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Trade Diversion and Trade Creation Effects from ASEAN-East Asia Free Trade Area

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1. Introduction

According to World Trade Organization (WTO) database, proliferation of regional trade agreement (RTA) was particularly notable during the years of 2008 until 2015 with the number of RTAs, including Free Trade Area (FTA), in force ranging from 15 to 30 per year.[1] As of 2019, 138 out of 312 RTAs currently in force and notified to WTO in the world covers Asian economies.[2] At the heart of Asian regionalism is Association of Southeast Asian Nations (ASEAN) that was established in 1967, covering economic, social, cultural, technical, scientific and administrative cooperation among Brunei Darussalam (hereafter Brunei), Cambodia, Indonesia, Lao People's Democratic Republic (hereafter Laos), Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam. With the exception of Singapore, all ASEAN members are categorized under the list of *Emerging and Developing* countries, which are characterized by low income per capita and high economic growth. On average, all 10 ASEAN members boast about 5.1% real GDP growth from 2012 to 2016 according to OECD[3], a relatively high number when compared to the world's real GDP growth of 2.7% over the same period.[4]

For the past two decades, ASEAN has managed to form ambitious ASEAN+1 FTAs with their neighboring countries, which are: ASEAN-China FTA (ACFTA), ASEAN-Japan (AJFTA), ASEAN-Korea (AKFTA), ASEAN-Australia-New Zealand (AANZFTA), and ASEAN-India (AIFTA). Among the six neighboring countries, ASEAN has a particularly long-standing relationship with the three northeast Asian countries, namely People's Republic of China (hereafter China), Japan, and Republic of Korea (hereafter South Korea) that continues to be fostered until now, with the ASEAN Plus Three Cooperation (hereafter APTC) currently under discussions. In perspective, each northeast Asian countries are the main trading partners for ASEAN members, with China being the first one, Japan the second after the U.S., and South Korea being the third.[5] Hence, an economic cooperation in the region was to be expected.

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[1] WTO | Regional trade agreements. (2019). Retrieved from http://rtais.wto.org/UI/charts.aspx
[2] From Asian Development Bank FTA database
[3] https://www.oecd.org/development/asia-pacific/01_SAEO2019_Overview_WEB.pdf
[4] Author's calculation from WTO database
[5] Cumulative trade flows in goods: https://data.aseanstats.org/trade-annually

This thesis will evaluate how ASEAN+3 FTAs will affect trade between each partners respectively, focusing on the trade creation and trade diversion effects that might arise from them. Trade creation occurs when preferential tariff agreement (PTA) increases trade between intra-bloc member. With that said, trade creation that results in mutual benefits for all partners is essentially the ultimate goal for any type of PTA that attempt to liberalize trade. However, Viner (1950) raised the issue of possible negative effects that arises from PTA known as trade diversion effect. Due to lower tariffs implemented between intra-bloc members, there could be a diversion of trade from extra-bloc members, whose production cost is lower, to members of the PTA. As a result, members of the PTA have to trade with less efficient producers and this would lead to a reduction in welfare.

All ASEAN+3 FTAs (ACFTA, AJFTA, and AKFTA) have the same objectives:

"(1) Strengthen economic, trade, and investment cooperation, (2) promote trade in goods and services and create a facilitative investment regime, and (3) bridge development gaps between members."

The last objective should be emphasized, seeing how there is substantial difference in development stages of each East Asian countries. In particular, the biggest difference can be seen between Singapore, whose income per capita is US$ 57,714 in 2017, and Cambodia with an income per capita of US$ 1,384 in 2017. Hence, an analysis of how ASEAN+3 FTAs could affect trade will be useful to each countries' ongoing effort in improving their economies.

1. 1. Background of ASEAN+3 FTAs

ACFTA was signed on 4 November 2002, the first ASEAN+1 FTA among East Asian countries. Then, ASEAN and Japanese leaders declared officially in 2002 to establish AJFTA, however, there were delays in the signing of the agreement until 2008, with members having signed the agreement on different dates[6]. Lastly, AKFTA was signed on 13 December 2005. The success of

[6] Brunei on 3 April; Cambodia on 7 April; Indonesia on 31 March; Laos on 4 April; Malaysia on 14 April; Myanmar on 10 April; Phillipines on 2 April; Singapore on 26 March; Thailand on 11 April; Vietnam on 1 April; Japan on 28 March.

other regional arrangements such as the European Union and North American Free Trade Area (hereafter NAFTA) and the lack of cooperation during Asian financial crisis on 1997 until 1998 prompted the surge in ASEAN+3 FTAs. Japan and China were battling to be the front-lines of Asian regionalism, with China being in the lead since discussion between ASEAN and China had been underway since 1999. Hence, other than liberalizing trade, ASEAN+3 FTAs have the objective to help strengthen the members' economic development and strengthen economic integration in the region.

In 2017, China is ASEAN's top trading partner with a trade balance value of about US$ 441 billion. ASEAN's third trading partner is Japan, followed by Korea on the fourth place. ASEAN's three most traded products according to HS-2 code classification to China, Japan, and Korea were electrical machinery and parts (85), nuclear reactors and parts (84), and mineral fuels (27).

2. Literature Review

Several studies in the past had been conducted to identify trade diversion and trade creation effects that arise from the creation of RTAs. These studies are distinguished into two major categories: ex-ante and ex-post. Numerous ex-ante studies use the Computable General Equilibrium (CGE) model to analyze their findings, whilst ex-post studies vary in their methodology, depending on the types of data that they use. In this thesis, the author will focus on analyzing the ex-post effects of FTAs that had taken full effect several years ago. In order to start the analysis, a review of literatures on various FTAs and different focus of types of trade will be carried out.

