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Trade Effects of ASEAN-Plus-China and -Japan Free Trade Agreements by Production Stage and Industry

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Abstract

This article examines the trade creation and diversion effects of ASEAN-Plus-China (ACFTA) and -Japan (AJFTA) free trade agreements with focuses on production stage and machinery industry by estimating the gravity trade model for the recent two decades between 1993 and 2015. The purpose for focusing on the trade flows by production stages (final goods and intermediate goods) and by industries (machinery and non-machinery) is to uncover the effects of ACFTA and AJFTA on the expanding international production networks in East Asia. The main findings are summarized as follows. First, regarding industry total, the trade creation effects of ACFTA and AJFTA are identified not in intermediate goods but in final goods. It might come from the larger tariff gaps between the Most Favored Nation (MFN) rates and the preferential rate for ASEAN in final goods than in intermediate goods, reflecting the structure of "tariff escalation". Comparing the effects of ACFTA and AJFTA, the larger trade creation effects are found in ACFTA than in AJFTA, probably due to the larger tariff gaps with the higher MFN rates in China. As for machinery industry, the trade creation effects are verified on ACFTA probably due to the large tariff gaps with the still-existing high MFN in China, while no trade creation effects are found because of no tariff gaps with almost zero MFN rates in Japan.

Keyword: ASEAN-plus-China and –Japan free trade agreement, Production stage, Machinery industry, trade creation and diversion effects

JEL Classification Codes: F13, F14, O53

1. Introduction

Since the early 2000s, regional trade agreements (RTAs) including free trade agreements (FTAs) have been in popular trends, in particular, in Asian area. As is shown in the list of all RTAs in force presented by the World Trade Organization (WTO) as of September in 2017, the total number of RTAs has reached 298. The total 298 RTAs contain the 89 RTAs covering Asian economies, and the 85 RTAs out of the 89 RTAs have been in force since the 2000s.[1] In this trends, the Association of South-East Asian Nations (ASEAN) has played a central role in forming FTAs. ASEAN itself initiated the ASEAN Free Trade Area (AFTA) in January 1993 in force, and has extended its framework by adding up plus-one economies: ASEAN-China FTA (ACFTA, effect in January 2005), ASEAN-Japan FTA (AJFTA, effect in December 2008), ASEAN-Korea FTA (AKFTA, effect in January 2010), ASEAN-Australia-New Zealand FTA (AANZFTA, effect in January 2010), and ASEAN-India (AIFTA, effect in January 2010). In addition, the comprehensive RTAs among ASEAN and the six countries above, named Regional Comprehensive Economic Partnership (RCEP), is under negotiation at present.

The rising trend in RTA formations has also encouraged a number of academic studies on RTAs from theoretical and empirical viewpoints. The theoretical issue in this context is, for instance, whether or not regional trade blocs are viable through RTA conclusion. The literature has given mixed conclusions about regionalism and globalism: Yi (2000), for example, showed the possibility of instability of a global free trade, while Oladi and Beladi (2008) argued that not regional trade blocks but a global trade bloc can be stable. Regarding the empirical studies, the focus has been to investigate economic impacts of FTAs. When it comes to the issues on FTA effects on trade flows, the central question has been about whether FTAs have "trade creation" and/or "trade diversion" effects, since Viner (1950) argued on these effects for the first time. The trade creation take places when joining a FTA leads to replacement of high-cost domestic production by imports from within the FTA members. Under this case, the trade is increased and/or created within member countries. The trade diversion, on the other hands, occurs when joining a FTA leads to replacement of cheap imports from outside the FTA members by more expensive imports from inside. Under this occasion, the trade is reduced and/or even eliminated with non-members. To examine whether both trade creation and diversion effects take place in practice and which effects are dominant in the FTA formation, a number of empirical studies have conducted the estimation of the "gravity trade model", as Section 2 describes as literature review.

[1] See WTO webpage: http://rtais.wto.org/UI/PublicAllRTAList.aspx.

Another concerns on FTA effects has emerged in recent times, in particular, in East Asia as follows. Trade integration has dramatically developed with forming international production networks since the 1990s. Kimura (2006) and Kimura et al.(2007) observed that the mechanics of international production networks in East Asia were closely linked the "vertical" division of labor in intra-industries among a number of countries characterized by different income levels, and that the mechanics were typically found in machinery industries that involved a large number of multi-layered vertical production processes. In terms of trade flows, the international production networks accompany active back-and forth international transactions of parts and components, particularly, in machinery industries. The question then arises as to how the rising trend in RTA conclusion in East Asia affects the international production networks. To be specific, the research concerns could be on whether there are any differences in the trade effects of FTAs on between production stages (final goods and intermediate goods), and on between industries (machinery and non-machinery).

This article aims to examine the trade creation and diversion effects of ACFTA and AJFTA with focuses on production stage and machinery industry by estimating the gravity trade model for the recent two decades between 1993 and 2015. The reason why this study targets on ACFTA and AJFTA, and focuses on production stages and machinery industries lies in the fact that the international production networks have involved intensive trade flows of intermediate goods as well as final goods particularly in machinery industries, and that the networks have been still expanded in the area among Japan, China and ASEAN at the timing of their FTA formations. It is the database named "RIETI-TID" that make it possible to analyze trade flows by industries and by production stages. The RIETI-TID, which is produced by the Research Institute of Economy, Trade and Industry (RIETI) in Japan, covers all trade goods and classifies them according to each production stage based on the BEC (Broad Economic Categories) classification system developed by the UN Statistics Division.

The rest of the paper is structured as follows. Section 2 reviews the literature related to the FTA effects and clarifies this study's contribution. Section 3 conducts the empirics by estimating the gravity trade model, containing methodology, estimation results and discussions. The last section summarizes and concludes.

