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The Effect of Extensive Margin towards Intra-Industry Trade between Asean-5 and Japan

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This study discusses the extensive effect of margin between ASEAN-5 and Japan during 2000 to 2013. This study used Grubel-Llyod index calculation (IG index) to measure IIT, and calculation of formula by Hummels-Klenow to gauge the extensive margin. The method used in this research is panel data. The cross section of this study is the ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, and Thailand) and the time series are 2000 to 2013. This study provides three hypotheses: (1) GDP positively affects IIT, (2) difference in GDP per capita has a negative effect on IIT, and (3) extensive margin positively affects IIT. The results of this study are as follows: (1) The increase of GDP can elevate IIT, (2) GDP per capita difference does not affect IIT, and (3) extensive increase of margin can decrease IIT.

Key words: *Intra-industry trade, the extensive margin, product differentiation.*

Subject / Object of Research: GDP, the difference in GDP per capita, the extensive margin, ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore and Thailand)

Research Areas: ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, And Thailand

Introduction

International trade is an important factor in promoting economic development, as it will encourage industrialization, transport advancement, globalisation and the presence of multinational corporations. International trade can increase along with the inter-country economic integration. Economic integration also affects the well-being of the people if the state implements a low tariff, because it represents a move toward a better free trade (Salvatore, 2007).

One area successfully conducting economic integration is the ASEAN *(Association of South East Asian Nations /* Association of Southeast Asian Nations), which was established on the 8th August 1967 in Bangkok and consists of Indonesia, Malaysia, Philippines, Singapore and Thailand, followed by state Brunei Darussalam, Vietnam, Laos, Myanmar and Cambodia. Along with the development of the world economy, the head of state and head of government of ASEAN member formed a free trade area called the AFTA *(ASEAN Free Trade Area),* established on the 28th January 1992. One of the important agreements is the AFTA *Common Effective Preferential Tariff* (CEPT), which is an agreement on tariff elimination to increase the free flow of goods between ASEAN member countries.

Japan is ASEAN's second largest trading partner after China, with total bilateral trade amounted to 263 billion dollars in 2012 (Asiapathways, 2013). Japan is also a source of foreign direct investment (FDI, *Foreign Direct Investment),* the largest ASEAN. Japanese FDI in ASEAN was as much as 122 billion dollars in 2012 (Asiapathways, 2013). Since 1973, Japan and ASEAN member countries continue to establish relations of economic cooperation so that there will be economic interdependence between them (Sato, 2014).Among the ten ASEAN countries, the ASEAN-5 (Indonesia, Malaysia, Philippines, Singapore, and Thailand) has the largest or the most active trade in international trade than other ASEAN countries (Brunei Darussalam, Cambodia, Laos, Myanmar and Vietnam).

Based on the above background, this study examines the effect of extensive margin on IIT. To our knowledge, there is little research that examines these two variables relations, especially in ASEAN countries with Japan as ASEAN trade partners. This research is a development of research conducted by Yoshida (2012) in the case of ASEAN countries. ASEAN-5 was chosen because it has been established since 1967 and it has bigger trade value than other ASEAN countries (Brunei Darussalam, Cambodia, Myanmar, Laos, and Vietnam). In addition, the availability of data is also a factor of consideration in selecting ASEAN-5. Intra-industry trade is important in international trade because it can generate profits from economies of scale. That is, every company or factory in a country can produce only one or at least some type of model or product of the same type, thereby earning a low production cost. If a country produces only a few types and models, a more specialised and faster used machine can be developed to produce goods.

Literature Review

International trade consists of inter-industry trade *(Inter-Industry Trade)* and intra-industry trade (IIT, *Intra-Industry Trade).* Inter-industrial trade occurs when more than one country trades with products that have a comparative advantage in different sectors, whereas intra-industrial trade occurs when more than one country trades with products that have a comparative advantage in the same sector or industry classification (Salvatore, 2007).

Extensive margin is an advantage of exporting more diverse products (Yoshida, 2012), in the sense of exporting a wide range of products. Yoshida (2012) conducted a research using the Hummels and Klenow extensive margin calculation (2005), in which the margin is calculated based on the subtotal extensive regional exports (for all categories of products) to total exports of the region, with the assumption of $1 < X_{ijk} > 0$.

This research is supported by some previous research. First, Yoshida (2012) investigated intra-industry trade in sub-regions within a country using the Grubel-Lloyd index for intra-industrial trade for 41 regions of Japan with Korea during the period of 1988 - 2006. Yoshida's research found that the increase of sub-regional intra-industrial trade was driven by the introduction of various exports of new products.