Romalis (2007) analyzes empirically the effects of NAFTA on North American trade volumes, prices and welfare using annual trade and tariffs disaggregated data of almost 5,000 Harmonized System (HS-6) products from 1989 to 2000 by estimating demand elasticity and inverse supply elasticity. He conducted a difference-in-difference analysis to estimate the demand elasticity substitution of U.S. and EU import sources of the same products. Inverse supply elasticity are estimated by regressing prices of the products on trade quantities and using different tariff

measures as the instrumental variable. Both elasticity estimates are used to compute the impact of NAFTA on trade volumes, prices, and welfare. The result shows that welfare only changes slightly, and Romalis suggested that this is due to trade diversion. In hindsight, the biggest tariff preferences are given to North-American firms that do not have low-cost advantage in the first place. Thus, a reduction in trade barriers between NAFTA countries will only reduce foreign competition and drive up prices of domestic products. Moreover, significant changes in trade volumes were also identified. There is a 23% increase in trade volumes between Mexico and the U.S. and 28% increase between Mexico and Canada attributable to NAFTA. Finally, Romalis did a separate analysis to show that there is indeed a trade diversion, where a 1% reduction in intra-NAFTA tariffs is associated with a 1.3% to 3.9%[7] decline in imports to North America in highly protected sectors.

Similarly, Krueger (1999) identified the impact of NAFTA on trade flows using a much simpler analysis. From 1992 to 1998, where the tariff-phased out period had only been enacted halfway through, she noted that Mexico gained a 4% share of the U.S. import whilst East Asia lost about 2.5% share of the U.S. import, even though the average tariffs collected from both regions fell. On the other hand, she pointed out that Mexico's share of export in maquiladora industry goods to the US also increased along with the share of export to rest of the world following NAFTA, thus, trade creation effect was evidently present. Finally, a pooled time-series-cross-section regression was also conducted and the result shows that members of NAFTA import less from non-members following NAFTA.

On the other hand, focusing more on different classification of countries based on development level, Urata and Okabe (2014) concluded that Regional Trade Agreements (RTA) among developed countries give rise to trade creation for many products in contrast with the prevalent trade diversion effects found among developing countries as a result of RTAs. They cited that the latter was due to the high most-favored nation (MFN) tariffs implemented by developing countries observed from 1988 to 2006. Given that ASEAN countries are comprised of mostly

[7] Amount of trade diversion effect varies depending on the selection of exporting countries used in the estimation

developing countries[8], the author would like to know whether ASEAN+1 FTAs also cause trade diversion.

In addition to all the studies of FTAs formed in the western hemisphere, the author also refers to studies dedicated to ASEAN+1 FTAs. Yang and Martinez-Zarzoso (2014) conducted a panel-data analysis using aggregated and disaggregated sectoral data to identify trade creation and trade diversion effects of ACFTA. Their research shows that the coefficient of the impact of ACFTA on trade varies significantly depending on the model specifications. Unbiased estimates using fixed effects regression, controlling for country-pair and country-time fixed effects, show that ACFTA resulted in a trade creation among intra- and extra-bloc members of ACFTA. Furthermore, Yang and Martinez-Zarzoso did a separate regression on the impact of ACFTA on the trade of agricultural goods and manufactured goods, which is segregated into chemical products and machinery and transport equipment. Taking into account systematic zero trade flows in disaggregated data, they performed multinomial PML regression for each sector. The regression shows a positive trade creation effect for all sectors as a result of ACFTA, with manufactured goods being the most affected.

Taguchi and Lee (2015) did a similar estimation with Yang and Martinez-Zazoso (2014) to identify the trade creation and trade diversion effects from the formation of ASEAN+1 FTAs using data from 1993 to 2013. However, due to different tariff schedules, Cambodia, Lao PD, Myanmar, and Vietnam are excluded from the estimation. Singapore and Brunei Darussalam are also excluded. Their estimation shows significant trade creation and trade diversion coefficients. In their interpretation, they pointed out a larger trade creation effect for ACFTA compared to AKFTA and AJCEP. This is attributable to two factors: (1) larger difference between MFN rate and the average preferential rate for ACFTA, and (2) trade creation effects that could've been absorbed by previous overlapping bilateral FTAs. In contrast with Romalis' (2007) finding where trade diversion arises due to low preferential tariff in NAFTA, there was no substantial difference in trade diversion effects of ACFTA compared to AKFTA and AJTA, despite China

[8] Based on World Economic Outlook country classification database: https://www.imf.org/external/pubs/ft/weo/2018/02/weodata/groups.htm

implementing a considerably lower preferential tariff on ASEAN. The latter finding can be explained by the fact that members of ACFTA are comprised of largely low-cost producers, thus, they're less likely to be affected by changes in preferential tariff.

Additionally, Lee and Shin (2006) analyzed how geographical proximity and common language between members of East Asian RTAs influence the magnitude of trade creation and trade diversion effects, covering 175 countries from 1948-1999. They argued that natural trading partners, defined as countries that share a common language and close geographical proximity (depicted by geographical distance and common border), are more likely to experience trade creation and a reduction in trade diversion after joining RTAs. Their analysis was conducted using a fixed effect regression, including an interaction term between characteristics of natural trading partner and RTA dummy variable as their main variable of interest. The result supports their earlier argument, where lower trade impediments are associated with more trade creation and less trade diversion, thus, RTAs are welfare-improving. Moreover, they added that ASEAN+3 FTA would be beneficial for all East Asian countries because it increases trade within intra-bloc members as well as between intra- and extra-bloc members.

Another study with a particular focus on trade of parts or components after the establishment of ACFTA was conducted by Sheng, Tang, and Xu (2012), covering 117 countries from 1980 to 2008. They argued that due to close production-linkages between China and ASEAN countries where each country is specialized in components of a connected good, increased demand for one component or one final good will create a multiplicative trade creation effect for both intra- and extra-bloc members. After developing a new projection of bilateral trade flows that allow for multiplier effects caused by component trade, they arrive at the conclusion that trade creation effect outweighs trade diversion. Moreover, increased inter-regional trade was found to have caused an increase in trade with extra-bloc members.