2. Literature Review and Contribution

For assessing the trade effects of FTAs in *ex post* manner, a number of empirical studies have estimated the "gravity trade model". The model originated from Tinbergen

(1962) and Pöyhönen (1963), which were the first to apply the "Newton's Law of Gravitation" to international trade flows. In its original form, the gravity trade equation explains bilateral trade flows by the economic size of two countries and the distance between them. Since Anderson (1979) assigned the model with theoretical underpinnings for the first time, the gravity trade model has been established as being consistent with trade theories based upon models of imperfect competition and with the Heckscher-Ohlin model (see, e.g. Helpman and Krugman, 1985; and Deardorff, 1998).

The gravity trade model has often provided a useful instrument to assess the trade-integration effects of regional economic ties such as FTAs. The intensity of the trade-integration caused by FTAs is usually measured by the coefficients of dummy variables, which are added in the gravity trade equation for the FTA partners during the FTA-in-force period. A positive and statistically significant coefficient for the dummy shows that the trade flows exceed the normal level predicted by the country's economic sizes and the distance between them, thereby implying an intensive trade-integration effect caused by the FTA.

Looking at the empirical literature on the FTA effects on trade flows, even after forty years of accumulating estimations on gravity trade equations, there had seemed no clear and convincing empirical evidence, until Baier and Bergstrand (2007) presented a thorough empirical analysis on the FTA treatment effects.[2] They pointed out that trade policy is not exogenous variable, and addressed econometrically the endogeneity of FTAs: the FTA dummy variable is correlated with the error term. They argued that standard cross-section techniques using instrumental variables and control functions did not provide stable estimates of the FTA effects in the presence of endogeneity, and instead utilized a theoretically-motivated gravity equation using panel data with bilateral fixed effects. They finally found that, on average, an FTA approximately doubles two members' bilateral trade after ten years, i.e., seven times the effect estimated using the standard cross-section techniques.

Based on the econometrical methodologies of Baier and Bergstrand (2007), Urata and Okabe (2014) examined the impacts of RTAs including FTAs on trade flows, with a particular focus on their trade creation and diversion effects. They estimated the gravity trade equation covering 67 countries/regions for 27 years from 1980 to 2006 at a disaggregated level of 20 products. Their estimation addressed the problem of the RTA-endogeneity bias and zero trade flows by applying the panel-data analysis with bilateral fixed effects and the Poison pseudo-maximum likelihood model as its estimating

[2] Baier and Bergstrand (2007) expressed the past unreliable estimates of FTA treatment effects as "fragile" estimates by citing Frankel (1997) and Ghosh and Yamarik (2004).

technique. Their main findings were as follows: plurilateral RTAs produce trade creation for many more products compared with bilateral RTAs; RTAs among developed countries generate trade creation for a half of all products but not trade diversion for most of products, whereas RTAs among developing countries give rise to trade diversion for many more products – probably due to high tariffs imposed on imports from non-members by developing countries.

When we focus on the literature on empirical studies of individual trade effects of ASEAN-plus-one FTAs, most of studies have applied ordinary gravity trade equations but not addressed the problem of the FTA-endogeneity bias through the panel-data estimation with bilateral fixed effect. The followings are the examples of the studies using ordinary gravity trade equations. Sheng et al. (2012) examined the impact of ACFTA on the members' trade flows and found that ACFTA leads to substantially higher bilateral trade between ASEAN and China. Yang and Martinez-Zarzoso (2014) also investigated the trade effects of ACFTA focusing on agricultural and manufactured products and showed the trade creation effect not only within ASEAN but also between ASEAN and China. The more comprehensive study of the trade effect of ASEAN-plus-one FTAs was done by Okabe (2015). It found that the trade creation effects of ACFTA and AKFTA appeared in industrial suppliers and capital goods between members whereas the trade impact of AJFTA was not revealed in many cases, and suggested that the newer regional FTA such as RCEP needed to have a higher level of liberalization including not only tariff elimination but also such other measures as non-tariff elimination, coordination of rules of origin and improvement of FTA usability.

It was Taguchi (2015) that estimated gravity trade model by applying the panel-data with bilateral fixed effects to clear the FTA-endogeneity problem, for examining the trade creation and diversion effects of ASEAN-plus-one FTAs for the recent two decades between 1993 and 2013. It showed that the trade creation effect in ACFTA was much larger than those in AKFTA and AJFTA, and that the trade diversion effects were commonly negative in ACFTA, AKFTA and AJFTA. It also speculated that the larger trade creation effect in ACFTA might come from the wider gap between the general tariff rate and the preferential tariff rate for ASEAN in China.

This study extends the study of Taguchi (2015) by decomposing the total-industry's trade effects of the FTAs into their trade effects by production stage and by industries. The contributions of this study to the literature above are summarized as follows. First, this study applies the panel-data with bilateral fixed effects to the estimation of gravity trade model for the purpose of clearing the FTA-endogeneity problem, as in Baier and Bergstrand (2007), Urata and Okabe (2014) and Taguchi (2015). Second, this study deals

with the trade flows by production stages (final goods and intermediate goods) and by industries (machinery and non-machinery), for uncovering the effects of AJFTA and ACFTA on the expanding international production networks in East Asia. Third, this study discusses the estimated trade effects of AJFTA and ACFTA by each category in connection with the gap between the general tariff rate and the preferential tariff rate for ASEAN in Japan and China

3. **Empirics**

This section turns to the empirical analysis of the trade creation and diversion effects of ACFTA and AJFTA through estimating the gravity trade model. We first observe the trade flows of member countries, clarify the methodology of the gravity trade model, represent the estimation outcomes and discuss them.

