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DOES ECONOMIC INTEGRATION PROMOTE TRADE? EMPIRICAL EVIDENCE FROM ASEAN-5 AND JAPAN

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ABSTRACT

In view of the urgency to enhance production efficiency and trade competitiveness, the ASEAN countries have adopted the first level of economic integration through the ASEAN Free Trade Area (AFTA) in 1992. This free trade agreement will be fully established by 2010 with all the import tariffs eliminated for the six original members, and by 2015 for the new members. Under this economic integration, it is therefore crucial to find out whether the integration is trade creating or trade diverting between the member countries with their major non-member trading partners, Japan. This study intends to extend the previous regional studies in three dimensions. First, a simple model based on the Common Effective Preferential Tariff (CEPT) Scheme is set up to measure the progress of economic integration in term of AFTA for each of the ASEAN-5 countries. Secondly, the measure is then used to determine the impact of economic integration on the bilateral trade flows between each of the ASEAN-5 and their main trading partner, Japan. Thirdly, the standard export and import models are extended to include other possible effects such as foreign direct investments (FDI) and financial crisis to address the important issue of international economics in the ASEAN-Plus 3 region. Our estimated results, which are based on the unrestricted error-correction model of autoregressive distributed lag (ARDL) modeling approach, show that there is a significant trade creation between ASEAN-5 and Japan. Among others, the three countries, namely Indonesia, Singapore and Thailand, have gain in trade flows to Japan due to the Japanese foreign Investments to the countries. The Philippines and Malaysia, who receive the least foreign investment from Japan are identified as the two countries that will benefited the most, in terms of trade flows to Japan, from the economic integration under the AFTA establishment.

Keywords: *Economic integration, trade flows, foreign direct investment.*

JEL classification: *F10; C22*

1. INTRODUCTION

The Japan and ASEAN countries have a friendly and cooperative relationship since the 1970s. Japan is one of the most important trade partners for ASEAN countries and vice versa. These countries have been Japan's important supplier of raw materials and markets for light industrial products. Besides, these countries have been Japan's important production base.

Since 1985, Japanese corporations were actively undertaken direct investment in the region. Japan, on the other hand, has been ASEAN's important supplier of capital, technology and development aid. Unfortunately the bilateral trade flows between Japan and these countries are asymmetrical, as most of these ASEAN countries have sustained a trade deficit with Japan, while Japan is running a trade surplus with these countries since 1990s. Japan's total import from these countries constitutes only a small proportion of its total import. In 2003, the Japan's total import from Indonesia, Malaysia, Thailand and the Philippines constitutes, respectively, 4.27%, 3.29%, 3.10% and 1.84% of Japanese total imports. Among these ASEAN countries, Japan imports the least from Singapore; it is merely 1.43% of the Japan's total import (Direction of trade Statistics Yearbook). The above-mentioned aspects portray that Japan has been a comparatively important supplier to ASEAN but not vice versa.

In view of the urgency to further enhance production efficiency and trade competitiveness, in particular when competition in the Asian region has become more intense with the rise of the big economies like China and India, the ASEAN countries have adopted the ASEAN Free Trade Area (AFTA) in 1992, of which will be fully established by 2010 with all the import tariffs eliminated for the six original members, and by 2015 for the new members. The member countries of ASEAN have made a significant efforts in lowering the intra-regional tariffs through the mechanism of Common Effective Preferential Tariff (CEPT) on goods traded within the member countries, which meet a 40% ASEAN content requirement.

With the formation of AFTA, analyses on regional trading blocs in the ASEAN region have become increasingly important. Elliott and Ikemoto (2004) Clarete *et al.* (2003), Martinez-Zarzoso (2003), Thorton and Goglio (2002), Sharma and Chua (2000), Hassan (2001) and Nilson (2000) used the gravity model to investigate the intra-regional trade flows. Sharma and Chua (2000) found that the ASEAN integration scheme did not increase intra-ASEAN trade, but an increase in trade occurred with other APEC trade groups. Elliott and Ikemoto (2004) and Clarete *et al.* (2003) studied not only intra-ASEAN trade but also the effect of AFTA on extra-regional trade. Elliott and Ikemoto found that intra-ASEAN trade flows were not significantly affected in the years immediately following the signing of the AFTA agreement, and the agreement has not been significantly detrimental welfare effects for the rest of the world. Clarete *et al*. (2003), on the other hand, found that AFTA, as one of the major preferential trade agreements (PTA), has reduced trade flows between the ASEAN and other trade blocs. Most of the above studies were based on the 1990's data and were focused on either intra-regional trades or trades between different integrated regions. In addition, these works consider the effect of AFTA on trade flows upon the signing of the free-trade agreements. In this set up, an index is quoted based on the fact if the country is a member of the integration (assigned value 1) or a non-member (assigned value 0). Research works that analyze on the effects of AFTA on ASEAN trade flows with more considerations and dimensions remain scarce.

In view of this, we attempt to extend this regional studies in three folds. First, we try to measure the level of AFTA establishment over the years in 1992-2003 through a simple model based on the Common Effective Preferential Tariff (CEPT) Scheme. Secondly, the computed index is then used to determine the impact of AFTA on the bilateral trade flows between each of the ASEAN-5 countries and their major non-integrator trade partner, Japan. In this study, we focus on Japan and ASEAN, as Japan is one of the most established trading partners of these

countries in the East-Asia Region. Thirdly, we extend the regional analysis by including the intertemporal linkages of FDI on trade flow in the standard model. Besides AFTA, it is also important to determine the effects of FDI to trade flows in the region.

This paper is structured as follows: Section 2 describes the econometric methods that we use to capture the progress of AFTA establishment over the years, the long-run and short-run effects of AFTA and FDI on trade flows between Japan and the ASEAN-5 countries. Section 3 reports the empirical results and Section 4 concludes.