Taking into consideration the methodologies and results presented in previous literatures, the author will contribute to the topic in the following ways: (1) provide relevant estimates of trade creation and trade diversion effects of ACFTA, AKFTA, and AJFTA using the most recent data available, encompassing all of the countries associated with the FTAs mentioned earlier, (2)

provide more accurate estimates by incorporating phased-in implementation of FTAs in the model.

3. Theoretical Framework

3. 1. Gravity Model

As discussed earlier, the use of the gravity model is prevalent in ex-post studies. Influenced by Newton's "Law of Gravity", Jan Tinbergen (1962) was the one who proposed a similar gravity equation, in the context of economics, to explain bilateral trade flows that are affected proportionally to the sizes of the two economies and inversely proportional to the trade costs between the two countries. In perspective, as the sizes of the economies (usually proxied by nominal GDP) gets larger, their ability to supply or demand for goods, domestic and foreign, increases. Accordingly, as factors that hinder bilateral trade such as geographical distance increases, trade will decrease.

The general gravity equation can be then written as:

$$X_{ij} = GS_iM_j\phi_{ij} \tag{1}$$

Where i and j represent exporter and importer countries respectively, X_{ij} is the monetary value of exports from i to j, S_i and M_j denote all factors that positively affect exporter and importer's ability to trade with each other respectively, and ϕ_{ij} is the inverse of bilateral trade costs. Whereas G is a "gravitational constant" that does not depend on i nor j.

Despite the model's ability to provide empirically correct explanations for bilateral trade flows, majority of the critics towards gravity model was addressed to the fact that it was not grounded on any economic theories. As more researches are dedicated in finding a more accurate representation of determinants of bilateral trade flows, various improvements to the model were made. One of the most widely acknowledged extension of the model was developed by Anderson and van Wincoop (2003), where they constructed a theoretically correct gravity model under the assumption that each country is specialized in different production of goods and

constant elasticity of substitution preference. In their paper, they found that bilateral trade between *i* and *j* are not only affected by their bilateral trade costs, but their respective trade costs or resistance to trade with the rest of the world as well. Thus, the gravity equation becomes:

$$X_{ij} = \frac{Y_i Y_j}{Y}\left(\frac{t_{ij}}{P_i P_j}\right)^{1-\sigma} \quad (2)$$

Where Y, Y_i, and Y_j denote nominal income for the world, country *i* and *j* respectively, t_{ij} is the bilateral trade cost between *i* and *j*, and $1-\alpha$ is the elasticity of substitution. P_i and P_j represent *i* and *j*'s multilateral resistance term or trade cost with the rest of the world.

In relation with the topic of interest in this thesis, the author will use gravity model as the foundation of the empirical analysis by including FTA dummy variable to the model to indicate the trade creation and trade diversion effects.

3. 2. Trade Creation and Trade Diversion

The concept of trade creation and trade diversion was first popularized in *the Customs Union Issue* by Viner (1950). In the book, Viner argued that customs union will not necessarily result in a beneficial agreement for the parties involved and can prove to have adverse effects, even to countries outside the customs union, due to trade diversion. Trade diversion occurs when a PTA between two countries divert trade away from low-cost producers, referred to as third countries hereafter, to relatively higher-cost producers who belong in the same agreement whose goods' price plus zero tariff is lower than the price plus some amount of tariff imposed by third countries. As a result of trade diversion, there will be some loss borne either by the importing country, the third country, or the whole world overall. Thus, instead of promoting more trade under the elimination of tariff between intra-bloc members, it can be argued that PTA is a move towards a protectionist measure in favor of special interest parties.

The argument that PTA could be a move towards a more protectionist measure is further supported by Bhagwati, Greenaway, and Panagariya (1998) in their attempt to point out the problem of overlapping PTAs around the world, referred to as the "Spaghetti Bowl" phenomenon. In forming a PTA, countries will inevitably discriminate trade from non-members;

one of the ways to do that is to establish a 'rule of origin' of a product. However, seeing as how the rise in global supply chain leads to different stages of production to be done in different countries, it is hard to distinguish the origin of a product and discriminate certain countries without unintentionally increasing the effective rate of protection on the final products. The different tariff reduction schedule that is applied for each country and each type of products complicate things further, resulting in tariffs of components of a product to clash with one another.

Alternatively, Summers (1991) proposed another perspective where regional PTA are beneficial to all parties and can lead to a welfare-improving trade. He argued that because regional PTAs are originally comprised of natural trading partners whose initial trade volumes are large even before the formation of PTA and have low trade costs between each other, there is little chance that trade diversion will prevail over trade creation. Furthermore, he also pointed out that trade diversion can be desirable without reducing welfare of any parties. In his defence, a trade diversion will only generate loss when it diverts trade away from efficient producers to less efficient producers.

4. Methodology

Baier and Bergstrand (2007) and Baldwin and Taglioni (2006) suggested using panel data on the grounds that, after controlling for unobserved time-invariant heterogeneity, they produce the most stable and unbiased average treatment effects compared to pooled cross-section estimation. Referring to Anderson and van Wincoop gravity equation as the baseline model and adding FTA dummy variables, then transforming each variables into natural logarithm for the sake of ease of interpretation, the estimation equation becomes:

$$lnX_{ijt} = \alpha_0 + \beta_1 lnY_{it} + \beta_2 lnY_{jt} + \beta_3 lnt_{ijt} + \beta_4 lnP_{it} + \beta_5 lnP_{jt} + \beta_6 lnFTA\_TC_{ijt} + \beta_7 lnFTA\_TD_{ijt} + \varepsilon_{ij} \quad (3)$$

where α_0 is a constant, β_k are coefficients indicating the effect each variable has on exports value, and ε_{ij} is the error term. Meanwhile, FTA_TC_{ijt} and FTA_TD_{ijt} are dummy variables that

indicate trade creation and trade diversion effects respectively, as a result of ACFTA, AJCEP, and AKFTA respectively. FTA_TC_{ijt} have the value of 1 if exporter *i* and importer *j* belong to the same FTA at time *t*, and zero otherwise. A statistically significant positive coefficient β_6 signifies an increase in bilateral trade between intra-bloc members as a result of FTA. On the other hand, FTA_TD_{ijt} have the value of 1 if exporter *i* belong to a FTA at time *t* and importer *j* does not, and zero otherwise. In this case, a statistically significant negative coefficient β_7 indicates that the formation of FTA leads to less bilateral trade between intra- and extra-bloc members.

