



Munich Personal RePEc Archive

# **Non-Tariff Barriers and Their Effect on Export: Evidence from 5 ASEAN Countries**

Chin, Lee and Yousefi, Abdolaziz

School of Business and Economics, Universiti Putra Malaysia

2017

Online at <https://mpra.ub.uni-muenchen.de/118781/>  
MPRA Paper No. 118781, posted 14 Oct 2023 07:16 UTC

*“This is an Accepted Manuscript of an article published in **International Journal of Economics and Financial Management** on 2017, available online: <http://www.ijefm.in/current.php>”*

**Lee Chin** and Yousefi, A. (2017). Non-Tariff Barriers and Their Effect on Export: Evidence from 5 ASEAN Countries, *International Journal of Economics and Financial Management*, 1(1), 46-57.

# NON-TARIFF BARRIERS AND THEIR EFFECT ON EXPORT: EVIDENCE FROM 5 ASEAN COUNTRIES

**Lee Chin<sup>1</sup>**

*Department of Economics, Faculty of Economics and Management,  
Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia*

E-mail: [leechin@upm.edu.my](mailto:leechin@upm.edu.my)

**Abdolaziz Yousefi**

*International Cooperation Department,  
I. R. Iran Customs Administration (IRICA), Tehran, Iran  
Graduated from Universiti Putra Malaysia*

Email: [yousefi\\_aziz@yahoo.com](mailto:yousefi_aziz@yahoo.com)

## **Abstract**

Protection or trade restriction in a country comes at an economic cost to domestic consumers and short run benefit to producers of the country. Tariff and non-tariff barriers (NTBs) are government policies to protect domestic producers from foreign competition. Reduction or elimination of trade barriers will increase trade activities in an economy. This study used the autoregressive distributed lag (ARDL) approach to show that elimination of NTBs will increase export of 5 ASEAN members. Results indicate that Indonesia, Philippines, and Singapore enjoyed an increase in export by reduction in NTB level after implementation of AFTA. This implied that reduction in NTB level will promote export activities.

## **1. Introduction**

One of the governments' oldest economic policies is restrictions on international trade. But under GATT (General Agreement on Tariffs and Trade) and WTO (World Trade Organization), we can find series of elimination and/or reduction in trade restrictions. As countries have decreased tariff rates under the auspices of WTO, the NTBs have become more prominent, and are used more frequently. Weil (2009) stated that average tariff rates in the developed countries fell from 40% in 1945 to 6% by 2000; average tariff in

---

<sup>1</sup> Corresponding author. Lee Chin; Department of Economics, Universiti Putra Malaysia, 43400 UPM, Serdang, Selangor Darul Ehsan, Malaysia; Tel: +60 603 8946 7769; Fax: +60 603 – 8948 6188; e-mail: [leechin@upm.edu.my](mailto:leechin@upm.edu.my)

developing countries exceed 30%. NTBs are subjective and often have uncertain effects on price and quantity, and harder to analyse comparing to tariff barriers. They are an increasingly common form of protectionism. Coughlin and Wood (1989) demonstrated that, as a protection policy, NTBs are a way for re-distribution of wealth from consumers to selected producers. The benefit received by the selected producers is outweighed by the costs borne to the rest of the nation. The non-tariff barriers may ultimately injure the national economy in long-run. They provide protecting shield to even those under performing producers who are not competitive at all, hence wasting the country's resources and hurting consumers.

Trade as an engine of growth plays important role in the development of economies. Exports are thought to enhance efficiency by increasing competition among domestic producers. This aim is gained through exposure to global markets that prompt greater entrepreneurial efforts and forcing them to be more competitive and innovative. The NTBs as subjective measures hamper trade among nations and slowdown economic growth. So finding the effects of reducing of these barriers would help us to devise better policies and create a smooth flow of goods within and among countries. Tariff is a straightforward barrier to trade even if it is high in rate. But NTB is not very clearly defined by governments in most of the times. For example, obtaining various permissions, inefficient terminal handling and manual customs processing in ports and lengthy lab tests and consequently incurred delays, as well corruption and pilferage in public ware houses led to increase in prices of importing machinery, intermediate goods or raw material for production sector; so it is a loss of competitiveness for this sector comparing to rivals in global market. However, previous researches show that the impact of NTB on trade

especially on export is ambiguous (Otsuki *et al.*, 2001; Fontagne *et al.*, 2005; Iacovone, 2005; Gebrehiwet *et al.*, 2007 and Chen *et al.*, 2008). So the question raised is can reduction of NTB level increase export activities of economies?

The ASEAN Free Trade Area (AFTA) was established in January 1992 to eliminate the tariff barriers among the Southeast Asian countries with a view to integrating the ASEAN economies into a single production base and creating regional market. The Agreement on the Common Effective Preferential Tariff (CEPT) Scheme for the AFTA requires that tariff levied on a wide range products traded within the region reduced to no more than 5%. Quantitative restrictions and other non-tariff barriers are also to be eliminated. Therefore, this study aims to investigate whether reduction of NTBs after the implementation of AFTA has increase export activities in ASEAN?