The second study was conducted by Turkcan and Yoshida (2010), who examined the contribution of extensive margin on trade variations in IIT in the US motor vehicle industry *(auto industry)* during the period of 1996-2008. They found that the extensive margin can increase the IIT in the US for automobile components industry *(auto parts)*,but decreases the ITT for the motor vehicle industry *(motor vechiles)*. The Turkcan and Yoshida research explains that extensive margins have a major impact on auto industry exports. Moreover, Turkcan and Yoshida (2010) added more explanatory variable, i.e. GDP of each country, DGDPPC *(difference GDP per Capita)*, namely the difference in GDP per capita between the United States and trading partners and DIST (distance) geographically. The result is that GDP has a positive and significant effect on motor vehicle IIT only, while DGDPPC has a negative and significant effect on IIT of motor vehicle industry and automobile component. The distance variable indicates a negative and significant relationship to IIT of motor vehicles and vehicle components.

The third study was by Sawyer et al (2010), who examined the determinants of intra-industry trade in Asia. The results of the study indicate that R & D and MANU variables are positively related to IIT; DIST variable is negatively associated with IIT; the GDP variable has a negative effect with the IIT of the AFTA variable; SAPTA and ECOTA have positive effect on IIT; and the DGDPPC variable is not significant against IIT in Asia. This is because the two trading countries have considerable GDP per capita differences. Many empirical studies have proved that IIT tends to be high if the two trading countries have nearly equal GDP per capita. In addition, GDP per capita describes the level of economic development, consumer behaviour, and factors of production. The greater the GDP per capita difference between the trading countries, the more it supports the comparative trade, not the intra-industry trade.

Research Methods

Variable Identification

Variables of this research consist of independent variables and dependent variables.

1. The dependent variable *(dependent):* IIT between ASEAN-5 (Indonesia, Malaysia, the Philippines, Singapore, and Thailand) with Japan (IIT)
2. The independent variable *(independent):*

1. GDP of each ASEAN-5 country (GDP)
2. Difference in GDP per capita between Japan and each country in ASEAN-5 (DGDPPC)
3. Extensive margin of ASEAN-5 countries with Japan (EXTM)

Operational Definition of Variables

The definition of operational variables is an explanation of the variables in this study. The definition of variables used in this study is as follows:

1. *Intra-Industry Trade* (IIT)

The IIT in this study selected the ASEAN-5 countries (Indonesia, Malaysia, Philippines, Singapore, and Thailand) with Japan during the period 2000-2013. Industry data were obtained from UN Comtrade *(United Nations Commodity Trade)* at the HS 2-digit. The selected industries are industries actively traded ASEAN-5 with Japan:

A. Automotive (HS 87)
B. Textile (HS 63)
C. Chemicals (HS 29)
D. Paper (HS 48)
E. Meat (HS 16)
F. Fish (HS 03)

2. *Gross Domestic Product* (GDP)

2000-2013 GDP data in each of the ASEAN-5 and Japan were obtained from the internet / web, namely *the Global Economy* (www.theglobaleconomy.com). The GDP used is the real GDP of the US dollar (US $).

3. *Difference* GDP *per Capita* (DGDPPC)

GDP per capita of each ASEAN-5 and Japan was obtained from the internet/web, namely *the Global Economy* (www.theglobaleconomy.com). GDP per capita used is GDP per capita in US dollars (US $) in 2000-2013.

4. *Extensive Margin* (EXTM)

This study selected all product categories for extensive margin. Extensive margins can be calculated by measuring the ASEAN region's total exports of ASEAN-5 regions for all product categories against the total exports of the ASEAN-5 region with Japan from 2000-2013. The size of this margin's extensive value is either a ratio or a percentage. Extensive margin values between 1 and 0. The margin obtained extensive data from UN Comtrade *(United Nations Commodity Trade)* at the HS 2-digit in all categories of products, in 2000 and 2013.

Data Panel Regression Method

The analytical technique used to estimate this research is panel data regression, i.e. data that combine cross-section data and time-series data. Cross section in this research is 5 (each country of ASEAN-5) and the time series are as many as 14 (year 2000 - 2013). Merging the cross section and time series data produced 60 observations. Panel data can be estimated by using three approaches, namely Common Effect, Fixed Effect, and Random Effect.