The author includes two FTA dummy variables because an interpretation of one of the coefficient on its own is insufficient to determine which trade effect prevails a result of FTA. A positive β_6 does not necessarily mean that FTA prompted trade creation, since a negative β_7 could offset some of those effects. Thus, magnitudes of the trade effects must also be taken into account for a more accurate interpretation, and summation of the coefficients will be used to determine which effect prevails. A positive sum signifies trade creation effect, whereas a negative sum signifies trade diversion effect.

4. 1. Endogeneity Bias

One of the most common mistake in estimating gravity equation is ignoring the endogeneity of FTA dummy variable, thus leading to unbiased estimates of trade effects. In their paper, Baier and Bergstrand (2007) discussed in length about the endogeneity bias specifically pertaining to the FTAs dummy variable and various methods in solving that problem. Endogeneity bias stems from various sources, such as omitted variable bias and unobserved heterogeneity, which will be discussed in the following paragraphs.

First, there are several causes for omitted variable bias, but the one that is heavily discussed in previous literatures pertains to multilateral resistance term. As mentioned previously in the Theoretical Framework section, multilateral resistance term is the average of trade partners' resistance to trade or trade cost with respect to the rest of the world. Intuitively, as two countries' resistance to trade with the rest of the world increases, the more likely it is that the two countries

trade with each other compared to with other countries. Considering that MRT is not an observable variable and omitting such variable will lead to error terms being correlated with the explanatory variables, Baldwin and Taglioni (2006) proposed the inclusion of time-varying country-specific fixed effects as a proxy, thus, effectively removing time-variant country-specific characteristics such as GDP and population from the estimation. Time-varying country-specific fixed effects are in the form exporter-time and importer-time fixed effects.

Second, unobserved heterogeneity such as political motives could influence the decision of countries entering into a FTA. Even though many argue that free trade under a PTA can be beneficial, if done and implemented correctly, the preferential tariff treatment can increase protection for specific industries of goods, as illustrated before in the Trade Creation and Trade Diversion section. That being the case, certain groups might lobby in favor of PTA for their own special interests. In solving this problem, Baier and Bergstrand (2007) suggested using country-pair fixed effects as a proxy. However, using country-pair fixed effects will ultimately remove all time-invariant trade costs variable such as geographical distance, common language, common border, and so on.

4. 2. FTA Variable and Lagged Effects

All FTAs have around 2-3 years of preparation before the agreement is enforced and tariff reduction starts to take into effect. However, due to the binding nature of contracts that requires order of goods to take place 3-6 months in advance, most exporters/importers have already started to react in response to the signing of the agreement even though tariffs have not yet been reduced. Thus, the author decides to take into account the anticipation effects and use the date of the signing as the baseline of the FTA dummy variable. Below are the dates of the signing of each FTA:

Table 1. Date of Signing of ASEAN+3 FTAs

FTA	Date of Signing
ASEAN - China Free Trade Area	4 November 2002
ASEAN - Japan Free Trade Area	2008
ASEAN - Korea Free Trade Area	13 December 2005

Source: ASEAN Free Trade Agreement with Dialogue Partners

Since all FTAs are signed on the last quarter of the year, the FTA dummy variable will take the value of 1 one year after the agreement has been signed. *ACFTA_TC* takes the value of 1 for exporter and importer who are members of the FTA starting from the year 2003, *AJCEP_TC* starting from the year 2004, and *AKFTA_TC* starting from the year 2006. The same rule applies for variable *ACFTA_TD*, *AJCEP_TD*, and *AKFTA_TD* when the exporter *i* is a member of the FTA and importer *j* is not.

In addition to that, according to their respective framework agreements, ACFTA, AJFTA, and AKFTA implemented their tariff reduction schedule gradually, over the course of 10 years. Hence, it is reasonable to assume that the effect of a tariff reduction on trade flows will still persist years following the time of the tariff reduction implementation. To take this into account and avoid less precise estimates, Baier and Bergstrand (2007) suggested including lagged effects FTA dummy variable into the regression. They found that the lagged effects were significant and increases trade flows more than predicted.

Introducing time-varying country-specific fixed effects, country-pair fixed effects and lagged effects of FTA variable to the estimation, the equation becomes the following:

$$lnX_{ijt} = \alpha_0 + \beta_1 lnFTA\_TC_{ijt} + \beta_2 lnFTA\_TD_{ijt} + \beta_3 lnFTA\_TD_{ijt-n} + \gamma_{ij} + \delta_{it} + \zeta_{jt} + \varepsilon_{ijt} \quad (4)$$

Where n indicates the number of time lags used, γ_{ij} is country-pair fixed effects, δ_{it} and ζ_{jt} are exporter- and importer-time fixed effects respectively.

5. Data

The author collects the aggregated trade data of ASEAN countries, China, Japan, Korea, and their main trading partners (see Appendix I Table 7) from 1999 until 2017. The reason why the years preceding 1999 were not included in the estimation was because of the lack of data

available for some countries. Export values, Free on Board, (FOB) in current US$ (*exports*) were extracted from *Direction of Trade Statistics IMF Data*.

In order to give some background on the degree of liberalization of each ASEAN+3 FTAs, the author collected liberalization coverage by type under trade in goods data that were compiled from each ACFTA, AJFTA, and AKFTA's framework agreement of trade in goods respectively from *ASEAN Secretariat*. The author found that all three FTAs cover tariff elimination, rules of origin (ROOs), quantitative restriction, sanitary and phytosanitary measures, safeguards, subsidies and countervailing measures, anti-dumping measures, intellectual property rights, and technical barriers to trade.