3.1 Observation of Trade Flows

This subsection simply observes the trade flows between ASEAN4 (Indonesia, Malaysia, Philippines and Thailand) and China, and those between ASEAN4 and Japan for 1993-2015. All the trade data are retrieved from RIETI-TID[3]. Figure 1 displays the trades of industry total (stage total, final goods and intermediate goods) and machinery (final goods and intermediate goods)[4]. The main findings are as follows. First, the increasing trends are steeper in the two-way trades between ASEAN4 and China than those between ASEAN4 and Japan in all the categories, and so the trade volumes between ASEAN4 and China overtook those between ASEAN4 and Japan during 1993-2015. Second, looking at the trade flows by production stages, in those between ASEAN4 and China in recent years, final goods are dominant in the exports from China to ASEAN4, while intermediate goods are dominant in the exports from ASEAN4 to China in industry total and machinery. This relationship might reflect the structure that China import parts and components from ASEAN4 and export final goods to ASEAN4 by processing them. Third, in the trade flows between ASEAN4 and Japan, final goods as well as intermediate goods are still dominant in the exports from Japan to ASEAN4 over the exports from ASEAN4 to Japan in machinery industries.

When we look at the trade share of machinery relative to industry total in 2015, it accounts for 69% and 50% in final goods and intermediate goods in the total trade

[3] The latest version is "RIETI-TID 2015". See the website: http://www.rieti-tid.com/trade.php.

[4] The "machinery" is the sum of general machinery, electronical machinery, household electric appliances, transportation equipment and precision machinery.

between ASEAN4 and China, and 63% and 39% in final goods and intermediate goods in the total trade between ASEAN4 and Japan, respectively. These large trade shares of machinery might reflect the fact that the expansion of international production networks have involved intensive trade flows of intermediate goods as well as final goods in machinery industries, and justify the division of industry total into machinery and non-machinery industries in the subsequent estimation of gravity trade model.

From the simple observation above, however, we cannot judge whether ACFTA and AJFTA have accelerated the trade flows, since the trade flows would also be affected by the other economic variables. The relationships between FTAs and trade flows should, therefore, be statistically tested by a more sophisticated manner, i.e., by the estimation of gravity trade model.

3.2 Methodology of Gravity Trade Model Estimation

This subsection clarifies the methodology of the estimation of gravity trade model to investigate the trade creation and diversion effects of AJFTA and ACFTA. We follow the methodology presented by Baier and Bergstrand (2007), Urata and Okabe (2014) and Taguchi (2015), and specifically adopt a theoretically-motivated gravity trade model using panel data with bilateral fixed effects and multilateral time-varying price resistance terms. The equation for estimation is specified as follows.

$$\ln\left[X_{ijt}/\left(GDP_{it}GDP_{jt}\right)\right] = \alpha_0 + \alpha_1 FTAC_{ijt} + \alpha_2 FTAD_{ijt} + \alpha_3 D_{ij} + \alpha_4 rex_{ijt} + \varepsilon_{ijt} \quad (1)$$

where X_{ijt} is the value of the trade flows from exporter i to importer j, which is decomposed into those of industry total (stage total, final goods and intermediate goods) and machinery (final goods and intermediate goods) in this study; $GDP_{it}(GDP_{jt})$ is the level of nominal gross domestic product in country i (j); D_{ij} is a bilateral dummy variable between i and j; rex_{ijt} is a bilateral real exchange rate in the logarithm; and ε_{ijt} is an error term. We also insert the time dummy from 1993 to 2015.

Regarding the FTA effects on trade flows, the equation includes two kinds of dummy variables as in Urata and Okabe (2014). $FTAC_{ijt}$, a variable for denoting trade creation effect, takes a value 1 if both importer and exporter belong to the same FTA and 0 otherwise, and $FTAD_{ijt}$, a variable for denoting trade diversion effect, takes a value 1 if the importer is a member of the FTA, but the exporter is not and 0 otherwise, respectively. From the concept of trade creation and diversion effects we described in the introduction, the sign of the coefficient, α_1, is expected to be positive while α_2 is expected to be negative. The main targets in this study are the trade effects of ACFTA and AJFTA in

connection with the international production networks in East Asia. ACFTA has been in force since January 2005 and thus its dummy takes value 1 from 2005, and AJFTA has been in force since December 2008 and its dummy value takes 1 from 2009. In addition, the dummy for AKFTA, AANEFTA and AIFTA (hereafter AOFTA) is also inserted from 2010 since their FTAs has come into force since January 2010.

To address the FTA-endogeneity bias, the equation includes a bilateral dummy variable between i and j, D_{ij}. Baier and Bergstrand (2007) argued that the FTA is not exogenous variable but is influenced by considerable unobserved time-invariant heterogeneity among country pairs such as policy-related barriers (that also affects trade volume), and that this omitted variable bias is the major source of endogeneity facing estimation of FTA effects in gravity equations using cross-section data. They examined the validity of cross-section techniques using instrumental variables and control functions, but concluded that these techniques were not reliable enough to provide stable estimates of the FTA effects, and that the unobserved time-invariant bilateral variables were best controlled by using bilateral "fixed effects" in the gravity equation using panel data.[5] There would be another potential endogeneity bias created by simultaneity: GDP is a function of net exports. Although the simultaneity bias is considered to be not so large in the literature, the specification (1) has GDPs on the left hand side.[6]

The specification (1) includes a bilateral real exchange rate, rex_{ijt}, to account for the theoretically-motivated multilateral time-varying price resistance terms. The gravity trade model suggested by recent formal theoretical developments requires the multilateral price variables. Anderson and van Wincoop (2003) suggested the use of country-specific fixed effects as the method for accounting for multilateral price terms in cross section. In a panel setting, however, the multilateral price terms would be time-varying. One way to control for price changes is to introduce, similarly to Rose (2000) and Vandenbussche and Zanardi (2010), the bilateral real exchange rate that varies over time and tracks price changes, the coefficient of which is expected to have a negative sign.

