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Trade Liberalization, Consumption, and Real Exchange Rate in Seven ASEAN+6 Countries

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Abstract: Trade liberalization has been mushrooming in the globalization era. The trade liberalization policy adoption by one country will be followed shortly by another. Although trade liberalization policy is strongly advocated by international organizations, a few prominent economists argue there is no 'one fits for all' policy. Thus, the policy effect altogether with other relevant aspects still needs to be explored in case by case basis, including ASEAN+6 regions. This paper is intended to analyze the relationship of trade liberalization and consumption on the real exchange rate in seven ASEAN+6 countries – the most dynamic region during period 2000 – 2011, a period covering subprime mortgage crisis. With data panel approach, the paper investigates the relationship of trade liberalization and consumption on real exchange rate while taking into account level of country's income and crisis effect. The resulted model finds significant relationship in the overall and individual effect of tariff and terms of trade change as proxies of trade liberalization, consumption, level of country's income, and subprime mortgage crisis on real exchange rate.

Keywords: *ASEAN+6, Consumption, Exchange Rate, Trade Liberalization, Free Trade Area*

1. Introduction

In a globalized world nowadays, only countries with autarky system - if any – are not affected by the economic condition of other countries. ASEAN countries and their trading partners as part of globalized world are no exception, they are also affected by economic condition in other countries. In 1998 the economic crisis mainly affected main ASEAN countries, while in 2008 the crisis left the small open economy like Singapore to also suffer (Kohler, 2010). In comparison with the period before globalization, the upcoming crisis in globalization era could happen in a shorter period of time (Roubini and Mihm, 2010; Stiglitz, 2010). The interconnectedness created from globalization helps make the global economy more susceptible to economic shocks and crises (OECD, 2011). Globalization opens restrictions for many aspects, including trade. In line with globalization, many industrialized countries supported by international institutions promoted trade liberalization policy as a policy recommendation for all countries, both developed and developing ones. However, not everyone agrees that trade liberalization is a good policy option for every country (Stiglitz and Charlton, 2005; Reinert, 2007, Siddiqui, 2015). Many non-governmental organization have opposed it as seen in the people rallies held outside many international forum. Studies related with trade liberalization and its relevant aspects especially in cases including developing countries should be encouraged. With good and deep comprehension on trade liberalization policy adopted and its relevant aspects, every country - including developing countries - can manage its development goals to be more sustainable.

This study is developed by a theoritical and empirical framework from previous research and textbook that trade liberalization policy adopted and the consumption trend of change reflected in increasing export import potentially affect regional or national currency value, due to their effects on demand and supply of the currency. The argument why it is important to analyze is the stability of currency value in the long run proves to be crucial for sustainable economic growth, and its correlation with public policy decisions adopted including trade liberalization should not be taken for granted. Other relevant characteristics and situations which might have influence (i.e. country's level of income and crisis period) are then also considered in formulating the best variable relationship. This paper is intended to analyze the effect of trade liberalization and consumption on the real exchange rate in seven ASEAN+6 countries during period 2000 – 2011, a period incorporating subprime mortgage crisis 2008. With data panel approach, the paper seeks the relationship of trade liberalization and consumption on real exchange rate while taking into consideration country's level of income differences and crisis effect during the economic crisis period. This paper will be divided into three sections. First section will discuss the paper background and underlying literature review in determining both the endogenous and exogenous variables elaborated in the model. Second section will provide the methodology employed. The third section will cover analysis of the model outcome, its policy implications, and concluding remark.

2. Literature Review

Currently, more and more trade liberalization agreement have been concluded in bilateral or regional forum. The uncertainty in the conclusion of current WTO Doha round has shifted the focus of many countries liberalization efforts through the establishment of free trade area scheme in respective regions. This phenomenon has also happened in Asia, especially in the group of countries located in the most dynamic regions in Southeast Asia, East Asia, South Asia, and Oceania, known as ASEAN +6. A large number of FTAs involving the countries have been established and new rounds of negotiations have been initiated to improve the level of liberalization in the region. During 2002 until Januari 2013, the number of FTAs involving ASEAN+6 countries have increased more than six times from 27 to 179, with 130 of them are bilateral FTAs. The total FTA amount involving ASEAN+6 accounts for 70% of the total FTA involving Asia (ADB, 2013). Several papers have elaborated the linkages of those variables in a separate manner both theoretically and empirically. In addition, none of them have also investigated the relationship in ASEAN+6 regions - the most dynamic region even in the world. Moreover, the resulting conclusions and evidence from those papers are mixed and challenge further studies.

There are two principal aspects of liberalization policy: change in import tariff and change in terms of trade. Traditional policy literature indicates that in trade liberalization a tariff reduction will lead to real depreciation, and increased terms of trade will induce real exchange rate appreciation (Edwards, 1987a). Several following studies support this proposition. Reduction of import tariff liberalization can lead to depreciation was the evidence found in Tokarick (1995), Head & Ries (1999), Jimoh (2006), Insaidoo & Obeng (2008), while the simulation outcome of increased terms of trade leading to an appreciation of real exchange rate is found in Mendoza (1995). The relationship of trade liberalization and real exchange rate may be found in Edwards (1987a; 1987b; 1987c), Tokarick (1995), Mendoza (1995), Head and Ries (1999), Jimoh (2006), Insaidoo and Screwdriver (2008), Zakaria and Ghauri (2011), and Ju-Ai Ng (2013). Furthermore, the answer to the relationship of macroeconomic variables and real exchange rate has been discussed in several studies such as Devereux and Hnatkovska (2011), Edwards (1987b), Lin (1996), Mussa (1984), Obstfeld (1984), Ravn, Schmitt-Grohe, Uribe (2007), and Ravn, Schmitt-Grohe, Uribe (2012).