6. Result

As mentioned previously in Methodology section, the author decides to include bilateral, exporter-time, and importer-time fixed effects to capture omitted variables. However, it should be noted that exporter-time fixed effects essentially captures the time-varying exporter-specific characteristic, which refers to the trade creation variable (FTA_TC_{ijt}) and trade diversion variable (FTA_TD_{ijt}). Hence, including exporter-time fixed effects causes Stata to automatically omit either one of the trade effects (FTA_TC_{ijt} or FTA_TD_{ijt}) due to collinearity. As a result, Stata has omitted FTA_TD_{ijt} and the author is unable to analyze which trade effects prevail after the implementation of FTAs. The interpretation of FTA_TC_{ijt} variable is only limited to how trade of members of a particular FTA commences after gradual tariff reduction has started to take into effect relative to trade outside of the FTA. The author cannot conclude whether the trade effects was a result of more trade between FTA members (trade creation) or more trade from FTA members to non-FTA members (trade diversion).

Table 2. Fixed effect gravity estimation results

Variable	(1) ACFTA	(2) AJFTA	(3) AKFTA
FTA_TC_{ijt}	0.078	0.116	0.116
	(0.104)	(0.101)	(0.094)
FTA_TC_{ijt-1}	-0.058	-0.099	0.066
	(0.130)	(0.122)	(0.129)

FTA_TC_{ijt-2}	-0.145	-0.054	-0.179*
	(0.098)	(0.085)	(0.102)
FTA_TD_{ijt}	*(omitted)*	*(omitted)*	*(omitted)*
Constant	6.460	6.462	6.459
R2	0.975	0.975	0.974
No. observations	14,587	14,587	14,587

Notes: Panel regression includes bilateral fixed effects, exporter-time fixed effects, and importer-time fixed effects. Robust standard errors are used.

* $p < 0.1$

Result of the fixed effect estimation is depicted in Table 2. The result shows only one significant result, pertaining to the second lagged variable of AKFTA's trade creation effect (FTA_TC_{ijt-2}). In order to interpret the coefficient correctly, we need to take into account all AKFTA's trade creation effect variables (FTA_TC_{ijt} and FTA_TC_{ijt-1}) by taking a summation of all the variables. The result was 0.003, which signifies there's relatively 0.30% {=[exp(-0.179)-1]*100} more trade between AKFTA members compared to trade with non-AKFTA members. The rest of the coefficients are not significant and will be discussed more extensively in the next section.

7. Discussion

In order to discuss the result properly, the author will take a look at two possible explanations. The first one is from the extent of liberalization of each FTAs and how it influences trade. Tariff elimination coverage rates of each ASEAN+3 FTAs were extracted from Kuno's (2011) calculation from *Constructing the Tariff Dataset for the ERIA FTA Database* paper published on Economic Research Institute for ASEAN and East Asia (See Table 3). From the data, we can infer that the aggregated tariff elimination coverage rates exceeded 90% for almost all countries, except for Cambodia under AJFTA and Vietnam under AKFTA. When looking at the aggregate rates, a more than 90% tariff elimination is not an insignificant amount and would reasonably alter trade between countries. However, from the result of the regression presented in the previous section of this paper, no significant changes in trade was found for ACFTA and AJFTA.

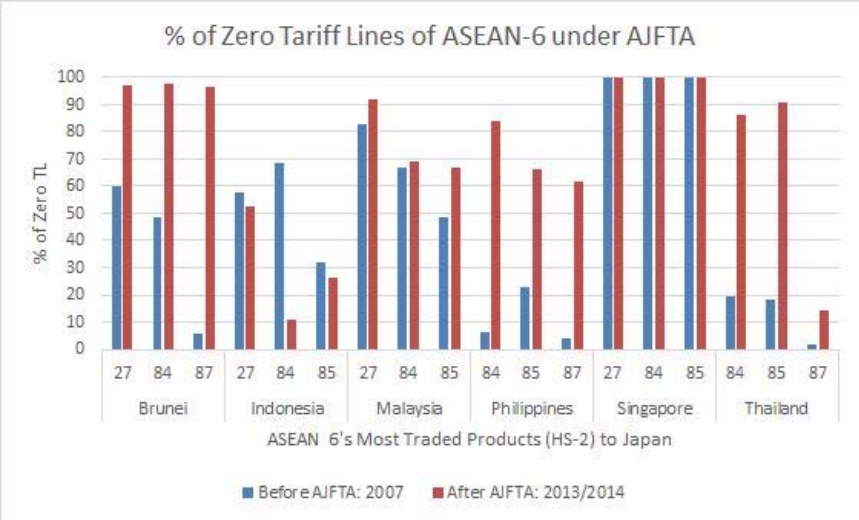
Table 3. Tariff Elimination Coverage Rates of ASEAN+3 FTAs by Kuno (2011)

Countries	ACFTA	AJFTA	AKFTA
Brunei	98.3%	97.7%	99.2%
Cambodia	89.9%	85.7%	97.1%
Indonesia	92.3%	91.2%	91.2%
Laos	97.6%	86.9%	90.0%
Malaysia	93.4%	94.1%	95.5%
Myanmar	94.5%	85.2%	92.2%
Philippines	93.0%	97.4%	99.0%
Singapore	100.0%	100.0%	100.0%
Thailand	93.5%	96.8%	95.6%
Vietnam	n.a.	94.4%	89.4%
China	94.1%		
Japan		91.9%	
Korea			90.5%
Average	**94.7%**	**92.8%**	**94.5%**

Source: Kuno (2011)