F-Statistic Test (Chow Test)

Chow test is used to know whether the model of Common Effect or Fixed Effect model is good to use by looking at residual sum of square (RSS). The F test is shown in the following calculation:

$$F = \frac{(RSS_1 - RSS_2)/(m)}{(RSS_2)/(n-k)} \quad \text{......}(3.4)$$

Note:
RSS_1 = residual sum of the square without a dummy variable (common effect)
RSS_2 = residual sum of the square with a dummy variable (fixed effect).
M = number of retreats (cross section - 1)
N = number of observations
K = number of parameters in the model

The null hypothesis is that if F statistic is greater than F table at the confidence level (á) 1%, 5%, or 10%, the null hypothesis is rejected. It means that the intercept value is not the same, so the model used is FEM.

Hausman Test

Hausman test is used to determine whether the *fixed effect* model or *random effect* models are good to use. There are two things to consider in choosing one of the two models:

1. If there is a correlation between e_{it} and the independent variable (X), the exact model used is the random effect model. Conversely, if there is no correlation between e_{it} and X, then the right model used is the fixed effect model.
2. If the samples are taken only a small part of the population, it will get an error (e_{it}) which is random, so that the right model used is the random effect model.

The Hausman test is used to determine between the Fixed Effect model and the Random Effect model by looking at chi square probabilities with confidence level (á) in EViews. The null hypothesis is that if the probability value of chi square> á, H_0 is accepted, and the right model is Random Effect. If the value of chi-square probability is <á, H_0 is rejected, and the right model is Fixed Effect.

Hausman calculation begins by setting up the data pool and writing the command Eviewsnya, with the command to Hausman test as follows:

```
Matrix b_diff = b_fixed – b_gls
Matrix v_diff = cov_fixed – cov-gls
Matrix H = @transpose(b_diff)*@inverse(v_diff)*b_diff
```

Test of R^2 Determination Coefficient

R^2 measurement is made to show how much variation of the dependent variable can be explained by the independent variable. Problems in R^2 is rated R^2 are always rising or its value rises in every addition of independent variable in the model. Therefore, many researchers advised to use alternative to using *R-Square Adjusted (R^2 adjusted).* However, the value of R^2 can be *adjusted* up or down with the addition of a new variable, depending on how big the correlation between the additional independent variables with the dependent variable. The value of R^2 *adjustment* may be negative, meaning that the value is considered to be 0, or the independent variable is utterly incapable of explaining the variance of the dependent variable.

The value of R^2 or R^2 *adjusted* is between 0 and 1. The closer to 1 is the better, eg. R^2 value of 0.7256 means that the 36 ability of independent variables in explaining the dependent variable is equal to 72.56%, and the remaining 27.44% is explained by variables outside the model.

Statistics Test

The statistical test for each variable and each period of research is done by the following methods (Widarjono, 2007):

1. Partial Significance Test (t-test)
The t-test is an individual test of variables. T-test is done to see how big the influence of independent variable to individual bound variable. The hypothesis in t-test is as follows:

$$H_0 : \hat{a}_1 = 0,\ i = 0,\ 1, 2,\ \ldots n$$

$$H_1 : \hat{a}_1 \neq 0$$

The null hypothesis is that the independent variable has no effect on the dependent variable (= 0). Meanwhile, the alternative hypothesis stated that each independent variable can have a positive or negative effect on the dependent variable, where the value of the dependent variable coefficient is not equal to zero $\neq 0$). The value of t arithmetic or t statistics can be found with the following formula:

$$t = \frac{\hat{a}_1 - \hat{a}_1^*}{se(\hat{a}_1)} \qquad \text{(3.6)}$$

$\hat{a}_1^*$ is the value of the null hypothesis, which is zero. The t-test is done by comparing t statistics with t table. If the t count> t table, then H_0 is rejected or H_1 is accepted, meaning that there is a relationship between independent variable and the dependent variable. Conversely, if the value of t <t table, then H_0 is accepted or H_1 is rejected, meaning there is no relationship between independent variable and the dependent variable.

In addition to comparing the t statistic with t tables for hypothesis, t-test can be done by comparing the probability value (p-value) with significant value or level of confidence (á). If the p-value <á, then H_0 is rejected or H_1 is accepted, meaning that individually the dependent variable has relationship with independent variable with confidence level of 1%, 5%, and 10%.