As mentioned in the theoretical study of Tokarick (1995) and the empirical study of Head & Ries (1999) in Canada, the relaxation of import barriers by reducing import tariff induces real exchange rate to depreciate. Insaidoo & Obeng (2008) empirically finds that since the opening of market access for import products and import tariff reduction during liberalized import regime in Ghana in 1967, Ghana real exchange rate depreciated by 43%. While the work of Jimoh (2006) in Nigeria finds depreciating domestic currency by 13% as a result of liberalization policies in 1986/1987 through import tariff reduction. Results of impulse response analysis in the three-sector model of intertemporal equilibrium in Mendoza (1995) conclude that the increased terms of trade induce exchange rate appreciation. In the simulation, 50% of the variability in real exchange rate is contributed by terms-of-trade disturbances. All the papers mentioned above have put trade liberalization as exogenous while real exchange rate as endogenous. In relation with macroeconomic variables as other exogenous variables in the relationship of trade liberalization and real exchange rate, the need to include macroeconomic variables to complete the relationship is mentioned in Edwards (1987c). It does not specify those macroeconomic variables yet describes them as “relative capital intensities among importables, exportables and non-tradables, sign and magnitudes of the elasticity of demand and supply and the relative importance of the income effect". Edwards’s argument to add other variables is in line with Mussa (1984) who argues to accommodate variables related with "the divergence between the actual level of net foreign assets held by domestic residents and the long-run desired level of such holdings" and "demands for goods and desired level of domestic spending". Thus, both arguments support the possibility of incorporating macroeconomic variables such as level of consumption, a close proxy for demand for goods.

Macroeconomic theory of open economies provides some explanatory models relating financial market, net capital outflow, and foreign currency market as seen in Mankiw (2012). Several cases (e.g. government deficit, capital flight and import quota) employing the models have been illustrated. The theory in Mankiw (2012) which is IS-LM model or its expanded model may be explored to explain the relationship of consumption and real exchange rate. Other relevant yet contrary with the theory is sourced from Ravn, Schmitt-Grohe, Uribe (2012). Increasing consumption is correlated with depreciating real exchange rate

(Devereux & Hnatkovska, 2011). Their argument is in contrary with basic prediction of efficient risk-sharing – relative consumption growth rates across countries or regions should be positively related to real exchange rate growth rates across the same areas. While Lin (1996) found that although household consumption is a significant element in explaining the long run movement of real exchange rate in South Korea and Taiwan, this variable is likely not a reliable fundamental affecting real exchange rate and thus should be combined with other variables on the supply side.

3. Methodology

Although the region – it is marked with level of income disparities, some are high income countries the others are middle and low income countries - has been having dynamic economic growth and has been generating trade surplus for a reasonably long time period, yet several economic crisis happening in the past has severely hit their trade balance and growth. Period 2000-2011 is selected as period of investigation taking several aspects for consideration. First, during the period ASEAN countries with their trading partners agreed to involve intensively in FTAs [i.e. ASEAN-China FTA (2002), ASEAN-Japan FTA (2003), ASEAN-India FTA (2003), ASEAN-Korea FTA (2005), ASEAN-Australia-New Zealand FTA (2009)][1]. Consumption level as indicated by import volume increased quickly and surpassed US$ 1 trillion in 2015, the value is more than triple the import volume in year 2000[2]. Second, the author intends to analyze if the correlation of real exchange rate with trade liberalization and consumption is different in normal times and crisis time. Period 2000-2011 can provide complete picture of period in normal times and crisis time. After 1998 crisis, ASEAN economy recovered back to normal. The economy then experienced the boom and afterwards it slowly declined to reach the bust in 2008. The data availability is another matter. This study covers seven ASEAN+6 countries (Australia, China, Japan, Malaysia, New Zealand, Philippines, and Singapore). Observation period is year 2000 - 2011 and relevant data is collected from World Bank publication data.

The maximum effort has been conducted to cover every ASEAN+6 member country and the longest data period in the study coverage. Nonetheless, not every country member of ASEAN + 6 has a complete set of database for all exogenous variables examined: trade liberalization in terms of trade and tariff reduction, consumption, and endogenous variable : real exchange rate (RER); thus, only the data of seven member countries could be incorporated. Those countries are Australia, China, Japan, Malaysia, New Zealand, Philippines, and Singapore. I have tried to cover observation data as extensive as possible. Yet, I am subsequently aware that several variables in several countries such as terms of trade and real exchange rate have a data series starting from year 2000 only. In that regard the best effort to provide necessary data has been limited to 2000 - 2011 period only, which covers high income and middle and low income countries and also crisis period 2008-2010. Several hypotheses based on theoretical and empirical findings are proposed in this study as follows:

- Trade liberalization in terms of tariff reduction, terms of trade, consumption, country's level of income and crisis period together or individually affect the real exchange rate (see Edwards, 1987c; Mussa, 1984).
- There are range of possible hypothesis from both theoretical and empirical perspectives which show complexity and contrasts one another to describe the relationship of trade liberalization to exchange rate.

Theoritically, there are three mainstreams describing the relationship of trade liberalization to exchange rate. The first is trade liberalization - through tariff and non-tariff restrictions reduction – will lead to depreciating RER, referring to traditional policy literature as mentioned by Edwards (1987c). Tokarick (1995) concluded similar conclusion with this mainstream. The second one is that trade liberalization – through terms of trade improvement – will induce appreciating RER, as concluded by Gregorio & Wolf (1994) and Mendoza (1995). The third one is there is no general or universal conclusion that can be drawn from the relationship of trade liberalization (through the change of tariff and terms of trade) and RER; thus the relationship should be drawn from case by case basis. Edwards (1987b) concluded "It is shown that in the more general case ..... it is not possible to know how changes in tariffs or the terms of trade will affect the equilibrium path

[1] www.asean.org
[2] www.aseanstats.org

of the RER." The scepticism of the relationship of trade liberalization via tariff reduction was also expressed by Edwards (1987a) : "in the case of tariffs reduction it is not possible to know a priori whether the equilibrium RER will appreciate or depreciate."