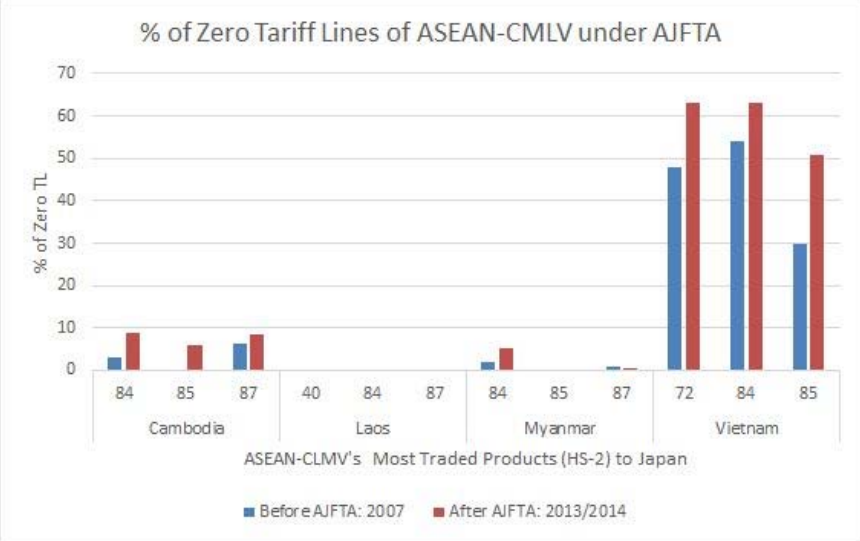
Following that conclusion, the author then decided to calculate the extent of liberalization using disaggregated data of applied percentage of zero tariff lines under the most traded products based on HS-2 goods classification. Due to data constraint, the only data available online were until 2013 or 2014. Percentage of free tariff lines for ASEAN-6 countries in 2013/2014 are noticeably higher than ASEAN-CLMV, rightfully so, because in all ASEAN+3 FTAs, tariff reduction or elimination for ASEAN-CLMV takes place at a slower pace for a longer period of time. When looking at the disaggregated data, it is apparent that the extent of liberalization for the most traded products are still not optimal and significantly lower than the aggregate liberalization rate calculated by Kuno (2011).

Graph 1. Percentage of Zero Tariff Lines of ASEAN-6 and ASEAN-CLMV under AJFTA



Source: author's calculation

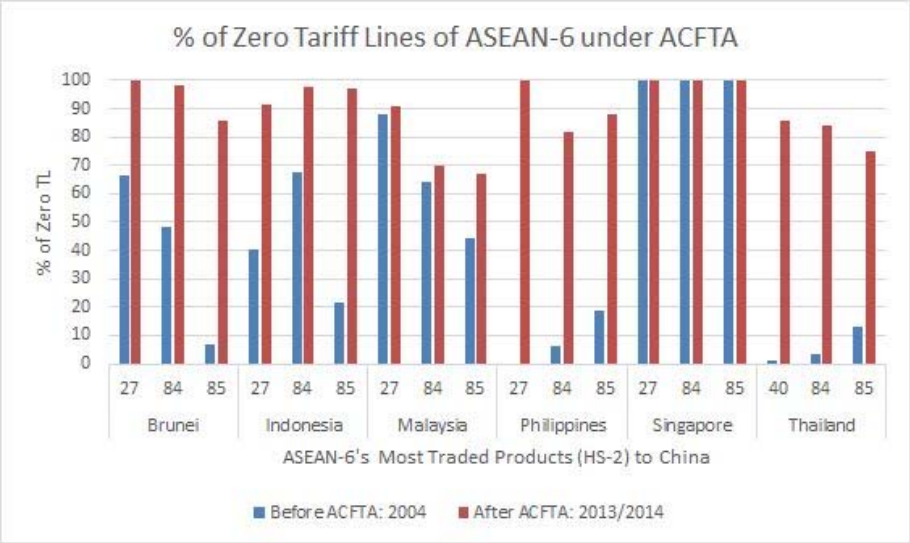
Graph 2. Percentage of Zero Tariff Lines of ASEAN-CLMV under AJFTA



Source: author's calculation. 27: Mineral fuels, mineral oils, and products of their distillation; bituminous substances; mineral waxes. 40: Rubber and articles thereof. 84: nuclear reactors, boilers, machinery and mechanical appliances; parts thereof. 85: electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles. 87: vehicles other than railway or tramway rolling stock, and parts and accessories thereof.

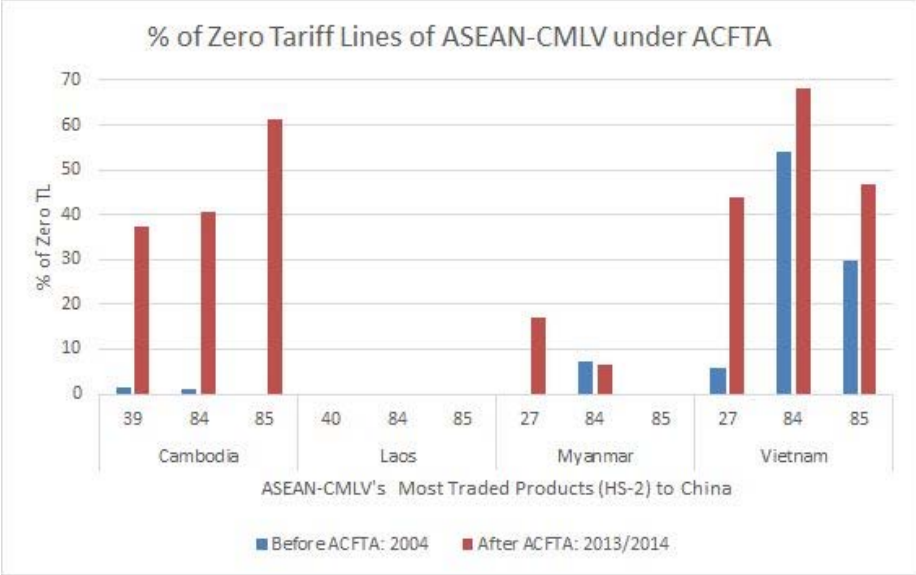
Under AJFTA, the largest liberalization occurs in Philippines and Thailand, whilst Laos remains with zero free tariff lines. On the other hand, Indonesia experienced a decrease in percentage of free tariff lines after AJFTA had been in force.