## **2. Literature Review**

Plenty of trade agreements bilaterally and multilaterally signed among nations that have led to low or zero tariffs, but a great deal of NTBs to protect national industries and products emerged subsequently. Protection of an industry brings about gains for some, and losses for many others. Comparative advantage considered as the foundation of international trade. Nations and businesses that ignore their comparative advantage more likely will be less efficient (Ma, 2011). In order to protect industrialists and rent-seekers interests' sometimes policy makers and particularly bureaucrats have intention to impose high levels of NTBs. This issue destroys competitive environment in a nation and weakens the competitiveness of its economy (Kaihatu, 2003).

Weil (2009) states international trade can increase the level of investment and output. Sachs and Warner (1995), Wacziarg and Welch (2003) suggested that the more open to the world economy the countries are; the more likely they are to be rich. Weil (2009) shows that there is opposition to openness. The opposing parties are the self-interest of firms or workers in a particular industry; the owners of factors of production that will become relatively less scarce if protection is removed.

Canlas (2009) reports that the underlying logic of the GATT is based on the theory of comparative advantage, which was developed by David Ricardo in the early 19th century. This theory says that all nations can benefit from free trade. Efficiency and output will be increased by producers that concentrating their resources in areas where they enjoy advantage in relation to their competitors. Conversely, where governments want to protect domestic producers from foreign competition by using trade barriers to distort prices, the less efficient and high costly industries will flourish at the expense of domestic consumers and global economic growth. In recent years, non-tariff measures have also been increasing such as the ban on certain importation for health and environmental reasons.

Daumal and Özyurt (2011) state that, openness to trade or reduction of trade barriers can improve productivity of a nation through a competition effect. Exposure to international competition can make companies to increase their efficiency (through a better allocation of its resources, lower costs, improvements in managerial and organizational efficiency, etc.). Roe (2004) supported free trade rarely accounts for negative growth in long run. Countries can benefit from globalization, but the process is linked to institutional change

and increased openness. Rate of growth in export and control of corruption as an NTB is positively related.

De (2006) showed that 10% reduction in transport costs which is expressed as ad valorem tariff equivalent would boost trade in Asia by 3-4%. Winkelmann and Winkelmann (1997) opined that with market power in foreign supply, setting a restrictive NTB will induce foreign suppliers to raise prices on their supplies. NTBs increased the mark-up prices of US exporters to New Zealand. Jakubiak, *et.al* (2006) stated that reduction of NTBs is beneficiary for producers, and elimination of NTBs, especially through harmonization of standards leads to significant welfare gains.

Beghin (2006) states that as of 2005, the unweighted average tariff is roughly 3% in high-income nations and 11% in developing countries. As tariffs rates have been decreased, demands for protectionism have induced more NTBs. The United Nations Conference on Trade and Development (UNCTAD, 2005) estimates the use of NTBs other than quantity and price controls and finance measures increased from 55% of all NTB measures in 1994 to 85% in 2004. This shows that use of TBT (Technical Barriers to Trade) almost doubled, from 32% to 59% of affected tariff lines during the same period. NTB measurement is an essential step in estimation of welfare effects of the NTBs. Beyond welfare effects; these measures are also useful for policy making purposes. The WTO disputes frequently arise alleging that some NTBs hamper trade activities more than necessary to achieve some legitimate objective or that they are just for protectionists.

Chemingui and Dessus (2008) suggested that in Syria NTB increased the domestic price of imported goods by 17% on average. If the government removes NTB, trade policy can become the central instrument to redress Syria's growth prospects. The empirical results suggested that reduction of NTBs could have sizeable long term effects on trade volumes, domestic activity and welfare. Besides, Huy and Daquila (2003) stated that trade is the lifeblood of Singapore. Without trade, Singapore could have not become the active and wealthy economy today. As a free trader and vocal champion of free trade, Singapore has supported the promotion of free and open trade at the multilateral level through the WTO and at the regional level through ASEAN.

Otsuki *et al.* (2001), Fontagne *et al.* (2005), Iacovone (2005), and Gebrehiwet *et al.* (2007) discover a negative impact of standards on the trade of fresh and processed foods. In addition, Chen *et al.* (2006) firm-level study has shown that technical regulations reduce firms' export propensity of mainly domestically owned and agricultural firms in developing countries. The positive impact of NTBs on trade is also gaining wider empirical support with recognition of the competitive repositioning of some sectors facing stringent standards and regulations in importing countries (Jaffee and Henson 2004). Jaffee and Henson (2004) illustrate the success of Kenyan exporters of fresh produce that have complied with the EU requirements and thus improved their access to these markets and the Peruvian exporters of asparagus who have reached the strict EurepGAP (Good Agricultural Practice, renamed as Global GAP) protocol and have benefited as a result. A recent study by Chen *et al.* (2008) indicate that quality standards and labelling requirements are positively correlated with export volume and export scope (measured by



number of export markets and products), whilst the opposite holds true for certification procedures.