Some of the studies on gravity trade model encounter the treatment of zero trade flow values, as Urata and Okabe (2014) applied the Poison pseudo-maximum likelihood model to cope with it. This study, however, deals with aggregated values of trade flows of selected large countries, which do not include zero values.

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[5] Baier and Bergstrand (2007) conducted the estimation using first-differenced data as well as fixed effects for robustness analysis, and found no significant differences in the estimation outcomes. Thus we herein only focus on the fixed-effect estimation.

[6] Scaling the left-hand-side trade flow by product of GDPs means imposing the restriction of unitary income elasticities. Baier and Bergstrand (2007), however, showed that imposing the unitary income elasticities had no impact on the FTA coefficient estimate.

3.3 Data for Gravity Trade Model Estimation

The sample period is from 1993 to 2015. The reason why we choose 1993 as its starting year is that the FTA within ASEAN named AFTA was in force in January 1993, and so after this we can concentrate only on the effects of ASEAN-plus-one FTAs.

The sample covers 14 countries/regions: Australia, China, E.U. (28 countries), India, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines, Taiwan, Thailand, U.S., and the rest of the world (RW). Regarding ASEAN, we focus on Indonesia, Malaysia, Philippines and Thailand (ASEAN4), since the latecomers such as Cambodia, Lao PDR, Myanmar and Vietnam have their different schedules of tariff reduction in AFTA.[7] Table 1 summarizes the trade flows in the sample countries/regions in 2015. It shows that the exports of China, Japan and ASEAN4 to the sample countries/regions except RW account for more than sixty percent of their exports to the world.

We then construct panel data for the period between 1993 and 2015 with the trade combinations of 14 countries/regions for the gravity trade model estimation. The trade data come from RIETI-TID 2015 as stated before. The GDP and the data for calculating a bilateral real exchange rate, i.e. consumer prices and bilateral nominal exchange rates, are from World Economic Outlook (WEO) Database (April 2017) and International Financial statistics, by the International Monetary Fund.[8]

3.4 Estimation Outcomes and Discussion

Table 3 reports the estimation outcomes of the gravity trade model on the trade creation and diversion effects of ASEAN-plus-one FTAs. We herein focus on the trade effects of ACFTA and AJFTA in the context of the international production networks. The other FTA effects are difficult to interpret, since the effects of three FTAs, AKFTA, AANEFTA and AIFTA, are combined in one dummy's coefficient.

We first concentrate on the results of trade creation effects. Regarding the category of industry total, the trade creation effects of both ACFTA and AJFTA are significantly positive on trade flows as expected in final goods but not in intermediate goods and stage total. When we compare the volume of the effects, the effect of ACFTA is about three times larger than that of AJFTA. The large trade creation effects of ACFTA are consistent with the previous studies of Sheng et al. (2012), Yang and Martinez-Zarzoso (2014), Okabe (2015) and Taguchi (2015). As for machinery industry, the trade creation effects are significantly positive in ACFTA in both final and intermediate goods, but not (even

[7] We also exclude Singapore Brunei due to transit-trading and oil producing country, respectively.
[8] See the website: http://www.imf.org/en/data.

negative) in AJFTA. On the contrary, for non-machinery industry, the trade creation effects are significantly positive in AJFTA but negative in ACFTA.

Looking at the trade diversion effects, the outcomes are not always significant and even have an opposite (positive) sign. It might be because the imports from outside the FTA members are affected by the trade creation effects in such a way that the trade creation, for instance, induces the additional demands for related capital goods and intermediate goods. As for the price resistance terms, the coefficients of the bilateral exchange rate are significantly negative as expected in all the cases except the case of final goods in non-machinery industry.

We discuss the estimation outcomes above from the perspective of tariff rates. In general, trade follows are affected by tariff elimination and reduction by FTAs in force. The general tariff rate as a benchmark rate is represented by the "Most Favored Nation (MFN) tariff rate". Thus the gap between the MFN tariff rate and the preferential tariff rate under FTAs could be one of the key elements to give an influence to trade flows. The data of the MFN tariff rate and the preferential tariff rate under FTAs are provided by World Integrated Trade Solutions (WITS),[9]

In the case of ACFTA and AJFTA, the comparison of tariff gaps should be made in the side of China and Japan, since the tariffs in ASEAN side seem to be common for China and Japan. Table 3 describes the MFN tariff rates, the preferential tariff rates for ASEAN under ACFTA and AJFTA and their gaps in China and Japan in 2011, by industry total and machinery industry and by final goods and intermediate goods, based on WITS data. When we focus on industry total, we found that the tariff gaps are larger in final good than in intermediate goods both in China and Japan. This mainly comes from the fact that the MFN tariff rates are larger in final goods than in intermediate goods, which is known as "tariff escalation" in general.[10] In the comparison of the tariff gaps between China and Japan, the gaps are much larger in China than in Japan, since the MFN tariff rates are much higher in China than in Japan. When we turn to machinery industry, the tariff gaps are large in China both in final goods and intermediate goods, since the MFN rates are still high in China in both categories. On the other hand, in Japan there seem to be no tariff gaps because the MFN rates themselves are extremely low already in machinery industry.[11]

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[9] See the website: https://wits.worldbank.org/WITS/WITS/Restricted/Login.aspx.

[10] The tariff escalation is explained by the glossary term by WTO as follows: "Higher import duties on semi-processed products than on raw materials, and higher still on finished products. This practice protects domestic processing industries and discourages the development of processing activity in the countries where raw materials originate."
See the website: https://www.wto.org/english/thewto_e/glossary_e/tariff_escalation_e.htm.