2. ECONOMETRIC METHODOLOGY

The analysis consists of a few steps. First, a simple model is set up to compute the AFTA index which represents the progress of AFTA establishment since 1992. Second, the time series included in the econometric models are tested on their order of integration through the two widely used Augmented Dickey-Fuller (ADF) and Phillip-Perron (PP) unit root test. Third, the extended standard exports and imports model, which include FDI, are estimated based on the autoregressive distributed lag (ARDL) approach. The bounds test under this approach, proposed by Pesaran et al. (2001) is robust, especially for this analysis, as the time series included in this analysis are a mixture of I(1) and I(0) and the sample size is not big.

The AFTA Index

The AFTA index is computed based on a simple model constructed from the CEPT schedule. The simple model can be presented as

$$AFTA_{k,t} = \frac{R_{k,f}}{R_{k,t}} \tag{1}$$

where $R_{k,t}$ is the average CEPT tariff rate of country k, where k = Indonesia, Malaysia, the Philippines, Singapore and Thailand, at year t, and R_f represent the average tariff rate of the country in 2003. This model set the $AFTA_{k,t}$ index to be 1.00 in 2003 as the CEPT rates of most products in ASEAN-5 are as low as 0-5%. Based on this ground, we consider AFTA as fully implemented in 2003 for these first five countries. The index, $AFTA_{k,t}$, thus measures the establishment of the ASEAN free trade area of country k at time t based on the annual average tariff rate, the lower the annual average tariff rate with respect to that of 2003, the higher the AFTA index will be.

Bilateral Trade Models

The standard exports and imports demand model is as follow:

$$Q_x = B\left(\frac{EP^*}{P}\right)^{\gamma} {Q_f}^{\delta} \tag{2}$$

$$Q_m = A\left(\frac{P}{EP^*}\right)^{\alpha} {Q_d}^{\beta} \tag{3}$$

where Q_m and Q_x are the real imports and exports of the home country respectively, E is the nominal exchange rate, P^* is the foreign price and P is the domestic price, Q_d is the real domestic income and Q_f is the real foreign income. In this study, we compute an index that measures the progress of AFTA establishment. Furthermore, we add the FDI as one of the variables since the FDI of Japan to ASEAN-5 played an important role in determining the bilateral trade flows. Therefore, the bilateral exports and imports demand functions for Japan with ASEAN-5 are as follows:

$$X_t^k = \beta_0 + \beta_1 GDP_t^j + \beta_2 P_t^{Jm} + \beta_3 FDI_t^k + \beta_4 AFTA_t^k + \beta_5 DUM_t^k + \varepsilon_{2t} \quad (4)$$

$$M_t^k = \alpha_0 + \alpha_1 GDP_t^k + \alpha_2 P_t^{Jx} + \alpha_3 FDI_t^k + \alpha_4 AFTA_t^k + \alpha_5 DUM_t^k + \varepsilon_{1t} \quad (5)$$

k = Indonesia(I), Malaysia(M), the Philippines(P), Singapore(S) and Thailand(T).

X_t^k is the respectively real exports of each ASEAN-5 countries to Japan and M_t^k is the real imports of each ASEAN-5 countries from Japan in period *t;* GDP_t^j is the real gross domestic product of Japan, GDP_t^k is the real gross domestic product of the respective ASEAN-5 countries, P_t^{Jm} is the relative import price of Japan, P_t^{Jx} is the relative export price of Japan, FDI_t^k is the Japan's direct investment to the respective ASEAN-5 countries, $AFTA_t^k$ is the AFTA index for the respective ASEAN-5 countries, DUM_t^k is the Asian-financial-crisis dummy variable for the respective ASEAN-5 countries and ε_t is the error term.

Autoregressive Distributed Lag (ARDL Approach)

For the purpose of this study, we determine the impact of AFTA establishment on Japanese imports and exports trade flows with ASEAN-5 countries based on unrestricted error-correction model of autoregressive distributed lag (ARDL) approach proposed by Pesaran *et al.* (2001). This approach is adopted for, first, our sample size is small, and second, the time series included in the analysis is tested to be a mixture of I(0) and I(1). An I(0) time series is stationary at its level, whereas an I(1) time series is stationary at its first difference. The bounds test procedure under this approach is robust for small-sample analysis, and it is appropriate for analysis with consists of a mixture of I(0) and I(1) explanatory variables (See Pesaran *et al.*, 2001). The Johansen-Juselius (1990) cointegration method is not appropriate for small sample analysis and analysis with a mixture of I(0) and I(1) time seires, so does the panel cointegration analysis.

The unrestricted error-correction models (UECM), or error correction version of Autoregressive distributed lag (ARDL) approach, for the ASEAN-5 exports and imports models can be written as:

$$\begin{aligned} DX_t^k &= b_0 + \sum_{i=0}^{m} b_{1i} DGDP_{t-i}^j + \sum_{i=0}^{m} b_{2i} DP_{t-i}^{Jm} + \sum_{i=0}^{m} b_{3i} DFDI_{t-i}^k + \sum_{i=1}^{m} b_{4i} DX_{t-i}^k \\ &+ b_5 X_{t-1}^k + b_6 GDP_{t-1}^j + b_7 P_{t-1}^{Jm} + b_8 FDI_{t-1}^k + b_9 AFTA_t^k + \alpha_{10} DUM + u_{2t} \quad (6) \\ DM_t^k &= a_0 + \sum_{i=0}^{n} a_{1i} DGDP_{t-it-i}^k + \sum_{i=0}^{n} a_{2i} DP_{t-i}^{Jx} + \sum_{i=0}^{n} a_{3i} DFDI_{t-i}^k + \sum_{i=1}^{n} a_{4i} DM_{t-i}^k \end{aligned}$$

$$+ a_5 M^{k}_{t-1} + a_6 GDP^{k}_{t-1} + a_7 P^{Jx}_{t-1t-1} + a_8 FDI^{k}_{t-1} + a_9 AFTA^{k}_{t} + \alpha_{10} DUM + u_{1t} \qquad (7)$$

where D is the first difference operator, m is the lag length selected based on the AIC criteria, u_{1t} and u_{2t} are white and normally distributed residuals. All the time series are transformed into logarithm form except the AFTA index and crisis dummy. Logarithm transformation is useful as it reduces the problem of heteroskedasticity by compresses the scale in which the variables are measured. The bounds test developed by Pesaran *et al.* (2001) is the F-statistic version of the bounds testing approaches for the lagged level variables in the right-hand side of UECM. The null and alternative hypotheses are:

$H_0 : a_5 = a_6 = a_7 = a_8 = 0;\ H_1 : a_5 \neq a_6 \neq a_7 \neq a_8 \neq 0$ for the exports model and

$H_0 : b_5 = b_6 = b_7 = b_8 = 0;\ H_1 : b_5 \neq b_6 \neq b_7 \neq b_8 \neq 0$ for the imports model.