Empirically, the effect of liberalization via tariff reduction may lead to depreciation of real exchange rate as in Head & Ries (1999), Jimoh (2006), and Insaidoo & Obeng (2008). On the other hand, there is no empirical evidence showing the effect via the change of terms of trade on RER. The hypothesis regarding with the latter effect thus may be only be based on the above theoretical finding by Edwards (1987b), Gregorio & Wolf (1994) and Mendoza (1995).

- 3) Theoritically, consumption may lead to appreciating RER (Mankiw, 2012) or depreciating RER (Ravn, 2012).

Empirically, increased consumption will lead to depreciating real exchange rate and vice versa (see Devereux and Hnatkovska, 2011), although according to Lin (1996) consumption is not a fundamental exogenous variable.

- 4) There are large differences in terms of country's level of income with Japan having the highest GDP per capita US$ 46,720 (current, 2012) and GNI per capita 36,300 (current, 2012); while Cambodia having the lowest GDP per capita US$ 944 (current, 2012) and GNI per capita 2,330 (current, 2012). It is expected that the RER movement of seven ASEAN+6 countries would be different between the two groups – high income and middle-low income countries. The groupings refer to World Bank classification (July 2012) with high income countries have GNI per capita $12,476 or more, while middle and low income countries have GNI per capita less than $12,476.
- 5) The observed period 2000 – 2011 covers a period when subprime mortgage crisis 2008 took place. The crisis effect influenced global and regional trade up to at least 2010. Despite the fact, as having much learned the lesson from Asian economic crisis 1997/98, prudential macroeconomic policy has been adopted by ASEAN+6 countries (including those seven countries) and this has made the scale of crisis in ASEAN+6 region was much less severe compared with US and Europe.

Subsequently, 2008-2010 period was considered crisis period since in the period the economic growth slowed down; even there were some of those seven ASEAN+6 countries (e.g. Singapore and Japan) experienced a recession during the time period. The crisis period was also marked by the slump in ASEAN+6 countries exports. The countries dependent on exports in promoting economic growth such as Singapore and Japan have suffered much. Therefore it is expected that the RER movement of the seven ASEAN+6 countries would be different between crisis period and normal period. The main model employed to examine the relationship between a set of exogenous variables and one endogenous variable are panel data regression model. The formulated equations are in a log-linear model.

$$LRER_{it} = \propto + \beta_1 Tariff_{it} + \beta_2 LToT_{it} + \beta_3 LCon_{it} + \beta_4 D1_{it} + \beta_5 D2_{it} + e_{it} \quad \ldots\ldots(1)$$

For the purpose of comparison, another econometric panel data model excluding crisis period 2008-2010 will also be computed. Thus, dummy crisis period variable will not be employed in the model. The model is formulated as follows :

$$LRER_{it} = \propto + \beta_1 Tariff_{it} + \beta_2 LToT_{it} + \beta_3 LCon_{it} + \beta_4 D1_{it} + e_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots(2)$$

Another model for comparison is an econometric panel data model without dummy variables at all as follows :

$$LRER_{it} = \propto + \beta_1 Tariff_{it} + \beta_2 LToT_{it} + \beta_3 LCon_{it} + e_{it} \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(3)$$

where (for all models)

$LRER_{it}$	=	Log Real Exchange Rate Country *i* Year *t*
$Tariff_{it}$	=	Tariff Rate Country *i* Year *t*
$LToT_{it}$	=	Log Terms of Trade Country *i* Year *t*
$LCon_{it}$	=	Log Consumption Country *i* Year *t*
$D1_{it}$	=	Dummy Country's Level of Income (1 for high income country, 0 for low and middle income country)
$D2_{it}$	=	Dummy Crisis Period (1 for crisis period, 0 for normal period)

The models demonstrate the existence of trade, fiscal, and monetary sector policy which may affect exchange rate. Trade liberalization via tariff and terms of trade is a measure involving policy discretion in trade sector

which is in the domain of trade sector and fiscal sector policymakers. Consumption is an important economic indicator closely related with tax, excise, export and import duties collection discretion which are in fiscal sector policymakers' domain. While RER is a crucial indicator for monetary stability, a discretion area for monetary sector policymakers. All the above mentioned variables which act as a policy mix play an important role in shaping each country's economy condition.

4. Results and Discussion

Prior to investigating the relationship of a set of endogenous variables on exchange change rate of the seven ASEAN+6 countries using panel data model approach, let us have a look at the trend of each variable in the graphs. The trend of model variables during 2000 – 2011 period indicated in average RER of the seven ASEAN+6 countries tended to appreciate, tariff rate was inclined to decline, terms of trade tended to improve, while consumption was inclined to increase (see figures 3, 4, 5, and 6 in Appendix). In terms of real exchange rate, all seven sample countries but Japan have had currency appreciation during observation period 2000-2011, with the highest was China (54%) and the lowest was Malaysia (4%). Regarding with tariff rate, all seven sample countries have lowering tariff rate, except Singapore which has applied zero tariff rate since 2000. The highest decrease happened in China. In the case of terms of trade index, four of the seven countries have faced lowering index; nonetheless, the level of decrease was much less than the level of index increase. Australia has double increase in the index. This region has recorded impressive consumption growth during observation period. In the sample countries, Malaysia recorded the highest (94%) followed by China (92%), and Japan recorded the lowest (12%). In the population, Vietnam ranked the highest (114%) followed by India (108%), and Korea became the lowest (48%).