[11] In Japan, since the MFN rates themselves are extremely low already in machinery industry, there

The estimation outcomes on the trade creation effects of ACFTA and AJFTA are almost consistent with the structure of the tariff gaps above. First, regarding the category of industry total, the trade creation effects of ACFTA and AJFTA identified not in intermediate goods but in final goods might come from the larger tariff gaps between the MFN rates and the preferential rate for ASEAN in final good than in intermediate goods, reflecting the structure of "tariff escalation". At the same time, the larger trade creation effects of ACFTA than of AJFTA might generate from the larger tariff gaps in China than in Japan due to the higher MFN rates in China. As for machinery industry, the trade creation effects are verified on ACFTA probably due to the large tariff gaps with the still-existing high MFN rates regardless of production stage in China. On the other hand, no trade creation effects are found because of no tariff gaps with almost zero MFN rates in Japan. Concerning non-machinery industry, the trade creation effects identified on AJFTA might be explained by the still-existing high MFN rates in such sectors as agricultural products in Japan. This category should, however, be investigated further by individual industries in connection with tariff rates

4. Concluding Remarks

This article examined the trade creation and diversion effects of ACFTA and AJFTA with focuses on production stage and machinery industry by estimating the gravity trade model for the recent two decades between 1993 and 2015. The purpose for focusing on the trade flows by production stages (final goods and intermediate goods) and by industries (machinery and non-machinery) was to uncover the effects of ACFTA and AJFTA on the expanding international production networks in East Asia.

The main findings are summarized as follows. First, regarding industry total, the trade creation effects of ACFTA and AJFTA are identified not in intermediate goods but in final goods. It might come from the larger tariff gaps between the MFN rates and the preferential rate for ASEAN in final goods than in intermediate goods, reflecting the structure of "tariff escalation". Comparing the effects of ACFTA and AJFTA, the larger trade creation effects are found in ACFTA than in AJFTA, probably due to the larger tariff gaps with the higher MFN rates in China. As for machinery industry, the trade creation effects are verified on ACFTA probably due to the large tariff gaps with the still-existing high MFN in China, while no trade creation effects are found because of no tariff gaps with almost zero MFN rates in Japan.

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are quite limited items as targets for AJFTA.