The above null hypotheses indicate the non-existence of the long-run relationship in the two models. The computed F-statistic value of the above test will be compared with the critical bound values (lower and upper values) of Pesaran *et al.* (2001). A conclusive inference can be made if the computed F-statistic is either higher than the upper bound value or lower than the lower bound value. The null hypothesis of no long-run relationship can be rejected when the computed F-statistic exceeds the upper critical bound. We cannot reject the null of no cointegration when the computed F-statistic falls below the lower critical bound. If the computed F-statistic falls between the upper and lower bounds, a conclusive inference cannot be made.

The UECM captures both the long-run and short–run effects. The long-run coefficients (elasticities) are the coefficient of the one-lagged explanatory variables (multiplied with a negative sign) divided by the coefficient of the one-lagged dependent variable. The coefficients of the first-differenced variables capture the short-run effects between the respective variables. All data employed in this analysis are collected from the International Financial Statistics (IFS) and Direction of Trade. Annual data spanning from 1970-2003 are employed. The real imports and real exports of Japan-ASEAN-5 bilateral trade flows (measured in US million) are obtained using the nominal imports and exports deflated by the unit import and unit export prices (2000=100) respectively. The real GDP data are obtained using the nominal GDP deflated by the GDP deflator (2000=100).

3. EMPIRICAL RESULTS

Before estimating the unrestricted error-correction model, the standard Augmented Dickey-Fuller (ADF) and Philips-Perron (PP) unit root tests are conducted to check the stationarity, or order of integration, of each of the time series employed. The results obtained from these two tests are reported in Table 1. It is found that many series are I(1), however, there are several I(0) series. Such a mix results provides a good rationale for employing the UECM version of ARDL approach.

The estimated ARDL models of Equation (6) and (7) are reported in Table 2 and 3. The robustness of this estimated models are confirmed by the diagnostic checks, the CUSUM and CUSUMSQ stability tests (See Figure 4). The bounds cointegration test results reported in Table 4 and 5 show that the time series included in model 1 (the ASEAN-5 exports to Japan model) and model 2 (the ASEAN-5 imports from Japan) are cointegrated, indicating that these

Table 1
Augmented Dickey-Fuller & Philips-Perron Unit Root Tests

Variable	ADF				PP			
	Level		First Difference		Level		First Difference	
	No Trend	Trend	No Trend	Trend	No Trend	Trend	No Trend	Trend
X^M	-0.874[0]	-3.840[1]**	-4.175[2]***	-4.089[2]**	-0.874[1]	-3.299[1]*	-5.553[1]***	-5.517[1]***
X^I	-3.073[0]**	-4.387[1]***	-4.999[1]***	-5.139[1]***	-3.073[0]**	-3.429[1]*	-4.000[1]***	-4.139[1]**
X^P	0.25[0]	-2.007[0]	-5.337[0]***	-5.409[0]***	0.239[1]	-2.042[1]	-5.337[1]***	-5.409[1]***
X^S	-1.902[0]	-2.283[1]	-5.741[0]***	-5.963[0]***	-1.941[1]	-2.339[1]	-5.742[1]***	-5.965[1]***
X^T	-0.554[1]	-1.889[1]	-4.031[0]***	-3.963[0]**	-0.559[2]	-1.709[3]	-4.024[1]***	-3.955[1]**
M^M	-2.010[0]	-1.391[0]	-4.352[0]***	-4.601[0]***	-1.999[3]	-1.589[2]	-4.249[5]***	-4.495[6]***
M^I	-2.555[0]	-3.031[0]	-5.792[0]***	-5.945[0]***	-2.664[2]*	-3.036[1]	-5.848[3]***	-6.127[4]***
M^P	-0.424[0]	-2.012[1]	-4.579[0]***	-4.499[0]***	-0.489[1]	-1.881[2]	-4.579[0]***	-4.499[0]***
M^S	-2.213[0]	-0.915[0]	-4.867[0]***	-5.364[0]***	-2.188[1]	-0.915[0]	-4.867[0]***	-8.357[3]***
M^T	-0.859[0]	-1.521[0]	-4.495[0]***	-4.468[0]***	-0.878[2]	-1.521[0]	-4.422[4]***	-4.379[5]***
P^{Jm}	-0.861[0]	-2.733[1]	-4.534[0]***	-4.488[0]***	-0.939[3]	-2.065[4]	-4.429[5]***	-4.359[5]***
P^{Jx}	-1.587[0]	-2.164[0]	-5.173[0]***	-5.219[0]***	-1.572[1]	-2.320[1]	-5.172[1]***	-5.220[1]***
GDP^J	-0.572[0]	-3.997[1]**	-5.530[0]***	-5.482[0]***	-0.573[1]	-3.359[1]*	-5.530[1]***	-5.481[1]***
GDP^M	-2.662[0]*	-2.33][0]	-4.565[0]***	-4.822[0]***	-2.798[3]*	-2.300[5]	-4.490[3]***	-4.751[3]***
GDP^J	-0.602[0]	-3.247[1]*	-4.442[1]***	-4.463[1]***	-0.790[1]	-2.491[2]	-4.181[3]***	-4.113[4]**
GDP^P	-0.355[0]	-2.137[0]	-4.260[0]***	-4.198[0]**	-0.580[2]	-2.345[2]	-4.260[0]***	-4.198[0]**
GDP^S	-2.625[0]*	-1.719[1]	-3.799[0]***	-4.086[0]**	-2.625[0]*	-1.450[1]	-3.702[4]***	-3.971[5]**
GDP^T	-1.529[0]	-1.738[0]	-5.651[0]***	-5.701[0]***	-1.529[1]	-1.775[2]	-5.650[2]***	-5.701[1]***
FDI^M	-2.143[1]	-1.548[1]	-8.644[0]***	-8.920[0]***	-2.206[0]	-2.876[2]	-8.726[1]***	-9.468[2]***
FDI^I	-3.555[0]**	-3.616[0]**	-4.929[1]***	-5.146[1]***	-3.551[1]**	-3.575[1]**	-7.852[3]***	-8.997[6]***
FDI^P	-1.906[0]	-3.664[0]**	-7.129[0]***	-7.156[0]***	-1.833[1]	-3.774[1]**	-7.135[1]***	-7.191[1]***
FDI^S	-2.695[1]*	-2.356[0]	-6.729[0]***	-7.342[0]***	-2.832[1]*	-2.180[1]	-6.744[1]***	-7.356[1]***
FDI^T	-1.443[0]	-1.903[0]	-6.140[0]***	-6.270[0]***	-1.425[1]	-1.938[1]	-6.127[1]***	-6.251[1]***

