F(2,9)	0.5253
Obs*R-squared	1.442630	Prob. Chi-Square(1)	0.2297	Obs*R-squared	1.732893	Prob. Chi-Square(2)	0.4204
Breusch-Godfrey Serial Correlation LM Test:				Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.986328	Prob. F(3,8)	0.1947	F-statistic	1.705799	Prob. F(4,7)	0.2521
Obs*R squared	5.549601	Prob. Chi-Square(3)	0.1357	Obs*R-squared	6.416862	Prob. Chi-Square(4)	0.1701

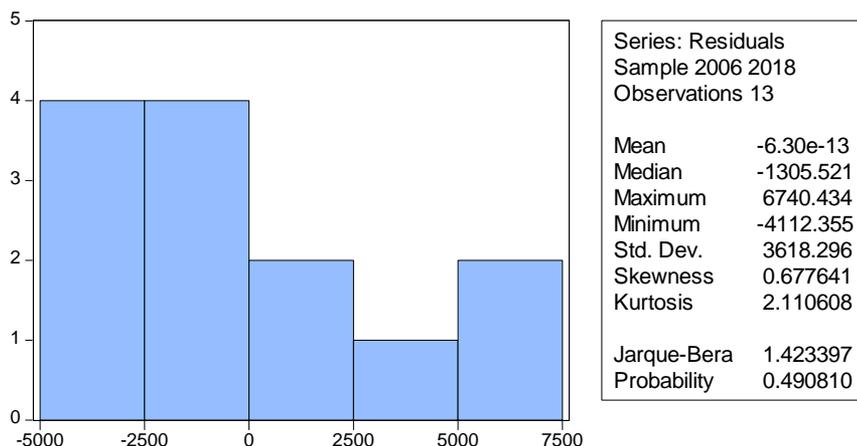
Source: Author

Table 7: Model Specification Test

Ramsey RESET Test:				Ramsey RESET Test:			
F-statistic	0.205179	Prob. F(1,10)	0.6602	F-statistic	0.146331	Prob. F(2,9)	0.8659
Log likelihood ratio	0.264033	Prob. Chi-Square(1)	0.6074	Log likelihood ratio	0.416007	Prob. Chi-Square(2)	0.8122

Source: Author

Table 8 shows the test of the normal distribution of residual. It is evident that at a 5% significance level, the residual is normally distributed. As the theory, model 1 is acceptable because the regression coefficients of D_FDI are statistically significant, both heteroskedasticity phenomenon and autocorrelation phenomenon cannot be found, model is well-specified while the residual is normally distributed. It is evident that foreign direct investment had a significant and negative effect on trade balance in the period 2005-2018 in Vietnam. This result reflects that increase in FDI may worsen trade balance. In the case of Vietnam, because of comparative advantages of cheap labor and huge workforce, FDI has mainly invested in assembly rather than high technologies and knowledge transmit.

Table 8: Residual's Normal Distribution Test

Source: Author

4.2.2 Model 2

Table 9: Estimated Results

Dependent Variable: D_BOT				
Method: Least Squares				
Sample (adjusted): 2006 2018				
Included observations: 13 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2226.751	1206.223	1.846053	0.0919
D_OPEN	-256.2171	75.91540	-3.375035	0.0062
R-squared	0.508728	Mean dependent var		886.5385
Adjusted R-squared	0.464067	S.D. dependent var		5609.635
S.E. of regression	4106.671	Akaike info criterion		19.61925
Sum squared resid	1.86E+08	Schwarz criterion		19.70617
Log likelihood	-125.5251	Hannan-Quinn criter.		19.60139
F-statistic	11.39086	Durbin-Watson stat		1.229599
Prob(F-statistic)	0.006197			

Source: Author

The results are written as follows:

$$D_BoT_t = \beta_1 + \beta_2 * D_OPEN_t + u_t$$

$$D_BoT_t = 2226.751 - 256.2171 * D_OPEN_t + u_t$$

Table 9 shows the test the non-zero of the estimated coefficients

At the significance level of 5%, the estimated coefficient of the variable D_OPEN is also statistically significant. For Heteroskedasticity test, Table 10 and Table 11 indicate that no heteroskedasticity phenomenon in model 2 as well as no correlation phenomena of lags 1, 2, 3, 4 can be found. Table 12 shows that for model specification test, the model is well specified.