2. Simultaneous significance test (F test)
F Test is a measurement of the influence of all independent variables on the dependent variable. Or, it is done to determine the level of significance of independent variables and

variables bound together or as a whole. The value of F arithmetic or F statistics can be found with the following formula:

$$F = \frac{R^2/-(k-1)}{(1-R^2)/(n-k)} \quad \text{......(3.7)}$$

Where k is the number of estimation parameters including intercept, and n is the number of observations.

If the F count> F table, then H_0 is rejected or H_1 is accepted, meaning that the independent variables together affect the dependent variable. The hypothesis in the F test is:

$$H_0 : \hat{a}_1 = \hat{a}_2 = \dots = \hat{a}_n$$

$$H_1 : \text{paling tidak ada salah satu } \hat{a} \text{ tidak sama dengan nol}$$

H1: at least there is one â which is not equal to zero

In addition to comparing F statistic with F table, the F test hypothesis can be done by comparing the probability value of F statistic (p value) with significance value or confidence level (á). If the p-value <á, then H_0 is rejected or H_1 is accepted, meaning that the dependent variable jointly affects the independent variable with a confidence level of 1%, 5% and 10%.

Discussion

Referring to the *United Nations Commodity Trade* Data *(2014),* among the five ASEAN countries Thailand is the highest total against Japanese trade among other ASEAN-5 during 2002 to 2013. In 2001, Malaysia occupied the highest trend followed by Singapore. From 2008 to 2013, Indonesia occupied the second highest trend after Thailand (except in 2009). Growth of ASEAN-5 GDP during 2000-2013 period continued to increase from year to year: Indonesia ranked first, followed by Thailand, Malaysia, Singapore, and the Philippines. During the period 2000 to 2013, Japan's GDP per capita always showed a high trend and was never less than GDP per capita of ASEAN-5. Japan's GDP per capita was 33,900 dollars to 37,400 dollars. Among the five ASEAN countries, there is Singapore. This is because Singapore's residents are less in number compared to those of other ASEAN-5 countries *(The Global Economy,* 2014). Intra-industry trade (IIT) has become important throughout Asia as a result of the rapid growth of Asian economies and their key role in the split of international production or trading activities in the same industry (Krugman, 1979 in Sato (2014). IIT of ASEAN-5 with Japan during 2000 to 2013 experienced fluctuations.

According to the calculations of Hummels Klenow in Yoshida (2012), the extensive value of margins ranges from 0 to 1. This value indicates a ratio or a percentage. Extensive margin of the five ASEAN countries was not too high during the period 2000 to 2013, where the value is far below 1, i.e. only about 0.05 (5%) to 0.58 (58%). Among the five ASEAN countries, the Thai state has the highest value of extensive margin, which is about 0.3 to 0.5. Indonesia has the second highest value of the extensive margin after Thailand, which is about 0.1 to 0.4, and the three other ASEAN countries have very low extensive margin values at 0.04 to 0.1 *(United Nations Commodity Trade*, 2015).

Research Results

The purpose of this study was to determine the effect of extensive margin on intra-industry trade. This research uses panel data analysis tool. The relationship between the three independent variables with the dependent variable in this study can be found by using *EViews 8.* Panel data are estimated using three models: *Pooled Least Square* (PLS), *Fixed Effects Model* (FEM), and *Random Effects Model* (REM). Panel data in this study used a confidence level (á) of 5%.

Table 1: Estimation by Using Panel Data

Variabel	PLS		FEM		REM	
	koefisien	probabilitas	koefisien	probabilitas	koefisien	probabilitas
GDP	0,068386	0,0000	0,286647	0,0008	0,304067	0,0002
DGDPPC	-0,011326	0,7206	-0,052539	0,3610	-0,01521	0,7372
EXTM	-1,911354	0,0000	-0,979029	0,3321	-2,04866	0,0001

Description: Result of Estimation by using EViews 8

The results of the panel data estimation using *Pooled Least Square* (PLS) in Table 1 show that the GDP variables have positive and significant relation at a coefficient of 0.068. DGDPPC *(Difference GDP per Capita)* variables have negative relation and no significance at the coefficient of -0.0113. EXTM *(Extensive Margin)* variables are significantly and negatively related at the coefficient of -1.91.