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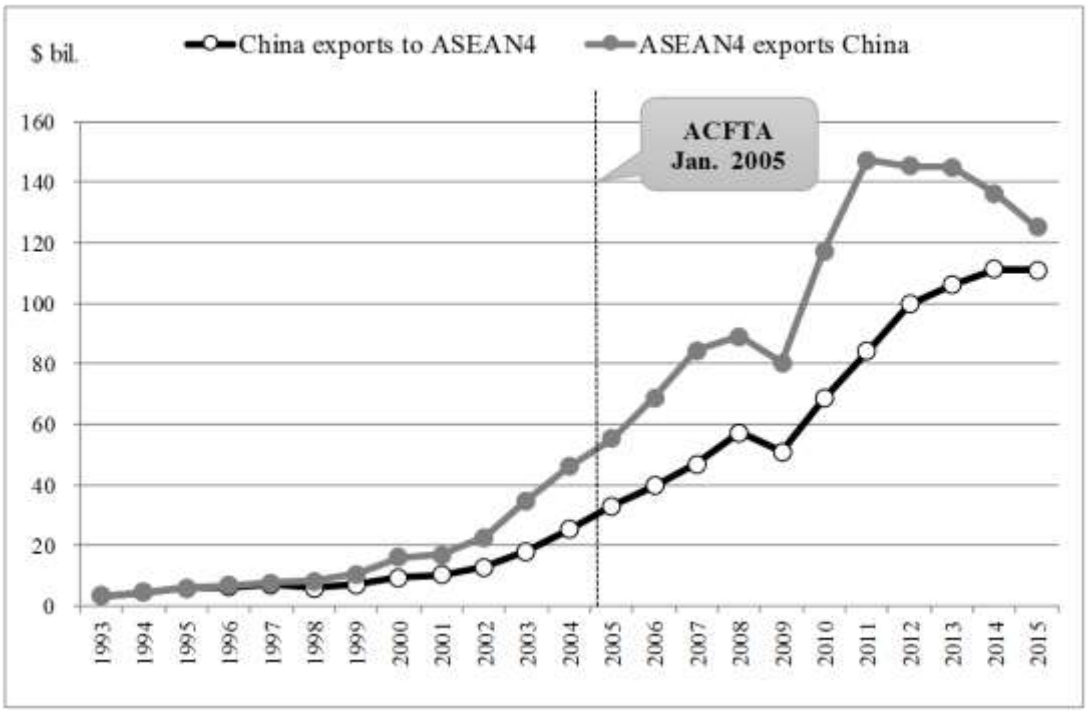
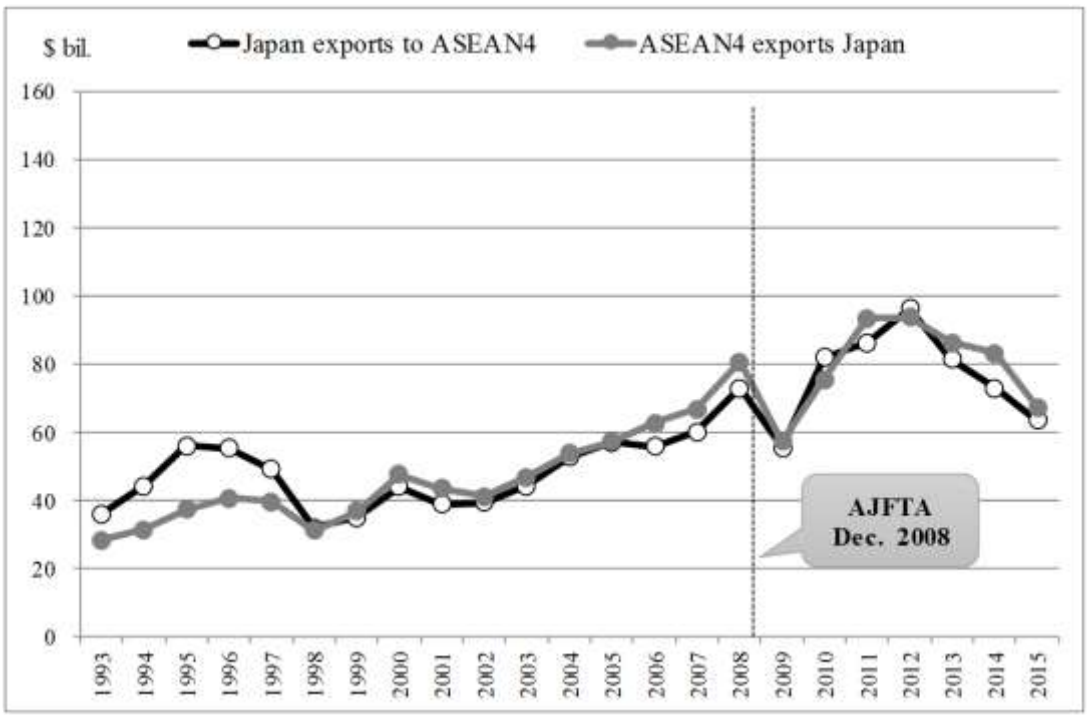
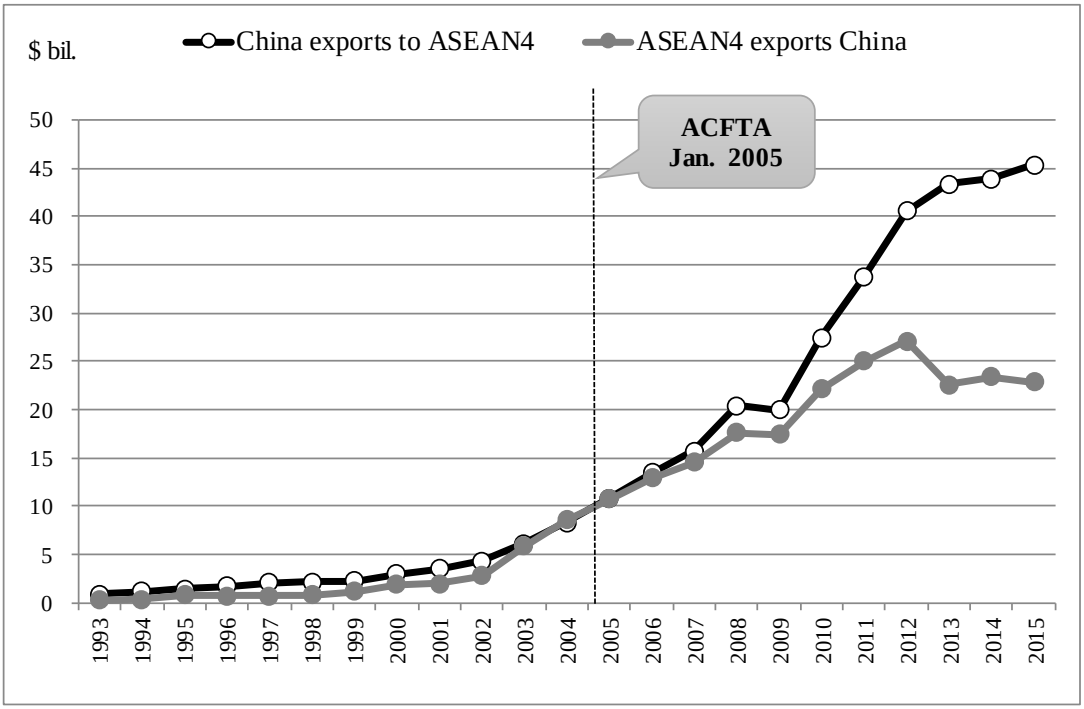
Figure 1 Trends in Trade Flows

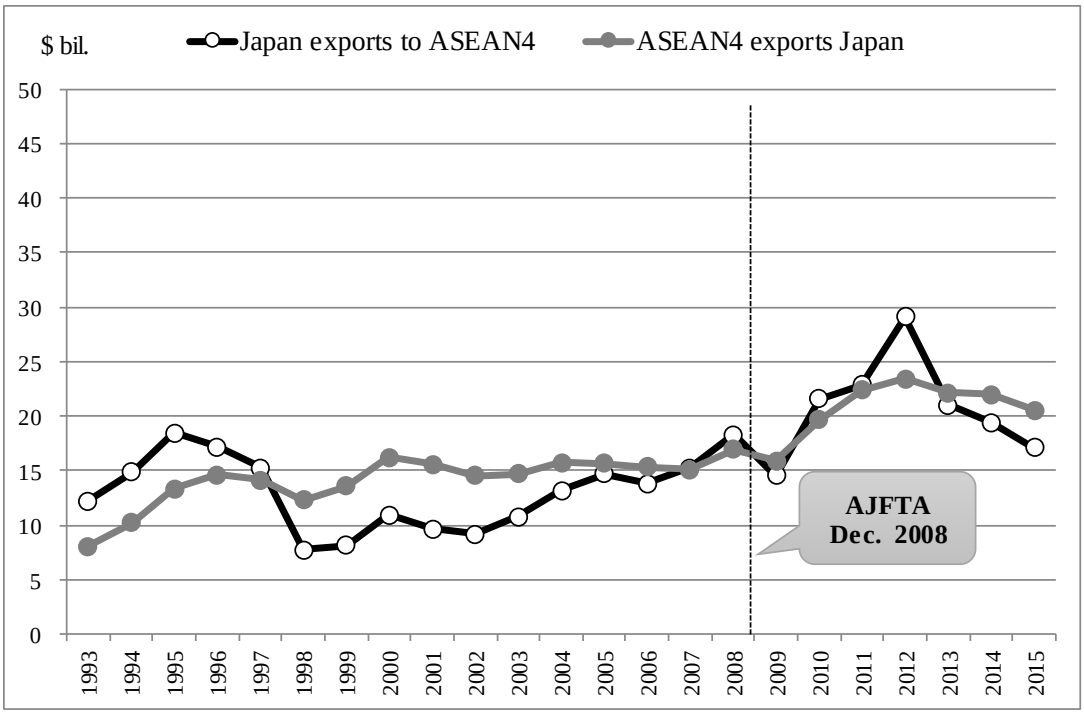
[Industry Total, Stage Total]