Among the three models displayed in the first, second, and third equation, the first model under 10% confidence level (see table 1) and the second model under 5% confidence level (see table 5) have shown the best estimators. The second model has lower adjusted R2 and F-test than the first model; however the second one has better t-test than the first one. Since in the first model the t-test of D2 is just slight above 5% and the model has better F-test while covers more variables, the first model is still better than the second one. While the third model (see table 6) should be ignored since the relationship shown in *TARIF* variable (minus sign) is contrary with the data relationship displayed in fig. 3 and fig. 4. From Hausman test to select among the three options of the first model: pooled ordinary least square (OLS), fixed effect model (FEM), or random effect model (REM), I found out that REM gave the best estimators (see table 1, table 2, table 3, and table 4 for comparison). Since the estimated chi-square value is highly statistically insignificant, the hypothesis that there is significant difference in the estimated coefficients of the FEM and REM is accepted. It seems there is no correlation between the error term and one or more regressors. Hence, the random effects model as shown in table 1 can be accepted instead of fixed effect model shown in table 3 (see Gujarati & Porter, 2009).

Table 1: Panel Data Model Output - Random Effect

Dependent Variable: LRER
Method: Panel EGLS (Cross-section random effects)
Date: 07/08/13 Time: 17:33
Sample: 2000 2011
Periods included: 12
Cross-sections included: 7
Total panel (balanced) observations: 84
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.325246	0.198105	6.689627	0.0000
TARIF	-0.006420	0.002468	-2.601472	0.0111
LTOT	0.196383	0.055799	3.519446	0.0007
LCON	0.033162	0.013331	2.487581	0.0150
D1	-0.092121	0.022140	-4.160912	0.0001
D2	0.017253	0.008965	1.924477	0.0579

Effects Specification	S.D.	Rho
Cross-section random	0.020969	0.2778
Idiosyncratic random	0.033809	0.7222

Weighted Statistics			
R-squared	0.251131	Mean dependent var	0.848737
Adjusted R-squared	0.203126	S.D. dependent var	0.042383
S.E. of regression	0.037834	Sum squared resid	0.111650
F-statistic	5.231403	Durbin-Watson stat	0.504172
Prob(F-statistic)	0.000341		

Unweighted Statistics			
R-squared	0.309896	Mean dependent var	2.011350
Sum squared resid	0.152427	Durbin-Watson stat	0.369299

The result examining the overall model indicates significantly the effect of endogenous variables on exogenous variable (see Table 1). The model can explain 20.3% of the variability between the response data around its mean. However, since the purpose of this study is to find and interpret the relationship between the endogenous variable and exogenous variables, it is irrelevant to use the lower goodness of fit measure to see whether it is a good model or not. In that regard, F-test and t-test are the relevant measures. The F-test indicates the model is collectively robust, and the t-test shows that individual exogenous variables have significant effect on the endogenous variable. It shows that altogether and invidually, trade liberalization (via tariff and terms of trade), consumption, country's level of income, and crisis period affect real exchange rate significantly under 5% level of confidence, except crisis period which is slightly above 5% level of confidence, thus far under 10% level of confidence. Thus, it supports hypothesis 1.

Trade Liberalization and RER: This section discusses hypothesis 2. Trade liberalization can be measured by the change in tariff and terms of trade. The model results in negative relationship between trade liberalization via tariff on RER and positive relationship between trade liberalization via terms of trade on RER. In other words, the empirical finding shows that tariff reduction leads to appreciating RER, but tariff increase leads to depreciating RER. The increased terms of trade induces appreciating RER, while the decreased terms of trade induces depreciating RER. The t-test indicates significant relationship of tariff and terms of trade on RER under 5% level of confidence. β_1 coefficient suggests that RER appreciates at the rate 0.642 percent of tariff reduction. Subsequently, β_2 coefficient shows that 1% increase in terms of trade will lead to 0.196 percent of RER appreciation. The empirical finding on the negative relationship between trade liberalization via tariff on RER in seven ASEAN+6 countries in my study is in contrast with the empirical positive relationship of those two variables above in Head & Ries (1999) for Canada case, Insaidoo & Obeng (2008) for Ghana case, and Jimoh (2006) for Nigeria case. In comparison with the theoritical reference, the result of my study resists the theory in the first mainstream (traditional policy literature and Tokarick (1995)). Yet, it supports the third mainstream theory proposed by Edwards (1987a; 1987b) which concluded the scepticism of a universal relationship of trade liberalization via tariff reduction on exchange rate and relied more in case by case basis.

Subsequently, the result of positive relationship of trade liberalization through terms of trade in my study is in line with theoretical finding in Gregorio & Wolf (1994) and Mendoza (1995) from the second mainstream theory which concluded trade liberalization through terms of trade improvement will induce appreciating RER. The empirical finding of my study may also be interpreted to support the proposed theory in Edwards (1987a; 1987b) from the third mainstream theory; which concluded case by case basis relationship. Both tariff reduction and terms of trade increase have been the trade policy adopted by the relevant policymakers in the seven ASEAN+6 countries. Trade liberalization policy through tariff reduction in the seven ASEAN+6 countries has appreciated their currency, while through terms of trade improvement has appreciated their currency as well. We may not forget that characteristics of the ASEAN+6 region including those seven countries– which was among others facing trade surplus situation in the observation period – may provide the background to the two-variable relationship. Trade liberalization policy adopted in ASEAN countries together with their partner developed countries in Asian and Australian regions have been commonly mixed with foreign direct investment promotion, because ASEAN have long pursued outward-oriented trade and FDI policies since the 1980s in cooperation with their neighboring and more developed partners. The policies have been one of the main engines of rapid economic growth and development in the countries. Internally through ASEAN Trade in Goods Agreement (ATIGA), main ASEAN countries have eliminated intra-ASEAN import duties on 99.65 percent of their tariff lines, while LDCs in ASEAN have reduced their import duties to 0-5 percent on 98.86 percent of their tariff lines.[3] In 2014, the average ATIGA rate stood at just 0.04% for the ASEAN-6 (declining from 4.44% in 2007), and 0.54% average for all AMS (declining from 2.58% in 2007).[4] At the same time, ASEAN has also made steady progress on its external integration with their partners in the rest of Asia and the world.[5] By liberalizing their trade and FDI regimes, ASEAN countries have successfully joined the region's supply chains led by their developed partner countries in ASEAN+6 regional forum.