### **3. METHODOLOGY**

#### **3.1. Theoretical framework**

The analytical framework for this study was derived from Goldstein and Khan (1978)'s exports model. Goldstein and Khan (1978) proposed an exports model, which is derived from the supply and demand for exports. The model is expressed as:

$$\ln EX_t = \beta_0 + \beta_1 \ln RP_t + \beta_2 \ln Y_t + u_t \quad (1)$$

where  $\ln$  is the natural logarithm;  $EX$  is the export volume;  $RP$  is the relative prices;  $Y$  is the income of the importing country and  $u$  is a disturbance term.

For this study, the relative prices variable will be proxied by the exchange rates (REEX) and the income of the importing country will be proxied by Gross Domestic Product of World (GDP<sub>w</sub>). Furthermore, this study extended the Goldstein and Khan (1978)'s exports model by including the income of domestic country, inflows of foreign direct investment and NTB. Hence, equation (1) becomes:

$$\ln EX_t = \beta_0 + \beta_1 \ln REEX_t + \beta_2 \ln GDP_{it} + \beta_3 \ln GDP_{wt} + \beta_4 FDI_t + \beta_5 NTB_t + u_t \quad (2)$$

where REEX is the exchange rate;  $GDP_i$  is the income of the domestic country;  $GDP_w$  is the income of the importing country, FDI is inflows of foreign direct investment and NTB is non-tariff barriers.

It is expected that there is a negative relationship between EX and NTB and REEX; while GDP and FDI are positively related to EX. Theoretically, currency depreciation results in a lower relative price for these five countries' export products and it is expected to increase export of the countries. Since, this study use REER index where increasing in the index means currency is strengthening, thus the sign of REEX coefficients to be positive. However, the sign of REEX also depend on demand elasticity for export goods from these countries. The sign is expected to be positive, if the export demand is elastic. If the export demand of these five countries is inelastic, the signs are reverse. Export and GDP have positive relations, because growth in GDP will increase export volume. Export and FDI are positively related, as increase in FDI inflow will promote export activities.

Goldstein and Khan (1978) estimated the export function for eight industrial countries and found that the relative prices and the income of the importing country have a significant impact on exports. Similarly, O'Neill and Ross (1991) and Arize *et al.* (2000) reported that the relative prices and the income of the importing country are important for exports of Korea and thirteen developing countries, respectively. In addition, Arize (1990) reported that the relative price is statistically significant to exports in seven Asian developing countries. However, the world demand is found to be insignificant. Nevertheless, Hassan and Tufte (1998) found that exports of Bangladesh are affected by the volume of world trade as a measure of the income of the importing country.

The real exchange rate affects export volumes. Smith (2004) states that exchange rate affect both supply and demand for exports. A useful summary measure of the competitiveness is the real exchange rate, which is basically the nominal exchange rate multiplied by the ratio of domestic and foreign prices. The real exchange rate is the price of products relative to the price in other countries. Thus, an increase in real exchange rate means price of local products are higher than those sold overseas, and they are less competitive. Fang and Miller (2004) stated that according to a traditional view point depreciation of exchange rate would improve export. Using data of flexible exchange rate period shows depreciation increases export in developed nations. Export generally reacts increasingly to the depreciation of exchange rate. There is weak relationship between exchange rate depreciation and export in Singapore by using monthly data over period of 1979-2002. The paper suggests that Singapore can elicit stronger export growth by ensuring a more stable exchange rate rather than by engineering its depreciation.

In the analysis of FDI and exports, Clausing (2000) investigates US multinational corporations in 29 host countries and finds a strong positive influence of FDI on exports. Eaton and Tamura (1994) also analyse the relationship and find a strong complementary relationship. In contrast, Andersen and Hainaut (1998) find a complementary relationship for the USA, Japan, and Germany but not for the United Kingdom.

As a conclusion, protection of an industry will be in the benefit of some and loss for many others. This issue creates distortions in a country's resources, and spoils competitive environment in a nation. Protection can hurt national economies in long-run. Export also

reacts to the depreciation of exchange rate. An economy open to trade and capital with developed institutions helped to speed up long-run growth through increasing trade volume.

### **3.2. Methodology**

In this study, time series analysis used to investigate the effects of the NTB on export. So the variables in the model must be stationary. Using macroeconomic data at their levels may leads to serious econometric problems as time series data may have spurious regression, so the properties of the individual series have to be established first and this explains the essential of conducting unit root test before making any further assumption. Then the analysis will proceed with cointegration test by using ARDL approach which is known as the bound test that will show the existence of any short or long-run relationship between the variables.