Graph 3. Percentage of Zero Lines of ASEAN-6 under ACFTA



Source: author's calculation.

Graph 4. Percentage of Zero Tariff Lines of ASEAN-CLMV under ACFTA



Source: author's calculation. 27: Mineral fuels, mineral oils, and products of their distillation; bituminous substances; mineral waxes. 39: Plastics and articles thereof. 40: Rubber and articles thereof. 84: nuclear reactors, boilers, machinery and mechanical appliances; parts thereof. 85: electrical machinery and equipment and parts thereof; sound recorders and reproducers, television image and sound recorders and reproducers, and parts and accessories of such articles. 87: vehicles other than railway or tramway rolling stock, and parts and accessories thereof.

Under ACFTA, Philippines and Thailand also experience the biggest liberalization, since their percentage of free tariff lines were significantly lower to begin with compared to the other ASEAN-6 countries. Laos also remains with zero free tariff lines from 2004 until 2014. Whilst Cambodia shows the biggest progress in liberalization under ACFTA among ASEAN-CLMV

countries. Singapore, on the other hand, had completely liberalized all of their tariff lines even before the FTAs had been signed.

Another possible explanation on the insignificant result can be traced back to the extremely complicated system of FTAs in East Asia and the low utilization of ASEAN+3 FTAs preferential treatment. Baldwin refers to the East Asian "Spaghetti Bowl" phenomena as "Noodle Bowl Syndrome" because of the extremely complicated and unorganized trade deals that arises in the region. Baldwin pointed out the unique case of how each ASEAN countries determined the market preferential access bilaterally: instead of having one trade deal for one FTA, there are 55 separate bilateral deals for each pair of country, because each country gets to chose which products falls under its own "Normal Track" and "Sensitive Track" lists depending on the trade partners. The problems are then magnified when we take into account that there are several bilateral trade deals between some East Asian countries that have taken into effect even before the establishment of ASEAN+3 FTAs. Thus, overlapping preferential tariff treatments are inevitable. As of 2019, there are 20 overlapping bilateral and multilateral trade deals in effect between ASEAN+3 (See Table 4).

Table 4. List of overlapping trade deals in ASEAN+3 countries

FTA	Date of Entry into Force	Type	Coverage
Asia Pacific Trade Agreement (APTA)	17 June 1976	PSA & EIA	G & S
Global System of Trade Preferences among Developing Countries (GSTP)	19 April 1989	PSA	G
Laos - Thailand	20 June 1991	PSA	G
ASEAN Free Trade Area	1 January 1993	FTA	G
Japan - Singapore	30 November 2002	FTA & EIA	G & S
ASEAN - China Free Trade Area	1 January 2005	FTA & EIA	G & S
ASEAN - Korea Free Trade Area	1 June 2005	FTA & EIA	G & S
Korea - Singapore	2 March 2006	FTA & EIA	G & S
Japan - Malaysia	13 July 2006	FTA & EIA	G & S
Japan - Thailand	1 November 2007	FTA & EIA	G & S
Trans-Pacific Strategic Economic Partnership (TPSEP)	28 May 2008	FTA & EIA	G & S
Japan - Indonesia	1 July 2008	FTA & EIA	G & S
Brunei - Japan	31 July 2008	FTA & EIA	G & S

ASEAN - Japan Free Trade Area	1 December 2008	FTA	G
Japan - Philippines	11 December 2008	FTA & EIA	G & S
China - Singapore	1 January 2009	FTA & EIA	G & S
Japan - Vietnam	1 October 2009	FTA & EIA	G & S
China - Korea	20 December 2015	FTA & EIA	G & S
Korea - Vietnam	20 December 2015	FTA & EIA	G & S
Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP)	30 December 2018	FTA & EIA	G & S

Note: Data extracted from World Trade Organization

The overlapping trade deals in ASEAN+3 FTAs suggests that there are a lot of preferential tariff treatments that firms can choose from, which ultimately leads to the low utilization of FTA preferential treatment problem. According to Economic Research Institute for ASEAN and East Asia's (ERIA) survey on 630 manufacturing firms across ASEAN countries, after controlling for their preferred main trading partners, there are only 25.6% of the total exporting manufacturing firms in ASEAN that claimed that they had used ACFTA preferential treatment (referred to as FORM E), 20% that claimed they used AKFTA preferential treatment (referred to as FORM AK), and only 6.6% that claimed they used AJFTA preferential treatment (referred to as FORM AJ)[9]. AJFTA has particularly very low utilization rates due to Japan having already established bilateral trade deals with many ASEAN countries, such as Malaysia, Philippines, Singapore, Thailand, Indonesia, Brunei, and Vietnam.

Moreover, to gain preferential treatment, firms have to submit forms related with the ROOs of their products. However, identifying the origins of a product requires a long and complicated process considering that the global supply chain, particularly in East Asian region, have become increasingly fragmented throughout different countries. Firms will then have to take the administrative costs into account before deciding which market access, between FTA preferential treatment or MFN treatment, that they would like to adopt. If administrative costs that are associated with applying for FTA preferential treatment are very high, they're most likely to chose MFN or other bilateral trade deals treatment that are entailed with lower cost. The low utilization rate could explain why the establishment of ASEAN+3 FTAs did not significantly

[9] Can be accessed at http://www.eria.org/ERIA-RPR-FY2013-5.pdf

affect exports in the panel data gravity estimation, because exports value itself does not change much after FTAs have taken into effect if firms does not use FTA preferential treatment in the first place.

8. Sensitivity Analysis

In order to test the robustness of the result, the author decides to test whether there are expectation effects in which the impending FTA could affect current trade flows by adding forward FTA variables to the regression. A significant result of the test would imply a reverse causality between trade values and the signing of the FTA. However, the result in table 6 shows that the future level of all FTAs do not significantly affect current trade flows.