[3] See ASEAN Secretariat http://investasean.asean.org
[4] See ASEAN Integration Report 2015.
[5] Kawai and Naknoi (2015).

Consumption and RER: *Empirical finding on the relationship of consumption and RER indicates positive relationship, which supports theoretical finding in hypothesis 3*. The t-test under 5% level of confidence shows significantly that increasing consumption induces appreciating RER. β_3 coefficient indicates that 1% increase of consumption impacts on 0.033% RER appreciation. This relationship finding is in contrast with Devereux & Hnatkovska (2011). The significant relationship result is also contrary with Lin (1996) which shows that consumption is not a fundamental exogenous variable. Theoritically, the finding of my study is in line with the literature theory in Mankiw (2012) and contrary with Ravn (2012). Macroeconomics theory in open economies (e.g. in Mankiw (2012)) can be utilized to develop solid arguments of the empirical finding on the third hypothesis test of relationship between consumption and exchange rate, as explained in interconnecting model in financial market, capital outflow, and foreign currency market (see figure 2). In trade surplus situation commonly found in ASEAN+6 countries (see figure 1), net exports NX is above zero; thus Y = C + I + G + NX will be higher than domestic spending C + I + G and saving S = Y – C - G is higher than investment I. Significant increase in consumption C in S = Y – C - G will decrease saving S (assuming other factors constant), and decrease loanable funds availabe in financial market; thus supply curve of loanable funds shifts from S1 to S2. The decreased loanable funds will raise real interest rate from r1 to r2, which result in decreased net capital outflow NCO from n1 to n2. The lowering NCO will result in less supply of relevant local currency to exchange with foreign currency, thus cause appreciating RER.

The evidence of positive relationship of consumption and RER in my study may indicate the existence of Backus-Smith anomaly as described in Devereux & Hnatkovska (2011) and Corsetti, Dedola, & Leduc (2008). Devereux & Hnatkovska (2011) argued that the evidence may show the existence of the joint role of incomplete markets and shocks which generate strong income effects as proposed in resolutions of the Backus-Smith anomaly. "The intuition is that a country which has a faster growing consumption experiences an appreciating real exchange rate". China and India are good examples of those seven ASEAN+6 countries with faster growing consumption and surely there are a few more. With their remarkable growth and the advantage of their enormous population - as those three nations ranked the first (1.34 billion), the second (1.24 billion), and the fourth (242 million) of the most populous nations in the world - their fast growing consumption may create significant magnitude for increased consumption in ASEAN+6 region. Especially, crisis period 2008-2010 has made Asia and ASEAN+6 a new global engine of growth with faster growing consumption compared with previous few decades. In addition, Corsetti, Dedola, & Leduc (2008) explained further "strong wealth effects in response to shocks raise the demand for domestic goods above supply, crowding out external demand and appreciating the terms of trade and the real exchange rate."

Level of Country's Income and Crisis Period: *The model output in level of country's income dummy shows that the country's level of income negatively affects RER, which supports hypothesis 4.* From t-test under 5% level of confidence, the level of income disparities among the seven ASEAN+6 countries influences RER significantly. It is noted that several countries such as Japan, Australia, New Zealand, South Korea, and Singapore are grouped into higher income countries, while other countries are classified into the middle and low income countries group. The rate of relative change of RER for high income countries in average is 0.092 % (β_3 value=-0.092) lower than middle and low income countries. This figure suggests that middle and low income countries experience appreciation or depreciation more quickly than high income countries (amounting 0.092 unit RER more per RER value). In other words, currency value of high income countries is relatively more stable in comparison with middle and low income countries. More stable economic structure and financial sector in high income countries which are notably developed or new industrial countries play important role in this matter.

Crisis period dummy shows the opposite positive sign, dissimilar to level of country's income dummy. The t-statistic = 0.0579 is slightly above 5% level of confidence, and as a consequence statistically this figure can still be accepted under 10% level of confidence. The resulted t-statistic indicates significant relationship that crisis period 2008-2010 affected the RER of the seven ASEAN+6 countries, which supports hypothesis 5. The β_4 value output indicates that the rate of relative change of RER during crisis period 2008-2010 in average is 0.017 percent higher than normal period. It suggests that during the crisis period, the seven ASEAN+6 countries experienced appreciation or depreciation more quickly than in normal times. Implicitly, the currency value of the seven ASEAN+6 countries is relatively more volatile in the crisis period compared with normal times. The result does make sense since during turbulence period, global economy commonly poses

much more uncertainties and information asymetries which subsequently increase risk perception among businesses players. It is reflected to some degree by the abrupt capital inflows and outflows - mainly from portfolio investment - in this region during turbulence period.

Policy Implications: This study covers seven ASEAN+6 countries (Australia, China, Japan, Malaysia, New Zealand, Philippines, and Singapore), which during observation period together with the rest of ASEAN+6 countries have enjoyed trade surplus. The region has successfully improved the regional value chain and increased the productivity with Japan, China, Korea, and Singapore serve as final product exporters. The models employed in this study portray fiscal, monetary, and trade policy linkages. Basically, coordination and policy mix among fiscal, monetary, and trade regulators should be maintained appropriately. Therefore, it is necessary to understand the impact of a particular domestic policy to local currency. A policy with direct or indirect impact to lowering tariff, increased terms of trade index, and increased consumption will induce local currency appreciation in the seven ASEAN+6 countries. And the opposite applies; a policy issued with direct or indirect impact to increasing tariff, decreased terms of trade index, and decreased consumption will induce local currency depreciation in the seven ASEAN+6 countries. The policy mix should be maintained and coordinated appropriately to prevent from drastic local currency appreciation or depreciation; a situation which will impede export import activities, business plan, and economy as a whole in the end. The adverse impact of drastic local currency appreciation or depreciation will be worse especially for the ASEAN+6 developing countries every time and for all seven ASEAN+6 countries during economic turbulence.