#### **3.2.1. Unit root test**

The time series properties of each univariate series examined by unit root test of augmented Dickey-Fuller test (ADF) and Phillips-Perron test (PP) to check for stationary of a variable based on formal statistical tests. Due to the ARDL approach is not testable for  $I(2)$  variables the dependent variable must be in  $I(1)$ , therefore the unit root test to be conducted to check the order of integration for each variables. In ADF test, Schwartz's Bayesian Information (SIC) is utilized for lag length selection. On the other hand, KPSS test function applies in this analysis too, where it is useful for confirmatory analysis in conjunction with the ADF test. If both types of tests lead to the same conclusion, then there is a strong confidence in the outcomes.

### **3.2.2. ARDL approach**

We need to determine the order of cointegration of each variable. Pesaran *et. al.* (2000), and Pesaran and Shin (2002) introduced a new method of testing for cointegration which known as Autoregressive Distributive Lag (ARDL) bounds testing. There are advantages of using this approach since bounds test for cointegration does not depend on pre-testing the order of integration (Narayan, 2005) which means the test on the existence relationship between variables in levels is applicable irrespective of whether the underlying variables are purely  $I(0)$ ,  $I(1)$  or mixture of them.

### **3.3. Variables**

Export volume of 5 ASEAN member states namely Indonesia, Malaysia, Philippines, Singapore, and Thailand is the dependent variable. Gross Domestic Production (GDP), Real Effective Exchange Rate (REER), and Foreign Direct Investment (FDI) are the independent variables. NTB is a dummy variable in the model; and it is defined as 0 for the years after implementation of AFTA, and 1 for the years before implementation of AFTA in 1994.

### **3.4. Source of Data**

Data extracted from OECD, World Bank, IMF and UNCTAD for 5 leading countries of ASEAN namely Indonesia, Malaysia, Philippines, Singapore, and Thailand. ARDL Bounds Test Approach using Mfit4.1 employed to analyse the data. As ASEAN is an active economic region and not depends on oil exportation, except for Brunei and data availability we decided to choose the above 5 leading countries in the region.

## 4. RESULT AND DISCUSSION

### 4.1. Stationary tests

The Augmented Dicky-Fuller (ADF) unit root test and Phillips-Perron (PP) unit root test are employed in order to determine the order of integration of the time series under consideration (Table 4.1). ADF and PP tests indicate that the variables contain unit root which means that the time series data consists of non-stationary variables. According to the Table 4.1, the statistics failed to reject null hypothesis for all the series at level, except for a few cases in FDI and REEX for Malaysia, Philippine and Singapore. The ADF and PP test results for the first difference of series indicates that the null hypothesis could be rejected in all cases; and as the result series are I(1) or integrated at order one.

Table 4.1: ADF and PP Unit root test results

Country name	Variables	Level				First difference			
		PP		ADF		PP		ADF	
		Without trend	With trend	Without trend	With trend	Without trend	With trend	Without trend	With trend
Indonesia	EX	0.61	-2.14	0.39	-2.24	-6.59***	-6.86***	-6.59***	-6.85***
	GDP	-1.57	-1.9	-1.7	-2.02	-4.18***	-4.23**	-4.18***	-4.23**
	REEX	-2.04	-1.12	-2.04	-1.42	-6.6***	-7.31***	-6.56***	-7.08***
	FDI	-1.79	-2.31	-1.66	-2.18	-6.05***	-6.01***	-6.05***	-6.01***
Malaysia	EX	-1.43	-0.21	-1.51	-0.05	-4.63***	-4.94***	-4.63***	-4.96***
	GDP	-1.37	-1.41	-1.44	-1.21	-4.71***	-4.82***	-4.7***	-4.81***
	REEX	-0.95	-2.19	-0.95	-2.19	-5.13***	-5.06***	-5.14***	-5.07***
	FDI	-1.90	-3.25*	-2.07	-3.26*	-7.85***	-7.72***	-7.81***	-4.34**
Philippines	EX	-1.32	-3.19	-1.29	-3.19	-6.72***	-6.71***	-6.62***	-6.59***
	GDP	0.71	-1.1	2.38	-0.95	-3.18**	-3.11	-3.33**	-4.13**
	REEX	-1.85	-2.13	-1.76	-3.9**	-5.73***	-5.72***	-5.73***	-5.72***
	FDI	-2.28	-4.09**	-1.72	-4.09**	-15.85***	-16.67***	-8.3***	-8.17***
Singapore	EX	-1.76	-1.82	-1.70	-1.67	-4.84***	-5.02	-4.85***	-5.07***
	GDP	-1.62	-1.71	-1.55	-1.71	-5.14***	-5.32***	-5.14***	-5.34***
	REEX	-2.58	-2.3	-5.93***	-5.72***	-3.15**	-3.17	-3.25**	-3.26*
	FDI	-1.35	-4.52***	-0.98	-4.57***	-12.66***	-16.15***	-5.57***	-5.44***
Thailand	EX	-1.73	-0.59	-1.81	-0.39	-5.23***	-5.54***	-5.14***	-5.53***