Notes: The null hypothesis is that the series is non-stationary, or contain a unit root. Asterisks (*), (**), (***) denote significance level at 10, 5, 1 percent levels respectively based on the MacKinnon critical values. Optimal lag lengths based on the AIC criteria are provided in the parentheses. The following notation applies in the table: X^k = Country k of ASEAN-5 exports to Japan, and M^k = Country k of ASEAN-5 imports from Japan, where k = *M, I, P, S* and *T* (*M*=Malaysia, *I*=Indonesia, *P* = the Philippines, *T* = Thailand, *S* = Singapore, and *J* = Japan,); P^{Jm} = Japan's relative import price, P^{Jx} = Japan's relative export price, GDP^k = country k Gross Domestic Product, FDI^k = Japan's foreign direct investment to country k of ASEAN-5.

Table 2
ASEAN-5 Export Flows to Japan
Estimations of Unrestricted Error-Correction Models
(Dependent Variable: DX^K_t)

Country / *Variable*	*Malaysia*	*Singapore*	*Thailand*	*Indonesia*	*Philippines*
$DGDP^J_t$	0.268	0.089	-0.059	-1.12	-0.090
$DGDP^J_{t-1}$		0.745***		0.925***	0.471***
$DGDP^J_{t-2}$				0.479***	
DP^{Jm}_t	-0.474**	-0.218	-1.229***	-0.317	-0.224
DP^{Jm}_{t-1}	-0.916***	-0.658***	0.208	1.208**	0.487**
DP^{Jm}_{t-2}				0.614**	
DP^{Jm}_{t-3}				0.382*	
$DFDI^k_t$	0.073	0.030	-0.039	-0.142***	-0.016
$DFDI^k_{t-1}$			-0.102***	0.373***	
$DFDI^k_{t-2}$				0.219***	
$DFDI^k_{t-3}$				0.138***	
$DFDI^k_{t-4}$				0.475	
DX^k_{t-1}		-0.335**		-1.842***	
DX^k_{t-2}				-1.484***	
DX^k_{t-3}				-1.031**	
DX^k_{t-4}				-0.421*	
X^k_{t-1}	-0.689***	-0.299*	-0.542***	1.561**	-0.876***
GDP^J_{t-1}	0.729**	-0.091	0.089	-0.828***	0.119***
P^{Jm}_{t-1}	-0.486*	-0.391**	-1.413***	-1.723***	-13.067***
FDI^k_{t-1}	0.085	0.188**	0.083**	-0.742**	-0.017
$AFTA^k$	0.216**	0.135**	0.099*	0.154**	0.345***
DUM^k	-0.118*	-0.187**	-0.084**	-0.113***	0.027
Constant	-1.093**	0.256	0.533**	2.899***	0.733***
R^2	0.780	0.860	0.937	0.991	0.878
Adjusted R^2	0.676	0.767	0.900	0.949	0.793
F-statistic	7.462	9.237	25.545	23.845***	10.424
(p-value)	0.000***	0.000***	0.000***	0.001***	0.000***
Diagnostic Checking (LM version)					
Serial Correlation (χ^2)	0.499	2.129	1.174	2.929	0.485
(p-value)	0.480	(0.144)	(0.279)	(0.087)	(0.486)
Normality (χ^2)	0.802	0.819	0.870	0.586	0.514
(p-value)	0.670	0.664	0.0.647	0.746	0.773

Note: ***p <0.01, ** p<0.05, * p<0.10 (two-tailed test). *D* is first difference operation. *k* = *M, I, P, S* and *T* (*M*=Malaysia, *I*=Indonesia, *P* = the Philippines, *S* = Singapore, *T* = Thailand) and *J* = Japan. The optimal lag-structure for each model is determined by the AIC criteria.

Table 3
ASEAN-5 Import Flows from Japan
Estimations of Unrestricted Error Correction Models
(Dependent Variable: DM^k_t)

Country	*Malaysia*	*Singapore*	*Thailand*	*Indonesia*	*Philippines*
$DGDP^k_t$	-0.397	0.035	0.694***	0.167	0.757*
$DGDP^k_{t-1}$	0.621**	0.511***			0.628**
$DGDP^k_{t-2}$					0.893***
$DGDP^k_{t-3}$					0.442
DP^{Jx}_t	-0.907	-1.649***	-0.387	-0.412	0.224
DP^{Jx}_{t-1}	3.219***		-0.824**	2.259***	1.939*
DP^{Jx}_{t-2}	2.261***			1.159**	0.949
DP^{Jx}_{t-3}	1.799**				
$DFDI^k_t$	0.114**	0.039	0.173***	0.083	0.319**
$DFDI^k_{t-1}$	0.088			-0.159**	-0.903***
$DFDI^k_{t-2}$				-0.063	-0.684***
$DFDI^k_{t-3}$					-0.321**
DM^k_{t-1}					1.219**
DM^k_{t-2}					0.323
DM^k_{t-3}					0.529**
M^k_{t-1}	-0.551***	-0.376**	-1.049***	-1.389***	-2.165***
GDP^k_{t-1}	0.942***	0.17**	1.579***	0.442**	-0.246
P^{Jx}_{t-1}	-5.403***	-0.943**	0.603***	-2.091***	-0.901
FDI^k_{t-1}	0.146*	0.225***	0.356***	0.359***	1.514***
$AFTA^k$	0.389***	0.103**	0.444***	0.142*	0.572**
DUM^k	-0.284***	-0.147**	-0.152***	-0.267**	-0.183*
Constant	5.438***	0.901*	-4.035***	0.026	0.679
R-squared	0.813	0.768	0.856	0.861	0.872
R-bar-squared	0.639	0.657	0.788	0.739	0.587
F-statistic	4.659	6.947	12.512	7.068	42.198
(p-value)	0.003***	0.000***	0.000***	0.000***	0.001***
Diagnostic Checking (LM version)					
Serial Correlation (χ^2)	0.905	0.059	0.019	1.587	2.579
(p-value)	0.342	0.808	0.891	0.208	0.108
Normality ($\div^2$)	2.218	0.077	0.015	1.782	0.176
(p-value)	0.330	0.962	0.992	0.410	0.916