From macroeconomics perspective, a country's currency appreciating too much without adequate economic fundamentals support will create unbalanced macroeconomic situation in the long run, marked with over demand of import commodity in domestic market and oversupply of export commodity in international market. At particular point of time during the appreciation, if the shock is managed appropriately the appreciation will stop and the currency will reach a new equilibrium level. However, if managed inappropriately the balance of payment will suffer. Adverse impact will take place as well in drastic depreciation. From policymakers' perspective - to 'tame' the shock and to maintain steady and sustainable economic growth - fiscal sector policymakers may adjust relevant policy instruments e.g., imposing or releasing tax, tariff, export and import duties adjustment. On the other hand, in the short-term monetary sector policymakers may adjust the policy instruments e.g., by tightening or relaxing monetary policy mainly through interest rate instrument to ensure steady and stable economic growth. Trade sector policymakers may contribute to economic growth and stabilization e.g., by tightening or relaxing export import barriers in cooperation with fiscal sector policymakers. The less currency stability characteristic which the ASEAN+6 developing countries have in comparison with developed ones should prompt the respective government to be more prudent in adopting macroeconomic policy; which is beneficial to hinder any economic turbulence. It applies not only during crisis but also during normal times. Therefore, learning the lessons from Asian economic crisis 1997/1998, many Asian countries including ASEAN+6 countries (both developed and developing ones) have a tendency to accumulate high level of reserve currency as buffer to protect their economy from adverse external shocks.

5. Conclusion

Trade liberalization has been mushrooming in the globalization era. The trade liberalization policy adoption by one country will be followed shortly by another. Although trade liberalization policy is strongly advocated by international organizations, a few prominent economists argue there is no 'one fits for all' policy, including in this regard, trade liberalization. Thus, the policy effect altogether with other relevant aspects still needs to be explored in case by case basis, including ASEAN+6 region. The empirical evidence resulted from the log-linear model with data panel approach employed in this study shows significant effect of trade liberalization via tariff and terms of trade, consumption, level of country's income, and crisis period altogether and individually on real exchange rate. Trade liberalization policy in the seven ASEAN+6 countries through both tariff reduction and terms of trade improvement has appreciated their currency. The trade surplus characteristic of ASEAN+6 countries, including those seven countries in the observation period may provide the background for the two-variable relationship. The empirical evidence related with tariff supports the theory proposed by Edwards (1987a; 1987b) which concluded the scepticism of a universal relationship of trade liberalization via tariff reduction on exchange rate and relied more in case by case basis. In relation with

terms of trade, the empirical evidence may agree not only with the 'skepticism' theory proposed by Edwards (1987a; 1987b), but also with the theory proposed by Gregorio & Wolf (1994) and Mendoza (1995) which concluded trade liberalization through terms of trade improvement will induce appreciating RER. This study contributes empirical evidence to the latter theory.

Empirical finding on the relationship of consumption and RER indicates significantly that increasing consumption induces appreciating RER, which is in contrast with Devereux & Hnatkovska (2011). Different with Lin (1996), this study shows consumption is a significant variable affecting real exchange rate. The finding of this study is in line with the literature theory in Mankiw (2012) and contrary with Ravn (2012). The log-linear model output shows that the country's level of income affects RER. Middle and low income countries significantly experience appreciation or depreciation more quickly than high income countries, which suggests the higher currency stability of high income countries have in comparison with middle and low income countries. Crisis also affects RER as this study finds that during crisis period 2008-2010, the seven ASEAN+6 countries significantly experience appreciation or depreciation more quickly than in normal times. It reflects more volatile RER during crisis period in comparison with normal times. This study is expected to result a better and more comprehensive conclusion if the terms of trade and real exchange rate data could be disclosed before year 2000 and all ASEAN+6 countries relevant data could be provided. Other factors impact suitable with Edwards (1987c) and Mussa (1984) e.g. government spending, capital inflow and outflow, surplus and deficit trade balance on real exchange rate have not been investigated yet and and may trigger a challenge for further studies.

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APPENDICES

Table 2: Pooled OLS Model

Dependent Variable: LRER
Method: Panel Least Squares
Date: 02/25/14 Time: 10:15
Sample: 2000 2011
Periods included: 12
Cross-sections included: 7
Total panel (balanced) observations: 84

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.579346	0.159109	9.926196	0.0000
TARIF	-0.010093	0.002430	-4.154089	0.0001
LTOT	0.097952	0.054992	1.781202	0.0788
LCON	0.030286	0.008271	3.661843	0.0005
D1	-0.103821	0.016770	-6.191041	0.0000
D2	0.012254	0.010772	1.137606	0.2588

R-squared	0.388816	Mean dependent var	2.011350
Adjusted R-squared	0.349637	S.D. dependent var	0.051586
S.E. of regression	0.041602	Akaike info criterion	-3.452599
Sum squared resid	0.134995	Schwarz criterion	-3.278969
Log likelihood	151.0091	Hannan-Quinn criter.	-3.382801
F-statistic	9.924210	Durbin-Watson stat	0.417835
Prob(F-statistic)	0.000000		

Table 3: Fixed Effect Model

Dependent Variable: LRER
Method: Panel Least Squares
Date: 02/25/14 Time: 10:53
Sample: 2000 2011
Periods included: 12
Cross-sections included: 7
Total panel (balanced) observations: 84
WARNING: estimated coefficient covariance matrix is of reduced rank