Table 10: Heteroskedasticity Test

Heteroskedasticity Test: White			
F-statistic	0.618711	Prob. F(2,10)	0.5580
Obs*R-squared	1.431509	Prob. Chi-Square(2)	0.4888
Scaled explained SS	0.156517	Prob. Chi-Square(2)	0.9247

Source: Author

(iii) Testing the autocorrelation phenomenon

Table 11: Serial Correlation Test

Breusch-Godfrey Serial Correlation LM Test:				Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	1.061525	Prob. F(1,10)	0.3271	F-statistic	0.523542	Prob. F(2,9)	0.6094
Obs*R-squared	1.247552	Prob.Chi-Square(1)	0.2640	Obs*R-squared	1.354829	Prob.Chi-Square(2)	0.5079

Breusch-Godfrey Serial Correlation LM Test:				Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	2.110798	Prob. F(3,8)	0.1772	F-statistic	1.441610	Prob. F(4,7)	0.3150
Obs*R-squared	5.743711	Prob.Chi-Square(3)	0.1248	Obs*R-squared	5.871936	Prob. Chi-Square(4)	0.2089

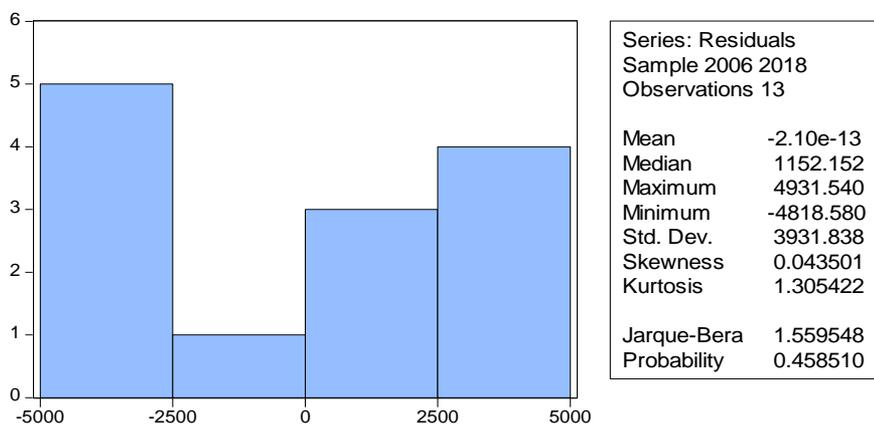
Source: Author

Table 12: Model Specification Test

Ramsey RESET Test:				Ramsey RESET Test:			
F-statistic	0.350199	Prob.F(1,10)	0.5671	F-statistic	0.162655	Prob. F(2,9)	0.8523
Log likelihood ratio	0.447468	Prob.Chi- Square(1)	0.5035	Log likelihood ratio	0.461599	Prob. Chi-Square(2)	0.7939

Source: Author

Table 13: Residual's Normal Distribution Test



Source: Author

Table 13 describes the test of the normal distribution of residual. At a 5% significance level, the residual is normally distributed. As the theory, model 1 is acceptable because the regression coefficients of D_FDI are statistically significant, both heteroskedasticity phenomenon and autocorrelation phenomenon cannot be found, model is well-specified while the residual is normally distributed.

In the case of Vietnam, the commercial openness of the economy has a significant and negative effect on the trade balance in the period of 2005-2018. In particular,

trade liberalization has greatly contributed to increase exports through opening up a large number of opportunities to the world market meanwhile it is also increasing imports at large scale.

4.2.3 Model 3

Table 14: Estimated Results

Dependent Variable: D_BOT				
Method: Least Squares				
Sample (adjusted): 2006 2018				
Included observations: 13 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	837.8176	2342.276	0.357694	0.7273
D_EXR	0.091673	3.174163	0.028881	0.9775
R-squared	0.000076	Mean dependent var		886.5385
Adjusted R-squared	-0.090826	S.D. dependent var		5609.635
S.E. of regression	5858.851	Akaike info criterion		20.32993
Sum squared resid	3.78E+08	Schwarz criterion		20.41685
Log likelihood	-130.1446	Hannan-Quinn criter.		20.31207
F-statistic	0.000834	Durbin-Watson stat		2.116342
Prob(F-statistic)	0.977477			

Source: Author

Table 14 shows that regression coefficient of exchange rate is not statistically significant at the 5% significance level. Therefore, it is evident that the exchange rate has not contributed to the increase trade balance. If the nominal exchange rate increases, the goods and services in the country will be more competitive in the international market, especially in the long run. In the case of Vietnam, the country has been much dependent on raw imports and exports, the trade balance has insignificantly affected due to exchange rate change.

5. Conclusion

From the estimated results and the findings we have discussed above, here are some recommendations:

Firstly, Vietnam continues to attract more foreign investment. This process will generate a great influence on Vietnam's trade balance, especially in both exports and imports. In developing country like Vietnam, FDI sector plays an important role in economic growth and trade expansion and enhancement of trade balance as well as narrow of trade deficit. The government should commit and create the fair regulations between domestic investors and foreign investors, also maintain a large volume of incentives in the field of high technology in order to attract high quality of foreign investment.

Secondly, Vietnam needs to develop supporting industries in order to absorb new technology and Vietnamese skilled workers. Compared to Thailand, one of the

leading countries in supporting industries, Vietnam lacks a number of good policies and strategies. The development of the supporting industries focuses on the major strategies in specific sector, i.e electronics and mechanical engineering industries; garment and textile, leather, and footwear industries; hi-tech industries. Further, Vietnamese supporting industry companies have to compete with international counterparts in China, Thailand, Malaysia and other emerging countries in Asia Pacific. In fact, Vietnamese manufacturers have not been able to supply most of the spare parts for Japanese, Taiwanese and other foreign customers in the host country.

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