	GDP	-2.09	-1.02	-1.61	-1.11	-3.3**	-3.63**	-3.31**	-3.63**
	REEX	-1.6	-1.23	-1.45	-0.75	-4.33***	-4.48***	-4.39***	-4.54***
	FDI	-1.47	-2.59	-1.37	-2.31	-7.59***	-7.6***	-6***	-2.92
World	GDP <sub>w</sub>	-2.05	-0.78	-2.2	-0.4	-4.07***	-4.28***	-4.13***	-4.46***

Note: The optimal lag length was selected automatically using the Schwarz information criteria (SIC) for ADF test and PPP test. \* Significance at 10% level, \*\* significance at 5% level and \*\*\* significance at 1% level.

## 4.2. ARDL Approach

There are three steps in ARDL approach which are ARDL cointegration bounds test, long run estimation and short run dynamics result. Given that all variables are found to be  $I(1)$ , the estimation is then proceed to the ARDL models for the estimation of existence of long run relationship between EX, NTB, GDP, REEX, and FDI. As the sample size is small that is from 1976 – 2011, the bound testing procedure is the most appropriate method to the long run effects of export with the NTB.

## 4.3. Short Run Coefficients

For the short-run analysis a linear combination of lagged level variables was calculated. This series is denoted by Error Correction Model ( $ECM_{t-1}$ ) in the model. The coefficient estimates of  $ECM_{t-1}$  are presented in Table 4.2. Using AIC and SBC, it was observed that these coefficients carry the expected negative sign and are significant in cases of all 5 countries and suggesting cointegration between variables. An alternative method for determining cointegration is to use the long-run coefficient estimates and form an error-correction term, ECM. After replacing the linear combination of lagged level variables by  $ECM_{t-1}$ , the short run model can once again be estimated using the same optimum lags. If the  $ECM_{t-1}$  carries a negative and significant coefficient, the variables are cointegrated and it will adjust towards equilibrium (Kremers *et al.*, 1992). The results in Table 4.2 show that all export equations which F-statistic did not provide conclusive results about the

existence of a cointegrated relationship; the  $ECM_{t-1}$  carries a negative and significant coefficient. Long-run coefficients of the export model show that the upper bound critical value of the F-test for cointegration is 3.99 at the 10% level of significance. The estimation results indicate that the dummy variable of NTB has negative impact on export for all 5 countries and significant for Indonesia, Philippines and Singapore.

Table 4.2: Diagnostic statistics for export models

Country	Optimal Lag	F-stat.	ECMt-1	LM	RESET	CUSUM	R <sup>2</sup> Adj.	Cointegration
Indonesia	(1,4,1,2,4)	6.31	-0.63(-3.19) ***	1.15	1.84	S	0.72	YES
Malaysia	(3,1,1,0,2)	1.18	-0.41(-2.14) **	0.38	5.48	S	0.74	YES
Philippines	(0,2,4,0,0)	2.76	-0.37(-3.56) ***	1.16	2.15	S	0.81	YES
Singapore	(3,1,0,0,3)	7.19	-0.38(-2.58) ***	2.43	0.16	S	0.83	YES
Thailand	(1,3,0,0,0)	0.89	-0.67(-4.02) ***	0.56	1.78	S	0.49	YES

Notes: The upper bound critical value of the F-test for cointegration is 3.99 at the 10% level of significance (Narayan 2005, p. 1988). The values in parentheses are the t-ratios. \* Significance at 10% level, \*\* significance at 5% level and \*\*\* significance at 1% level. LM is the Lagrange multiplier test of residual serial correlation and RESET is the Ramsey's test for function form. Both are distributed as  $\chi^2(1)$  and its critical values is 3.84 at 5% level of significance. "S"= stable.

Table 4.3 presents the best equations for the short-run coefficients. It is important to check the model estimation of the long-run and short-run. For the short-run NTB has negative impact on export; and it is significant for Philippines and Singapore.  $GDP_i$  has positive effect on export and significant for all 5 countries.  $GDP_w$  also has positive impact but significant for Indonesia, Malaysia, and Philippines. REER has negative and significant effect for Malaysia and Singapore. FDI has positive impact on export of Malaysia, Singapore, and Thailand; and it is just significant for Singapore.