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.491979	0.958431	-2.600060	0.0113
TARIF	0.004211	0.003395	1.240340	0.2188
LTOT	0.289307	0.061579	4.698161	0.0000
LCON	0.344346	0.081505	4.224826	0.0001
D1	NA	NA	NA	NA
D2	0.004041	0.010074	0.401094	0.6895

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.622222	Mean dependent var	2.011350
Adjusted R-squared	0.570472	S.D. dependent var	0.051586
S.E. of regression	0.033809	Akaike info criterion	-3.814644
Sum squared resid	0.083442	Schwarz criterion	-3.496323
Log likelihood	171.2151	Hannan-Quinn criter.	-3.686682
F-statistic	12.02354	Durbin-Watson stat	0.587437
Prob(F-statistic)	0.000000		

Table 4: Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	4	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
TARIF	0.004211	-0.006420	0.000005	0.0000
LTOT	0.289307	0.196383	0.000678	0.0004
LCON	0.344346	0.033162	0.006465	0.0001
D2	0.004041	0.017253	0.000021	0.0040

Table 5: Random Effect Model (Crisis Period excluded)

Dependent Variable: LRER
Method: Panel EGLS (Cross-section random effects)
Date: 02/26/14 Time: 09:00
Sample: 2000 2011
Periods included: 9
Cross-sections included: 7
Total panel (balanced) observations: 63
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.256254	0.209438	5.998212	0.0000
TARIF	-0.007199	0.002544	-2.829785	0.0064
LTOT	0.230339	0.070672	3.259256	0.0019
LCON	0.033638	0.012121	2.775095	0.0074
D1	-0.091952	0.021287	-4.319714	0.0001

Effects Specification

	S.D.	Rho
Cross-section random	0.016709	0.1863
Idiosyncratic random	0.034926	0.8137

Weighted Statistics

R-squared	0.231517	Mean dependent var	1.146541
Adjusted R-squared	0.178518	S.D. dependent var	0.045705
S.E. of regression	0.041425	Sum squared resid	0.099530
F-statistic	4.368332	Durbin-Watson stat	0.592754
Prob(F-statistic)	0.003721		

Unweighted Statistics

R-squared	0.293174	Mean dependent var	2.005644
Sum squared resid	0.121590	Durbin-Watson stat	0.515515

Table 6: Fixed Effect Model (no dummy variables)

Dependent Variable: LRER
Method: Panel Least Squares
Date: 02/26/14 Time: 09:40
Sample: 2000 2011
Periods included: 9
Cross-sections included: 7
Total panel (balanced) observations: 63

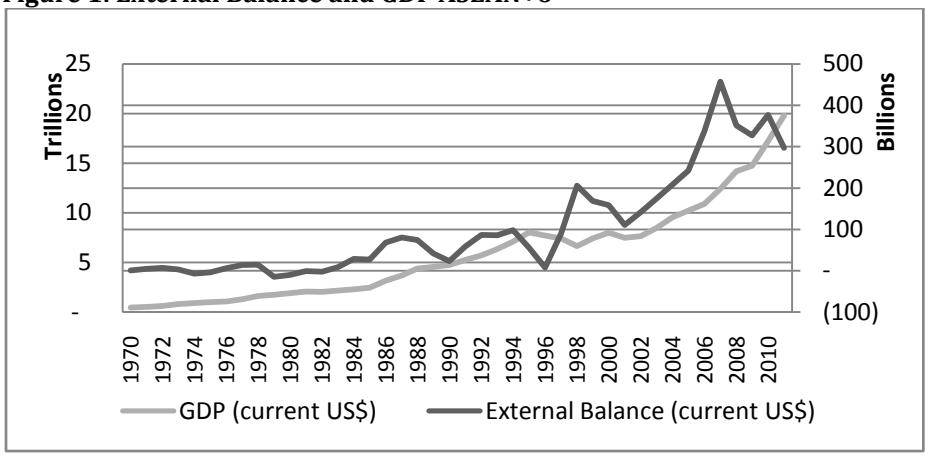
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3.314891	1.094019	-3.030013	0.0038
TARIF	0.006493	0.003846	1.688167	0.0973
LTOT	0.374342	0.078492	4.769157	0.0000
LCON	0.401020	0.092281	4.345641	0.0001

Effects Specification

Cross-section fixed (dummy variables)

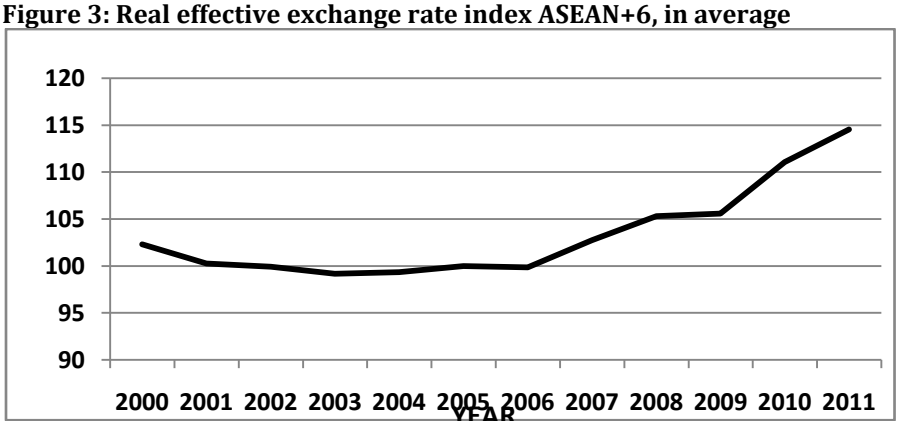
R-squared	0.624182	Mean dependent var	2.005644
Adjusted R-squared	0.560364	S.D. dependent var	0.052674
S.E. of regression	0.034926	Akaike info criterion	-3.726576
Sum squared resid	0.064649	Schwarz criterion	-3.386396
Log likelihood	127.3871	Hannan-Quinn criter.	-3.592782
F-statistic	9.780626	Durbin-Watson stat	0.718575
Prob(F-statistic)	0.000000		