After the estimation by using *Pooled Least Square* (PLS), the next estimation used *Fixed Effect Model* (FEM). The results of the panel data estimation using a *Fixed Effect Model* (FEM) in Table 1 show that the GDP variables have positive and significant relation in a coefficient of 0.286. DGDPPC *(Difference GDP per Capita)* variables have negative relation and no significance at the coefficient of -0.0525. EXTM *(Extensive Margin)* variables are significantly and negatively related at the coefficient of -0.979. After estimation by using *Fixed Effect Model* (FEM), we then estimated using *Random Effect Model* (REM). The results of the panel data estimation using *Random Effect Model* (REM) in Table 4.1 show that the GDP variables have positive and significant relation in a coefficient of 0.304. DGDPPC *(Difference GDP per Capita)* variables have negative relation and no significance at the coefficient of -0.015. EXTM *(Extensive Margin)* variables are significantly and negatively related at the coefficient of -2.048. After the results were obtained from each model, the next test was a Chow test. The Chow test is performed to determine whether it is PLS or FEM. The results of the Chow test in this study are as follows.

Table 2: Chow Test Results with Eviews

Effects Test	Prob.
Cross-section Chi-square	0,0030

Chow test results in Table 4.2 show that the chi-square probability <á, meaning that H_0 is rejected, so the right model used is FEM. After the Chow test, the next step was performing a Hausman test to determine whether it is FEM or REM. The results of Hausman test in this study are as follows.

Table 3: Results of the Hausman Test in EViews

Test Summary	Prob.
Cross-section Random	0,3655

Hausman test results in Table 3 show that the probability of chi-square> á, meaning that H_0 is received, so the right model used is REM. Because the selected model is REM, the model of Random Effect is as follows:

ITT = -2.614534 + 0.304067 GDP – 0.015214 DGDPPC – 2.048668 EXTM……………...(1)
prob (0.0057) (0.0002) (0.7372) (0.0001)
R^2 0.322978
Prob (F Statistic) 0.000010

The estimation results on *the Random Effect Model* suggest that GDP variables have positive and significant effect at the coefficient of 0.304. This means that if GDP rises by 1%, the IIT also rises by 0.30%. DGDPPC *(Difference GDP per Capita)* variables have negative relation and no significance with a coefficient of -0.015. This means that the GDPPC variables have no effect on IIT. Meanwhile, the variable EXTM *(Extensive Margin)* indicates negative and significant relationship at the coefficient of -2.048. This shows that if the EXTM increases by 1%, the IIT will decrease by 2.048%. The results show that the relationship between GDP and IIT variables is in accordance with the hypothesis, but the relationship of DGDPPC and EXTM variables with IIT is not in accordance with the hypothesis.

Testing Coefficient Determination R^2

The test statistics for each variable and each period require the measurement of R^2 determination coefficient. In *Random Effect* model, it is shown that the R^2 value is 0.32, which means that the independent variables can explain the dependent variable of 32% and the rest is explained by other variables outside the model.

Simultaneous Testing of Statistics (F statistics)

The extent of the influence of all independent variables on the dependent variable can be determined by using the F test or by comparing statistical probability *(p-value)* F statistics with a confidence level (á) of 5%. The null hypothesis is that if the *p-value* <á, then H_0 is rejected or H_1 is accepted. It means all the independent variables influence the dependent variable. F statistic on the model *Random Effect* is 0.000010 and F statistic 0.000010 <á, meaning that all the independent variables influence the dependent variable.

Testing Statistics Partial (t statistic)

To know the influence of the independent variable on individual dependent variable is by using the *t* test or by comparing statistical probability *(p-value)* with a confidence level (á) of 5%. *T* test results on the *Random Effect* models indicate that GDP variable has a probability value of 0.0002. The probability is 0.0002 <á, so the null hypothesis is rejected, meaning the GDP variable individually affects IIT. The DGDPPC variable has a probability value of 0.7372. Probability is 0.7372> á, so the null hypothesis is accepted, meaning the GDP variable individually does not affect the IIT. Variable EXTM has a probability value of 0.0001. The probability is 0.0001 <á, so the null hypothesis is rejected, meaning the EXTM variable individually affects IIT.

Model Analysis

After the Chow test and Hausman test, the model used is *Random Effect,* with the following model analysis.