Table 4.3: Short-run coefficient estimates of export models

	Indonesia	Malaysia	Philippines	Singapore	Thailand
Optimal Lag	[3,0,1,3]	[0,0,0,1]	[1,3,0,0]	[0,0,0,2]	[2,0,0,0]
variables					



$\Delta \ln \text{GDP}_i$	0.43(0.61)	1.01(2.94) ***	0.82(2.31) **	1.26(6.01) ***	1.26(4.19) ***
$\Delta \ln \text{GDP}_{it-1}$	2.36(3.08) ***		1.19(2.89) ***		0.17(0.54)
$\Delta \ln \text{GDP}_{it-2}$	1.6(1.87) *				-0.54(-1.77) *
$\Delta \ln \text{GDP}_{it-3}$	2.2(3.7) ***				
$\Delta \ln \text{GDP}_w$	5.38(3.41) ***	2.36(4.11) ***	3.76(5.13) ***	0.19(0.45)	0.43(1.2)
$\Delta \ln \text{GDP}_{wt-1}$			-1.22(-1.44)		
$\Delta \ln \text{GDP}_{wt-2}$			0.79(0.99)		
$\Delta \ln \text{GDP}_{wt-3}$			1.5(1.35)		
$\Delta \ln \text{REEX}_i$	0.18(1.3)	-0.34(-2.37) **	0.49(3.91) ***	-0.32(-1.81) *	0.18(1.86) *
$\Delta \ln \text{REEX}_{it-1}$	0.19(1.24)				
$\Delta \ln \text{FDI}_i$	-0.01(-0.25)	0.01(0.4)	-0.01(-0.72)	-0.004(-0.22)	0.04(1.52)
$\Delta \ln \text{FDI}_{it-1}$	-0.03(-1.31)	-0.05(-3.21) ***		0.08(3.35) ***	
$\Delta \ln \text{FDI}_{it-2}$	-0.06(-2.71) ***			0.04(2.38) **	
$\Delta \ln \text{FDI}_{it-3}$	-0.06(-3.1) ***				
$\Delta \text{Constant}$	-20.45(-3.62) ***	-2.57(-0.61)	-15.75(-6.95) ***	-5.81(-1.22)	-13.02(-2.81) ***
$\Delta \text{NTB}$	-0.12(-1.57)	-0.04(-0.84)	-0.17(-3.19) ***	-0.09(-2.99) ***	-0.02(-0.39)

*Note:* Numbers in parentheses are the t-ratios. \* Significance at 10% level, \*\* significance at 5% level and \*\*\* significance at 1% level. Numbers in the brackets indicate the lag length selected based on AIC for  $\Delta \ln \text{EX}$ ,  $\Delta \ln \text{GDP}_i$ ,  $\Delta \ln \text{GDP}_w$ ,  $\Delta \ln \text{REEX}_i$ , and  $\Delta \ln \text{FDI}_i$  respectively.

#### 4.4. Long Run Coefficients

Table 4.4 presents the results of the estimated long-run relationship. All the coefficients estimated are correctly signed. The table shows the long-run coefficients for  $\text{GDP}_i$ ,  $\text{GDP}_w$ , REER and NTB were correctly signed and significant for Indonesia where NTB is significant at 10% level. This represents that Indonesian export was affected by its GDP, and GDP of importing countries from Indonesia, its REER and NTB. Export was negatively influenced by REER and NTB, but positively influenced by GDP. In case of Philippines the NTB is significant at 1% level. The export of this country affected by  $\text{GDP}_w$  positively while NTB and REER negatively. For Singapore the NTB is significant at 10% level. The export of Singapore was influenced by its GDP positively and

influenced by NTB negatively. In addition, Thailand's export was positively influenced by GDP<sub>i</sub> and negatively influenced by REER. Overall, the results showed that REER was the most influential factor that drives export performance, followed by NTB and GDP<sub>i</sub>. Our results showed that FDI does not affect export.

**Table 4.4: Long-run coefficient estimates of export models**

Country name	Constant	LnGDP <sub>i</sub>	Ln GDP <sub>w</sub>	lnREEX <sub>i</sub>	lnFDI <sub>i</sub>	NTB
Expected sign		+	+	-	+	-
Indonesia	-32.59(-4.07)	1.12(1.99) *	5.23(4.78) ***	-0.43(-2.48) **	0.01(0.24)	-0.19(-1.97) *
Malaysia	-6.29(-0.68)	0.4(0.58)	1.39(1.06)	-0.8(-2.4) **	0.15(1.49)	-0.1(-0.99)
Philippines	-15.75(-6.95)	0.33(1.49)	1.7(4.82) ***	-0.49(3.91) ***	0.01(0.72)	-0.16(-3.2) ***
Singapore	-15.46(-1.37)	1.54(3.16) ***	0.49(0.46)	-0.9(-1.4)	0.2(1.38)	-0.23(-1.9) *
Thailand	-19.5(-5.2)	1.24(4.62) ***	0.65(1.34)	-0.28(1.9) *	0.06(1.48)	-0.04(-0.4)

Note: Numbers in parentheses are the t-ratios. \* Significance at 10% level, \*\* significance at 5% level and \*\*\* significance at 1% level.