Note: ***p <0.01, ** p<0.05, * p<0.10 (two-tailed test). *D* is first difference operation. *k* = *M, I, P, S* and *T* (*M*=Malaysia, *I*=Indonesia, *P* = the Philippines, *S* = Singapore, *T* = Thailand) and *J* = Japan. The optimal lag-structure for each model is determined by the AIC criteria.

Table 4
ASEAN-5 Export Flows to Japan
Results of Cointegration Tests
(F-Statistic Version of Bounds Test)

Country	*Malaysia*	*Singapore*	*Thailand*	*Indonesia*	*Philippines*
Computed F-Statistic	8.537*	9.241*	4.546*	5.909*	4.528*

Notes: The lower and upper critical values for the F-statistic version of the bounds test [lower critical bound, upper critical bound] at 5% significance level is [3.219,4.378]. * denotes the computed test statistic (F-test) exceeds the upper critical bounds at 5% significance level and rejects the null of no cointegration.

Table 5
ASEAN-5 Import Flows from Japan
Results of Cointegration Tests
(F-Statistic Version of Bounds Test)

Country	*Malaysia*	*Singapore*	*Thailand*	*Indonesia*	*Philippines*
Computed F-Statistic	4.764*	5.929*	4.691*	5.295*	4.924*

Notes: The lower and upper critical values for the F-statistic version of the bounds test [lower critical bound, upper critical bound] at 5% significance level is [3.219, 4.378]. * denotes the computed test statistic (F-test) exceeds the upper critical bounds at 5% significance level and rejects the null of no cointegration.