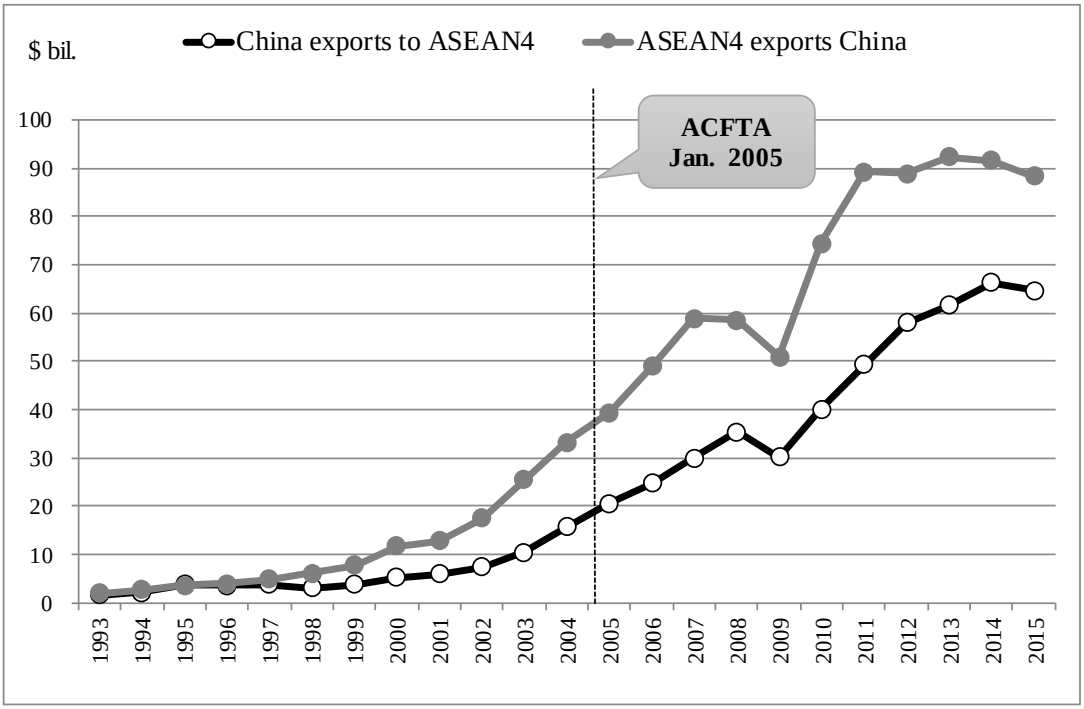


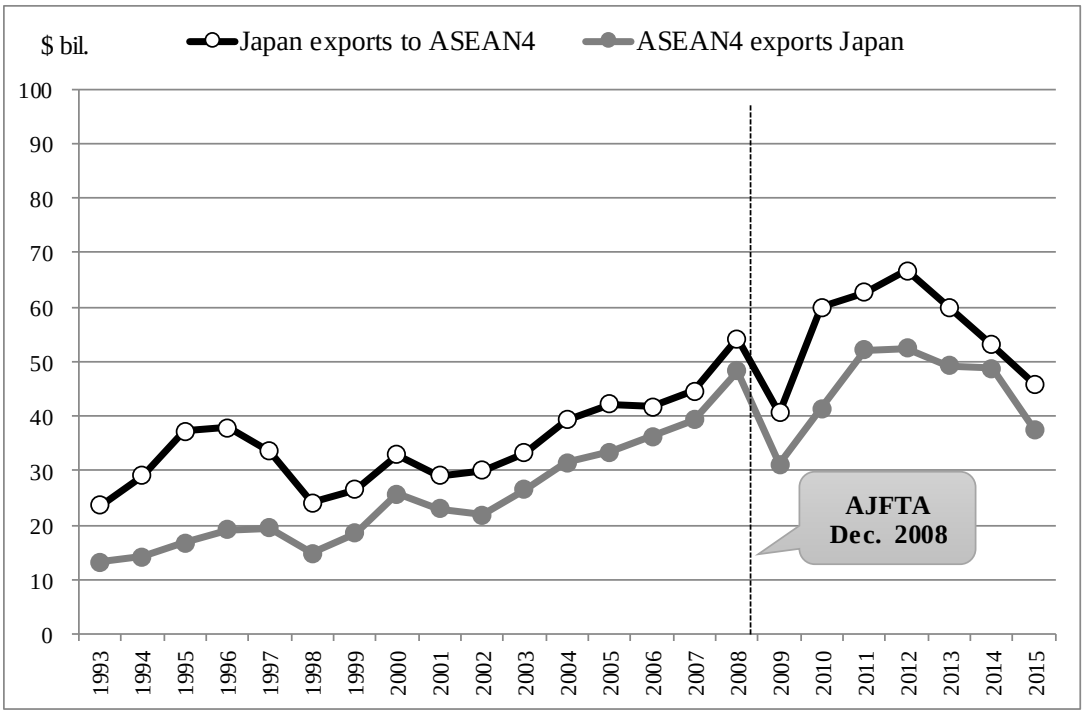
[Industry Total, Final Goods]