#### 4.5. Diagnostic Tests

We are relied on the Akaike Information Criterion (AIC) and Schwarz Bayesian Criterion (SBC) models, so it is important to run diagnostic tests on these models. The tests are the LM (Lagrange Multiplier residual serial correlation test), the Ramsey RESET model misspecification test using the square of the fitted values, and the Cumulative Sum of recursive residuals (CUSUM) for structural stability test. Results for LM test, RESET test, CUSUM and Adjusted R<sup>2</sup> values for the model are presented in Table 4.2.

## 5. CONCLUSION

Exposure to global markets and competition would force industries to be more competitive and innovative. Protection of industries may bring gains for some parties in short run and losses for many others. The establishment of ASEAN, in particular the AFTA had raised a question whether reduction of NTBs has increase export activities of these economies? Based on the results of the ARDL long run regression, it is concluded that the effect of NTB on export is negative. Decrease in NTB may increase the level of export, and it is significant for Indonesia, Philippines and Singapore. In addition, three control variables of GDP, world GDP and REER are statistically significant. The exports of Indonesia, Singapore and Thailand were positively influenced by domestic GDP. The exports of all countries, except for Singapore were negatively influenced by exchange rate.

### **5.1. Policy Implications**

Due to the impact of policies will affect the long run, so the policy implications will only focus on long run significant variables. This study reveals that reduction in NTB, increase in GDP, and depreciation of exchange rate may increase export activities. Therefore, in order to increase export, government should abolish trade protection policy such as NTB, tariff, quota, etc. Besides, governments should promote economy growth and manage of the exchange rate policy because volatile exchange rate may cause uncertainty and hamper export activities.

### **5.2. Limitations and Recommendation for Future Research**

In this study, there are several limitations. The first limitation is lack of sufficient data for the NTB. Quantitative NTB data are scant. Therefore, in this study the NTB considered

as a dummy variable. If there was a reliable source of data for NTB then the effect of other variables in this research may be different. Then, it is recommended for future study to try to collect the data from governments; and it is not easy to obtain such data from different countries, unless there is a strong commitment for governments. If countries provide such data on the basis of tariff line percentage, so their effect on trade activities can be investigated more precisely. Maybe the WTO or regional organizations can force governments to provide their data for NTB on yearly basis; and it would help to create more transparent and more competitive trade environment.

## REFERENCES

- Andersen, P. S. and Hainaut, P. (1998). *Foreign Direct Investment and Employment in the Industrial Countries*, Bank for International Settlements Working Paper 61.
- Arize, A.C. (1990). An Econometric Investigation of Export Behaviour in Seven Asian Developing Countries. *Applied Economics*, 22: 891-904.
- Arize, A.C., T. Osang and D.J. Slottje (2000). Exchange-Rate Volatility and Foreign Trade: Evidence from Thirteen LDC's. *Journal of Business and Economic Statistics*, 18: 10-17.
- Baghasa, H. (2005). *Non-Tariff Barriers in the Great Arab Free Trade Area*. National Agricultural Policy Center, Policy Brief No. 5.
- Beghin, J. C. (2006). *Non-tariff Barriers*. Working Paper 06-WP 438, Iowa State University.
- Benáček, V. (2003). *Determining Factors of Exports and Imports: A Synthesis of Explanatory Paradigms*. IIASA-ETI Occasional Paper No. 11.
- Canlas, Corinne (2009). GATT Issues, Gut Issues. *Philippine Journal of Third World Studies*, 24, 115-134.
- Chemingui, M. A. and Dessus, S. (2008). Assessing Non-Tariff Barriers in Syria. *Journal of Policy Modeling*, 30, 917-928.
- Chen, M.X., Otsuki, T. and Wilson, J.S. (2006). Do Standards Matter for Export Success? World Bank Policy Research Working Paper No.3809, Washington D.C.: World Bank.
- Clausing, K. A. (2000). Does Multinational Activity Displace Trade. *Economic Inquiry*, 38, 190-205.
- Coughlin, C. C. and Wood, G. E. (1989). *An Introduction to Non-Tariff Barriers to Trade*. Federal Reserve Bank of St. Louis.
- Daquila T.C. and Huy, L.H. (2003). Singapore and ASEAN in the Global Economy. The Case of Free Trade Agreements. *Asian Survey*, 43, 908-928.
- Daumal, M. and Özyurt, S. (2011). The Impact of International Trade Flows on Economic Growth in Brazilian States. *Review of Economics and Institutions*, 2, 1-25.