Table 5. Expectation Effects of FTA on Current Trade Flows

Variable	(1) ACFTA	(2) AJFTA	(3) AKFTA
FTA_TC_{ijt}	0.078	0.116	0.116
	(0.104)	(0.101)	(0.094)
FTA_TC_{ijt-1}	-0.058	-0.099	0.066
	(0.130)	(0.122)	(0.129)
FTA_TC_{ijt-2}	-0.145	-0.054	-0.179*
	(0.098)	(0.085)	(0.102)
FTA_TD_{ijt}	*(omitted)*	*(omitted)*	*(omitted)*
FTA_TC_{ijt+1}	-0.114	0.030	0.126
	(0.139)	(0.121)	(0.102)
Constant	6.778	6.778	6.779
R2	0.974	0.975	0.974
No. observations	7,767	7,768	7,769

Notes: Panel regression includes bilateral fixed effects, exporter-time fixed effects, and importer-time fixed effects. Robust standard errors are used.

* $p < 0.1$

Nonetheless, the author is unable to firmly conclude that reverse causality between the two variables are indeed non-existent because the test are not sufficient to determine that.

9. Conclusion

This thesis identifies possible trade creation and trade diversion effects that arises from the signing of ACFTA, AJFTA, and AKFTA. The author used fixed effect estimation model with bilateral, exporter-time, and importer-time fixed effects to capture omitted variables that could have been correlated with trade values between two countries as per suggested by several authors prior this thesis. However, the result is only able to show that there is indeed a trade creation that arises after the signing of AKFTA due to perfect collinearity of fixed effect variables. Hence, a significant shortcoming of this thesis lies in the limited capacity of the methodology that is unable to fully capture all trade effects that arises from the establishment of trade arrangements.

This thesis also finds that overlapping trade agreements leads to low utilization of preferential treatment, and could possibly be the cause to the insignificant trade effects from ACFTA and AJFTA.

References

Anderson, J., & van Wincoop, E. (2003). Gravity with Gravitas: A Solution to the Border Puzzle. American Economic Review, 93(1), 170-192. doi: 10.1257/000282803321455214

Baier, S., & Bergstrand, J. (2007). Do free trade agreements actually increase members' international trade?. Journal Of International Economics, 71(1), 72-95. doi: 10.1016/j.jinteco.2006.02.005

Baldwin, R., & Taglioni, D. (2006). Gravity for Dummies and Dummies for Gravity Equations. doi: 10.3386/w12516

BALDWIN, R. (2008). MANAGING THE NOODLE BOWL: THE FRAGILITY OF EAST ASIAN REGIONALISM. The Singapore Economic Review, 53(03), 449-478. doi: 10.1142/s0217590808003063

Bhagwati, J., Greenaway, D., & Panagariya, A. (1998). Trading Preferentially: Theory and Policy. The Economic Journal, 108(449), 1128-1148. Retrieved from http://www.jstor.org.eur.idm.oclc.org/stable/2565672

Florian Mölders, Ulrich Volz.Trade creation and the status of FTAs: Empirical Evidence from East Asia. Review of World Economics, Springer Verlag, 2011, 147(3), pp.429-456. 10.1007/s10290-011-0095-9. hal-00682332

Indicators | ASEANStatsDataPortal. (2019). Retrieved from https://data.aseanstats.org/

Kuno, A. (2011), 'Constructing the Tariff Dataset for the ERIA FTA Database', in Lee, C. J. and M. Okabe (eds.), Comprehensive Mapping of FTAs in ASEAN and East Asia, ERIA Research Project Report 2010-26, pp.13-37. Available at: http://www.eria.org/publications/research_project_reports/images/pdf/y2010/no26/Chapter2.pdf

Lawrence H. Summers, 1991. "Regionalism and the world trading system," Proceedings - Economic Policy Symposium - Jackson Hole, Federal Reserve Bank of Kansas City, 295-301.

Magee, C. (2008). New measures of trade creation and trade diversion. Journal Of International Economics, 75(2), 349-362. doi: 10.1016/j.jinteco.2008.03.006

Romalis, J. (2005). NAFTA's and CUSFTA's Impact on International Trade. doi: 10.3386/w11059

Viner, J. (2014). The Customs Union Issue. doi: 10.1093/acprof:osobl/9780199756124.001.0001

Yang, S., & Martinez-Zarzoso, I. (2014). A panel data analysis of trade creation and trade diversion effects: The case of ASEAN–China Free Trade Area. China Economic Review, 29, 138-151. doi: 10.1016/j.chieco.2014.04.002

Sheng, Yu & Tang, Hsiao Chink & Xu, Xinpeng, 2012. "The Impact of ACFTA on People's Republic of China–ASEAN Trade: Estimates Based on an Extended Gravity Model for Component Trade," Working Papers on Regional Economic Integration 99, Asian Development Bank.

Appendix I

Table 7. List of countries

	Top 20 trading partners		
Members of ASEAN	China	Japan	Korea
Brunei	United States	China	China
Cambodia	Hong Kong SAR	Korea	United States
Indonesia	Japan	United States	Japan
Laos	Korea	Hong Kong SAR	Hong Kong
Myanmar	India	Germany	Australia
Malaysia	Australia	India	India

Philippines	Germany	United Kingdom	Germany
Singapore	Russia	Australia	United Kingdom
Thailand	Canada	France	Russia
Vietnam	United Kingdom	Italy	United Arab Emirates
	Italy	Netherlands	Canada
	Netherlands	Canada	Mexico
	Pakistan	Mexico	Italy
	United Arab Emirates	United Arab Emirates	France
	South Africa	Russia	Turkey
	Turkey	Brazil	Saudi Arabia
	Mexico	Belgium	New Zealand
	Spain	Spain	Pakistan
	France	New Zealand	Netherlands
	Bangladesh	Bangladesh	Bangladesh