Figure 1: ASEAN-5 Export Flows to Japan

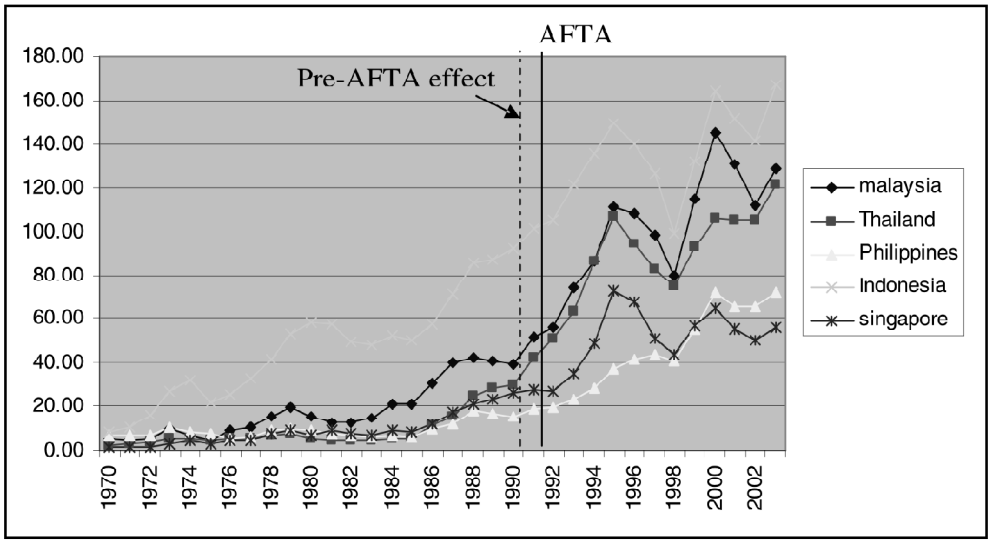


Figure 2: ASEAN-5 Import Flows from Japan

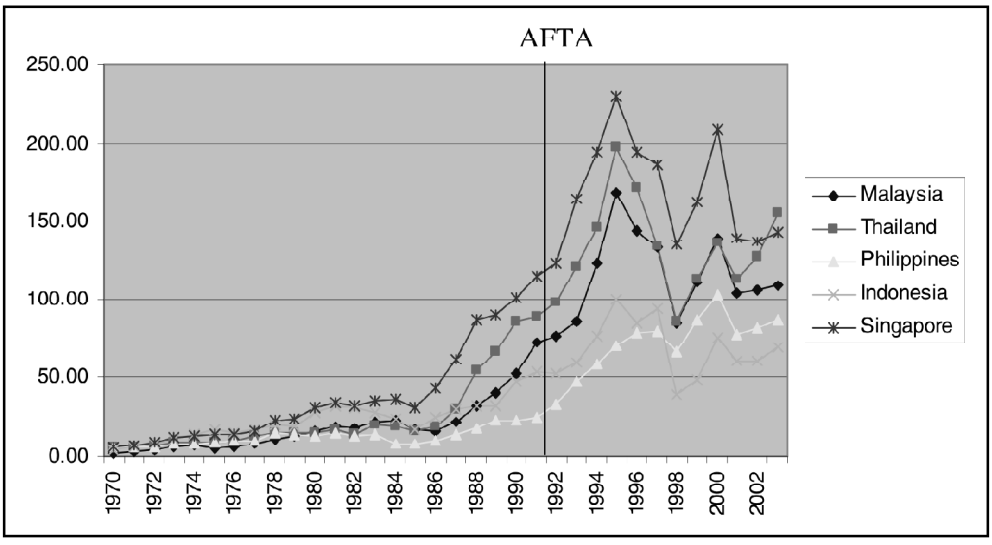
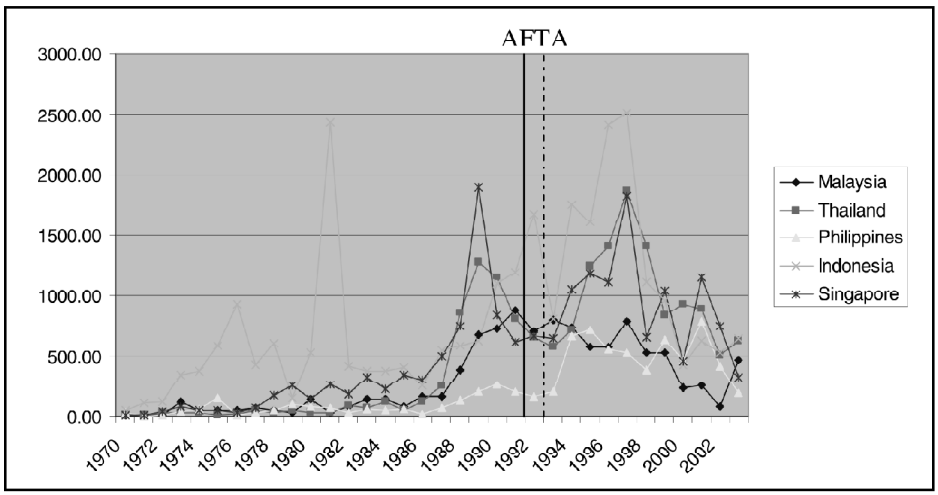


Figure 3: Japan Direct Investment to ASEAN-5



variables have a steady-state long-run equilibrium relationship and will not drift away from each other without bound.

The positive and significant coefficients of $AFTA^k$ index estimated for each ASEAN-5 country's exports to Japan, as presented in Table 2 and 3, indicates that there are trade creations between each of the countries and Japan, and all of the countries have benefited from the establishment of AFTA in terms of trade flows. Among others, the Philippines and Malaysia, with the highest estimated coefficients of 0.345 (at 1% significance level) and 0.216 (at 5% significance level) respectively, are identified to be the two countries where AFTA contributes relatively more as compared to other factors in the export demand function, which include Japanese import and export prices, Japanese income and direct investments. The main imports of Japan from the Philippines are machinery and equipments, which constitutes to 71% of the total imports. The imports from Malaysia, on the other hand, are machinery and equipments (electrical and electronic), and mineral fuels, which constitute to 44.7% and 27.2% respectively of the total exports (see Table 8). The estimated model of each ASEAN-5 imports from Japan, on the other hand, indicates that the AFTA establishment also promotes imports of ASEAN-5 countries from Japan. This illustrates a win-win situation for the AFTA members with their major non-integrator trade partner.

While AFTA establishment promotes trade flows between the ASEAN-5 and Japan, the bilateral trade linkages between these countries were negatively affected by the eruption of Asian financial crisis in 1997. This financial shock is proxy by a dummy variable (*DUM*). Due to the fact that the impacts of financial crisis on the trade flows of individual ASEAN-5 countries are not exactly the same, five different dummies DUM^k are set up for each country based on the individual response of trade flows to the shock. The notaton k is the same as that of Equation (4) and (5). The estimated coefficients of DUM^k for exports of the ASEAN-5 countries to Japan indicate that the exports, except that of the Philippines, have reduced significantly during the crisis. The similar estimated coefficients for imports show that the imports of all these

countries from Japan were also significantly reduced by the crisis. Nonetheless, this negative impact was only temporary, and the trade flows recovered in 1999.

The long-run estimated coefficients, or elasticities, presented in Table 6 show the following long-run relationships: (i) all the ASEAN-5 exports to Japan are affected by the relative import price of Japan. Among others, the estimated coefficient for Thailand is the highest, -2.607 (at 1% significance level) indicating that the Thailand's export to Japan are relatively more price elastic then the rest. This could be due to the fact that even though Thailand's export to Japan

Table 6
ASEAN-5 Export Flows to Japan
Long-run Estimated coefficients

Country	*Coefficient*				
Variable	*Malaysia*	*Singapore*	*Thailand*	*Indonesia*	*Philippines*
GDP^J	1.058**	-0.304	0.164	0.530***	0.136***
P^{Jm}	-0.705*	-1.308**	-2.607***	1.104***	-1.218***
FDI^k	0.123	0.629**	0.153**	0.475**	-0.019
$AFTA^k$	0.216**	0.135**	0.099*	0.154**	0.345***
DUM^k	-0.118*	-0.187**	-0.084**	-0.113***	0.012

Note: ***p <0.01, ** p<0.05, * p<0.10

Table 7
ASEAN-5 Countries Import Flows from Japan
Long-run Estimated coefficients

Country	*Coefficient*				
Variable	*Malaysia*	*Singapore*	*Thailand*	*Indonesia*	*Philippines*
GDP^k	1.709***	0.4512**	1.505***	0.318**	-0.114
P^{Jx}	-9.806***	-2.508*	0.575	-1.505***	-0.416
FDI^k	0.265*	0.598***	0.339***	0.258***	0.699***
$AFTA^k$	0.389***	0.103**	0.444***	0.142*	0.572**
DUM^k	-0.284***	-0.147**	-0.152***	-0.267**	-0.183*

Note: ***p <0.01, ** p<0.05, * p<0.10

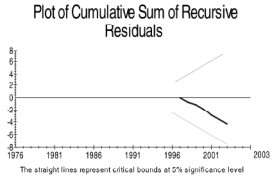
Table 8
Exports of ASEAN-5 to Japan by Commodity