- De, P. (2006). *Why Trade Costs Matter?* Asia-Pacific Research and Training Network on Trade Working Paper Series, No. 7.
- Eaton, J. and Tamura, A. (1994). *Bilateralism and Regionalism in Japanese and US Trade and Direct Foreign Investment Patterns*. NBER Working Paper, No. 4758, Cambridge, MA.
- Engle, R. F. and Granger C. W. J. (1987). Cointegration and Error Correction Representation: Estimation and Testing. *Econometrica*, 55, 251-76.
- European Chamber of Commerce in Singapore (2010). *Summary of Barriers to Trade and Services in Singapore*. Regional Trade Committee.
- Fang, W. S. and Miller, S. M. (2004). *Exchange Rate Depreciation and Exports: The Case of Singapore Revisited*. Department of Economics Working Paper Series, 2004-45. University of Connecticut.
- Fontagne, L., Mimouni, M. and Pasteels, J.M. (2005). Estimating the Impact of Environmental SPS and TBT on International Trade. *Integration and Trade*, 28, 7-37.
- Gebrehiwet, Y., Ngqangweni, S. and Kirsten, J.F. (2007). Quantifying the Trade Effect of Sanitary and Phytosanitary Regulations of OECD Countries on South African Food Exports. *Agrekon*, 46, 23-39.
- Goldstein, M. and M.S. Khan (1978). The Supply and Demand for Exports: A Simultaneous Approach. *The Review of Economics and Statistics*, 60, 275-286.
- Hassan, M.K. and D.R. Tufte (1998). Exchange Rate Volatility and Aggregate Export Growth in Bangladesh. *Applied Economics*, 30, 189-202.
- Iacovone, L. (2005) The Analysis and Impact of Sanitary and Phytosanitary Measures. *Integration and Trade*, 28, 97-140.
- Jakubiak, M., Maliszewska, M., Orlova, I., Rokicka, M. and Vavryschuk, V. (2006). *Non-tariff Barriers in Ukrainian Export to the EU*. Center for Social and Economic Research. Warsaw.
- Kaihatu, Thomas Stefanus (2003). AFTA: Indonesian Industrialist and Customs Perspective, *Jurnal Manajemen & Kewirausahaan*, 5, 112-122.
- Katircioglu, S., Eminer, F., Aga, M. and Ozyigit, A. (2010). Trade and Growth in the Pacific Islands – Empirical Evidence from the Bounds Test to Level Relationships and Granger Causality Tests. *Romanian Journal of Economic Forecasting*, 4, 88-101.
- Kremers, J. J. M., Ericsson, N. R., and Dolado, J. J. (1992). The Power of Cointegration Tests, *Oxford Bulletin of Economics and Statistics*, 54, 325-348.
- Ma, Jing and Lu, Yuduo (2011). Free Trade or Protection: A Literature Review on Trade Barriers. *Research in World Trade*. 2, 69-76
- Marandu, E., E. (2008). Strategy Factors Associated With the Export Performance of Manufacturing Firms. *Export Performance of Firms*, 11, 33-76.
- Milanzi, A. Mursali (2012). The Impact of Barriers on Export Behaviour of a Developing Country Firms: Evidence from Tanzania, *International Journal of Business and Management*, 7, 10-18.
- Mmasi, J. and Ihiga, S. (2007). *A Survey of Non-Tariff Barriers that Affect Tanzanian Imports and Exports Within EAC, SADC and COMESA Countries*. Trade and Investment Consortium, Kenya.
- Narayan, P. K. (2005). The Saving and Investment Nexus for China: Evidence from Cointegration Tests, *Applied Economics*, 37, 1979-1990.

- O'Neill, H. and Ross, W. (1991). Exchange Rates and South Korean Exports to OECD Countries. *Applied Economic*, 23, 1227-1236.
- Otsuki, T., and Wilson, J.S. and Sewadeh, M. (2001). Saving Two in a Billion: Quantifying the Trade Effect of European Food Safety Standards on African Exports. *Food Policy*, 26, 495-514.
- Pesaran, M. H., and Shin, Y. (2002). Long-Run Structural Modelling. *Econometric Reviews*, 21, 49-87.
- Pesaran, M. H., Shin, Y., and Smith, R. J. (2000). Structural Analysis of Vector Error Correction Models with Exogenous I(1) Variables. *Journal of Econometrics*, 97, 293-343.
- Roe, T. (2004). *International Trade as a Source of Economic Growth: Trade Barriers and Institutions*. American Association for the Advancement of Science Annual Meeting, Seattle Washington.
- Sachs, J. and Warner, A. (1995). Economic Reform and the Process of Global Integration. *Brookings Papers on Economic Activity*, 1, 1-118.
- Smith, M. (2004). Impact of the Exchange Rate on Export Volumes. *Reserve Bank of New Zealand*, 67, 5-13.
- Summer, D. A., Smith, V. H. and Rosson, C. P. (2007). *Tariff and Non-Tariff Barriers to Trade*. [www.coursehero.com/file/3208602/tr-2007-02](http://www.coursehero.com/file/3208602/tr-2007-02). Retrieved 23 March 2013.
- Wacziarg, R. and Welch, K. H. (2003). *Trade Liberalization and Growth: New Evidence*. NBER Working Paper Series 10152.
- Weil, N. David (2009). *Economic Growth*. New York: Pearson.
- Winkelmann, L. and Winkelmann, R. (1997). The Costs of Non-Tariff Barriers to Trade: Evidence from New Zealand. *Weltwirtschaftliches Archiv*, 133, 270-281.