Figure 1: External Balance and GDP ASEAN+6



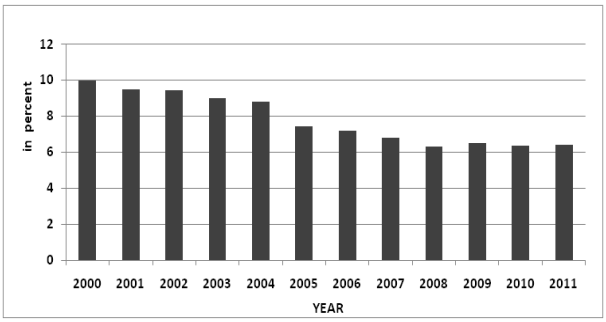
Source: World Bank (2013)

Figure 3: Real effective exchange rate index ASEAN+6, in average



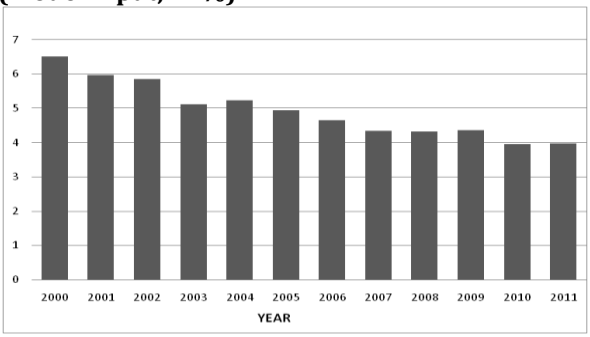
Source: World Bank (2013)

Fig. 4(a).Tariff rate ASEAN+6, in average



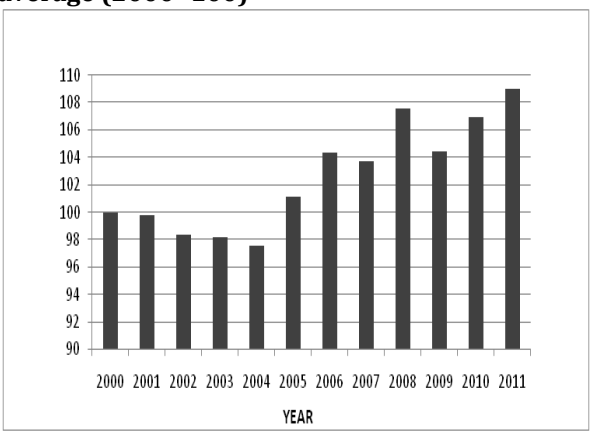
Source : World Bank (2013)

Fig. 4(b).Average tariff rate (model input, in %)



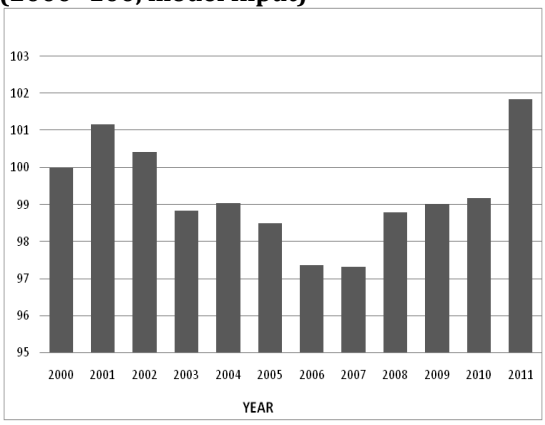
Source : World Bank (2013)

Fig. 5(a). Terms of trade index ASEAN+6, in average (2000=100)



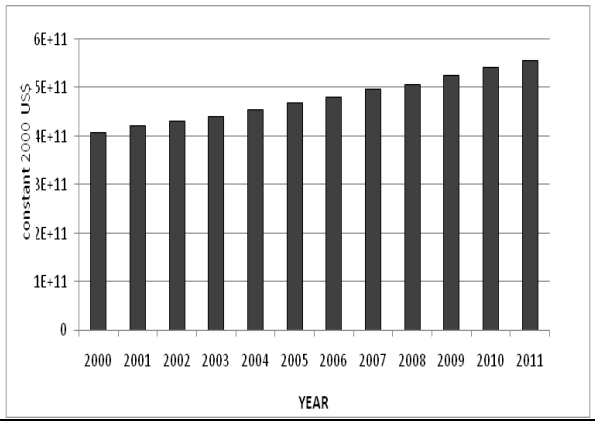
Source : World Bank (2013)

Fig. 5(b). Terms of Trade Index, in average (2000=100, model input)



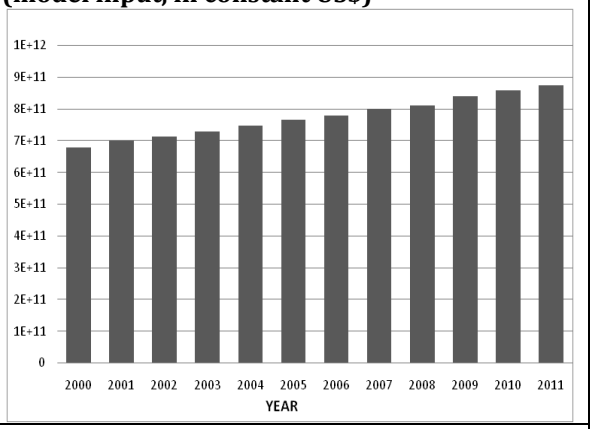
Source : World Bank (2013)

Fig. 6(a). Average Consumption (ASEAN +6)



Source : World Bank (2013)

Fig. 6(b). Average consumption (model input, in constant US$)



Source : World Bank (2013)