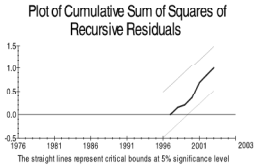
	Malaysia		*Indonesia*		*Philippiness*		*Singapore*		*Thailand*	
Commodity	*1990*	*2002*	*1990*	*2002*	*1990*	*2002*	*1990*	*2002*	*1990*	*2002*
Food Stuff	1.9	1.3	6.1	7.3	31.4	10.8	4.1	3.7	36.5	21.7
Raw Materials	41.0	6.4	7.1	11.8	31.1	4.7	3.4	1.8	15.5	5.5
Mineral Fueis	37	27.2	71.1	46.6	2.1	0.6	41.1	4.2	0.006	0.4
Chemicals	2.4	4.7	0.4	2.7	2.6	0.6	12.5	12.3	2.6	4.4
Textiles	0	1.6	0	3.1	0	2.0	0	0.1	0	3.3
Non-metallic Mineral Products	0	0.8	0	0.5	0	0.4	0	0.4	0	2.2
Metal Products	0	1	0	2.3	0	1.2	0	0.6	0	3.5
Machinery & Equipments	8.8	44.7	0.4	11.4	12.0	71.3	25.5	60.9	16.4	43.2
Others	8.9	12.3	15	14.3	20.6	8.4	13.2	16.1	29.1	15.9
Total	100	100	100	100	100	100	100	100	100	100

Source: ASEAN-Japan Centre (http://www/asean.or.jp/general/statistics/03trade/02-16.html)

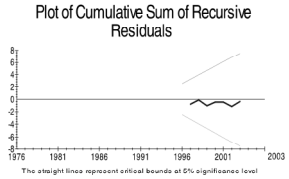
Figure 4: Plot of CUSUM and CUSUMSQ (Stability Test) of the ARDL Models

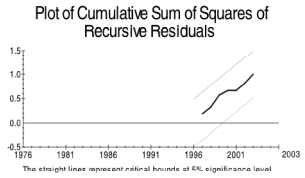
Malaysia exports to Japan



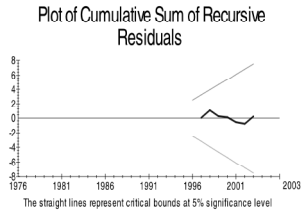


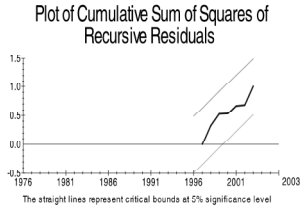
Singapore exports to Japan



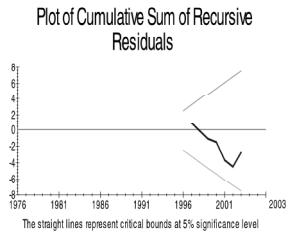


Thailand exports to Japan





Indonesia exports to Japan



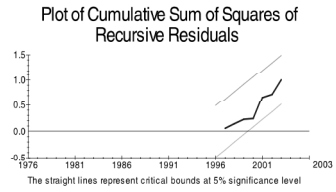
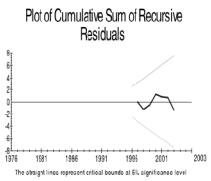
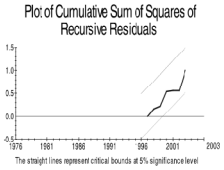


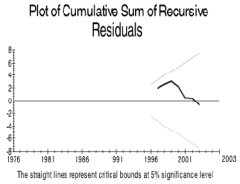
Figure 4 (Continued)
Plot of CUSUM and CUSUMSQ (Stability Test) of the ARDL Models

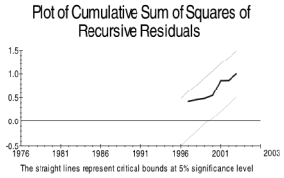
The Philippines exports to Japan



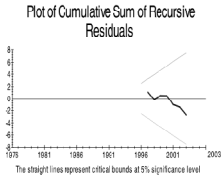


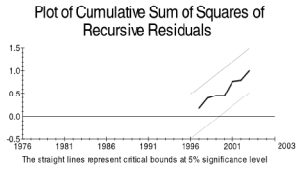
Malaysia imports from Japan



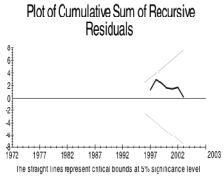


Singapore imports from Japan





Thailand imports from Japan



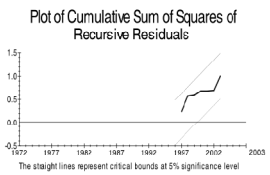
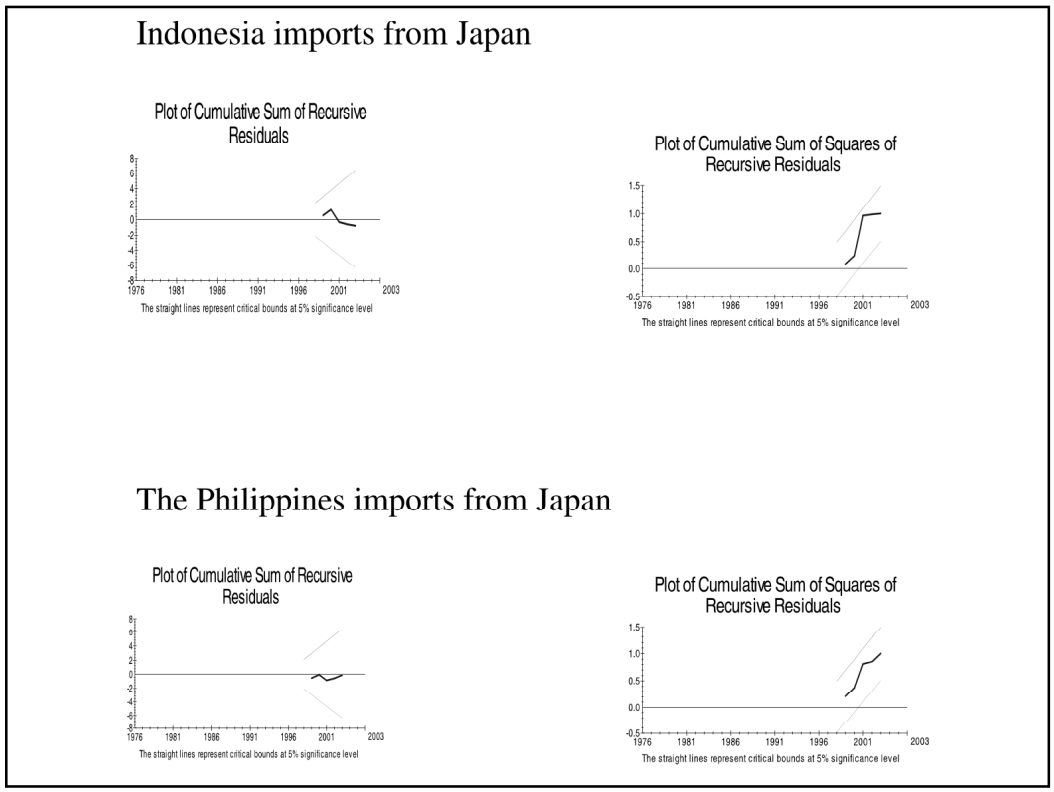