$Y_{it} = \hat{a}_0 \quad \hat{a}_1 \quad + \quad \hat{a}_2 \; LnGDP_{it} + \quad \hat{a}_3 \; LnDGDPPC_{it} + \quad EXTM_{it} + e_{it}$ ……………………….(2)

The estimation results on *the Random Effect Model* suggest that GDP variables have a positive and significant effect at the coefficient of 0.304 (Table 1). This means that if GDP rises by 1%, IIT also rises by 0.30%. DGDPPC *(Difference GDP per Capita)* variables has negative relation and no significance with a coefficient of -0.015 (Table 4.1). This means that DGDPPC variable has no effect on IIT. Meanwhile, the EXTM *(Extensive Margin)* variables indicate negative and significant relationship to the coefficient of -2.048 (Table 1). This shows that if the EXTM increases by 1%, the IIT will decrease by 2.048%. The results show that the relationship between GDP and IIT variables is in accordance with the hypothesis, but the relationship of DGDPPC and EXTM variables with IIT is not in accordance with the hypothesis.

Intra-industry trade is a two-way trade in products that belong to the same industry classification. Intra-industrial trade aims to derive benefits from economies of scale demonstrated by lower production costs of similar trade products. The lower production cost of a similar product trade is done by the company limiting its product type. When a country produces only a few types and models, a more specialised and faster used machine can be developed to produce an item for a long time. In addition, the country may also import similar items from other countries. The benefits of intra-industry trade will benefit consumers as more choices are made (more differentiated product types) at lower prices due to economies of scale (Salvatore, 2007).

Random Effect Models that have been selected in this study show that the extensive margin has negative and significant effect on IIT. Although the data obtained in the study suggest that over the period of 2000-2013 the value of ASEAN-5 imports was greater than that of Japan, a differentiated product increase also affected the relationship between the two variables. As Turkcan and Yoshida (2010) argued, differentiated products in the country can reduce IIT, so it can be said that negative relationship between these two variables is because the differentiated domestic products in ASEAN-5 is increasing.

Yoshida (2012) measures extensive margin on the basis of Hummels-Klenow calculations, where the margin's extensive measurement is the region's export sub-total (exports by ASEAN-5 countries) to Japan to total exports of ASEAN-5 regions to Japan in all product categories. Therefore, this study selects all product categories for extensive margin, so as not to differentiate industry groups and assumes an extensive range of margins ranging from 0 to 1. It means that the closer the extent of margin to one, the greater the opportunity for the country to export more diverse goods. Extensive margin of the five ASEAN countries was not very high during the period 2000 to 2013 (figure 4.13), where the value is far below 1, i.e. only about 0.04 (4%) to 0.58 (58%). The least extent of this margin is because the countries of origin (ASEAN-5) exported less diverse goods than similar goods. The meaning of Extensive Margin is exporting more diverse products or exporting various products (Yoshida, 2012).

In this study, GDP has a positive and significant impact on IIT, whereas a country with large GDP can increase IIT. This is due to the fact that during the period of 2000 to 2013, the GDP of ASEAN-5 was increasing. With the increase of ASEAN-5's GDP, the ASEAN-5 can also produce more diverse goods in each industry, so that it can increase IIT. In addition, the difference in GDP per capita difference (DGDPPC) is also used as a determinant of IIT.
DGDPPC in this study had no significant or significant effect on IIT. This is because the GDP per capita gap between ASEAN-5 and Japan is huge. The greater the difference in GDP per capita between the trading countries, the more it supports the comparative trade, not the intra-industry trade (Ito and Umemoto, 2004). The GDP per capita gap between ASEAN-5 and Japan is big, which is more than 10,000 dollars (except Singapore). Singapore has the greatest GDP per capita, so the GDP per capita difference between Singapore and Japan is not too big compared to other ASEAN-5 countries.

Conclusion

This study examines the intra-industry trade and the extensive margin between ASEAN-5 and Japan. The two countries were selected because ASEAN-5 is the second largest trading partner after China. During the period 2000 to 2013 the total trade of ASEAN-5 with Japan tend to rise except in 2009. Based on the findings, the study draws the following conclusions:

First, EXTM *(Extensive Margin)* variables have a significant negative effect on the IIT. The negative correlation between the two variables is due to the increase of domestic product differentiation in ASEAN-5 (Turkcan and Yoshida, 2010).

Second, GDP *(Gross Domestic Product)* variables are significantly and positively related to IIT. This means that the ASEAN-5 have a big GDP enabling it to produce more diverse goods in every industry, because theoretically the countries with larger GDP will produce more diverse goods in every sector, leading to high IIT (Sato, 2014).

Third, DGDPPC (*Difference GDP per capita*) variables has negative relation and no significance to IIT. It is in line with the research conducted by Sawyer et al (2010) that the larger the difference in GDP per capita between countries that trade, the more support for the comparative trade, not intra-industry trade (Ito and Umemoto, 2004).

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