Figure 4 (Continued)
Plot of CUSUM and CUSUMSQ (Stability Test) of the ARDL Models



consists of 43.2% of machinery and equipment, it has 21.7% of food stuff in the total export. Among all, the Malaysian export to Japan is the least price elastic. (ii) the exports from Malaysia, Indonesia and Philippines to Japan are significantly affected by the Japanese GDP. Among others, the Malaysian export to Japan is relatively more income elastic as compared to its ASEAN-5 counterparts. (iii) All of the ASEAN exports are positively affected by the Japan FDI to the countries, except Malaysia and the Philippines. The Philippines is, so far, receives the least direct investment from Japan.

The estimated coefficients in Table 7, on the other hand, show that (i) all the ASEAN-5 imports from Japan are affected by the Japanese relative export price, except for the Philippines and Thailand. (ii) The GDP of ASEAN-5 countries affects imports from Japan positively, except the Philippines. (iii) The Japan FDI to the ASEAN-5 has significant influence on the countries' imports from Japan, except for Malaysia, where the estimated coefficient is weakly significant at the 10% level. The imports of ASEAN-5 from Japan are mainly machinery, in particular, electrical machinery, and transportation equipments.

The short-run dynamic relationships of these variables are determined by the estimated coefficients of the first differenced variables reported in Table 2 and 3. In the short run, both

the exports of ASEAN-5 to Japan and the imports of ASEAN-5 from Japan are significantly affected by the relative export and import prices of Japan, the GDP of Japan, the GDP of ASEAN-5, and the Japanese FDI in the ASEAN-five.

4. CONCLUSION

The ASEAN-5 countries have put in good efforts to enhance its economic efficiency and competitiveness by sustaining economic growth, strengthening regional integration and deepening economic interdependence outside the region. Japan, as one of the largest trade and economic partners to the ASEAN-5 countries, definitely deserves a considerable attention in terms of its trade creations and economic linkages with these countries, in particular after the establishment of AFTA. It is crucial to find out whether the establishment further enhances trade creation between Japan and the ASEAN-5, or it is the trade diversion between the countries, instead. By looking at the time plots of exports and imports between ASEAN-5 and Japan (see Figure 1 and 2), we can observe that even though the volumes of trade flows in both directions increase over time, they were uplifted significantly in the neighborhood of 1992, when AFTA was put in place. This is clearly observed from the upward tilting of the slopes of the exports and imports between Japan and each of ASEAN-5 country in 1992. The trade flows of Malaysia and Thailand to Japan took off earlier, about a year before the official launching of AFTA. This could be attributed to the pre-AFTA effects. As a whole, the ASEAN regional economic integration has accelerated trade flows of these countries with their major trading partner. This steady upward trend, however, was interrupted by the eruption of the Asian financial crisis. The trend, however, picked up again in 1999, but was not as steady as before due to some global economic problems.

The trade creation between Japan and each ASEAN country is confirmed by the empirical estimated results. These results show that the establishment of AFTA has a positive significant impact on the exports of ASEAN-5 to Japan, as well as the imports of ASEAN-5 from Japan. Among others, the Philippines and Malaysia are identified to be the two most benefited nations in term of export to Japan in the long run. In other words, the establishment of AFTA contributes relatively more for these two countries as compared to other factors in the export and import function. This also suggests that the major commodities that export from these two countries to Japan are of good potentials. The exports of all the ASEAN countries to Japan are sensitive to the Japanese import price. Among others, Thailand's export to Japan is relatively more price elastic then the rest of the ASEAN-5's. This indicates that the Japanese import for food stuff is price elastic. Among all, the Malaysian export to Japan is the least price elastic. This could be attributed to a certain level by the 27.2% of mineral fuel in the Malaysian exports to Japan. The exports of ASEAN-5 to Japan have evolved from mainly raw materials and food stuff to machinery and equipment, in particular electronic and electrical products.

Since the Japan direct investment to the ASEAN-5 contributes positively to the trade flows between Japan and the countries, except for Malaysia and the Philippines who have received comparative little in Japan FDI in the 1990s and 2000s (see Figure 3), it is therefore crucial for these countries to maintain a close and cordial relation in investment with Japan. It is urgent for the ASEAN-5 countries to strengthen its tie with Japan as many Japanese firms are in the process of relocating as well as new establishing of their investments in East Asia, in particular

in China, India and ASEAN. For instance, some Japanese firms have taken "China plus One strategy" as their investment destination. The ASEAN country that emerges as the "One" will tap most of the gains in both FDI and trade with Japan. However, the ASEAN countries, in particular the ASEAN-five should not chase for the same kind of FDI and trade, either with Japan or the rest of the world.

It will be a pareto optimal for the ASEAN-5 countries, if they could cooperate to certain level, perhaps under the ASEAN Industrial Cooperation (AICO) scheme, that trade and investment of each country is developed along niche areas that are different from the rest of the counterparts. The development may also be diversified in multiple layers, meaning that they specialize in industries of different levels of technology and knowledge-based, so that they are complements instead of substitutes to one another in investment and trade with external economies. With this cooperation the establishment of AFTA will be more meaningful to the ASEAN-5 countries.

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