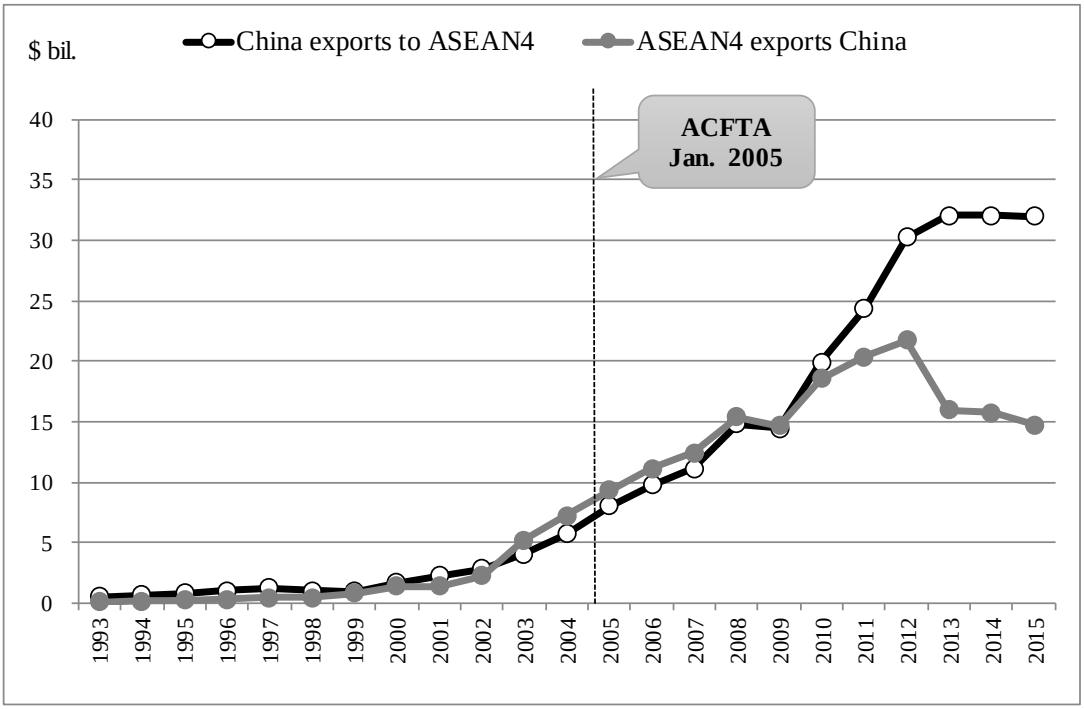


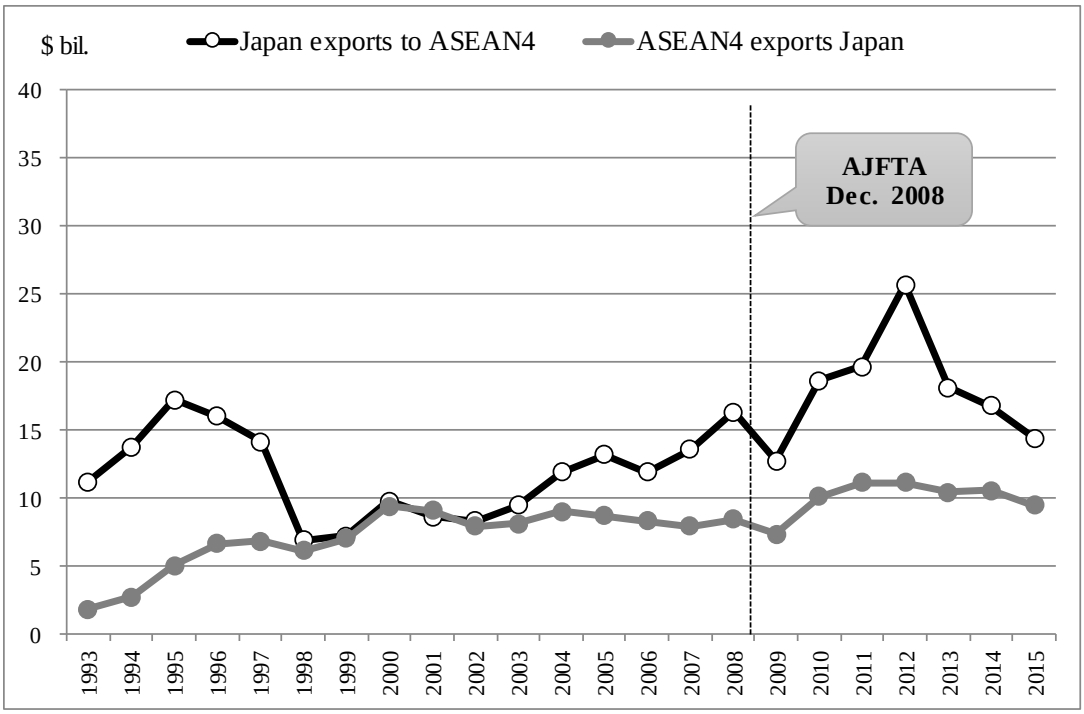
[Industry Total, Intermediate Goods]



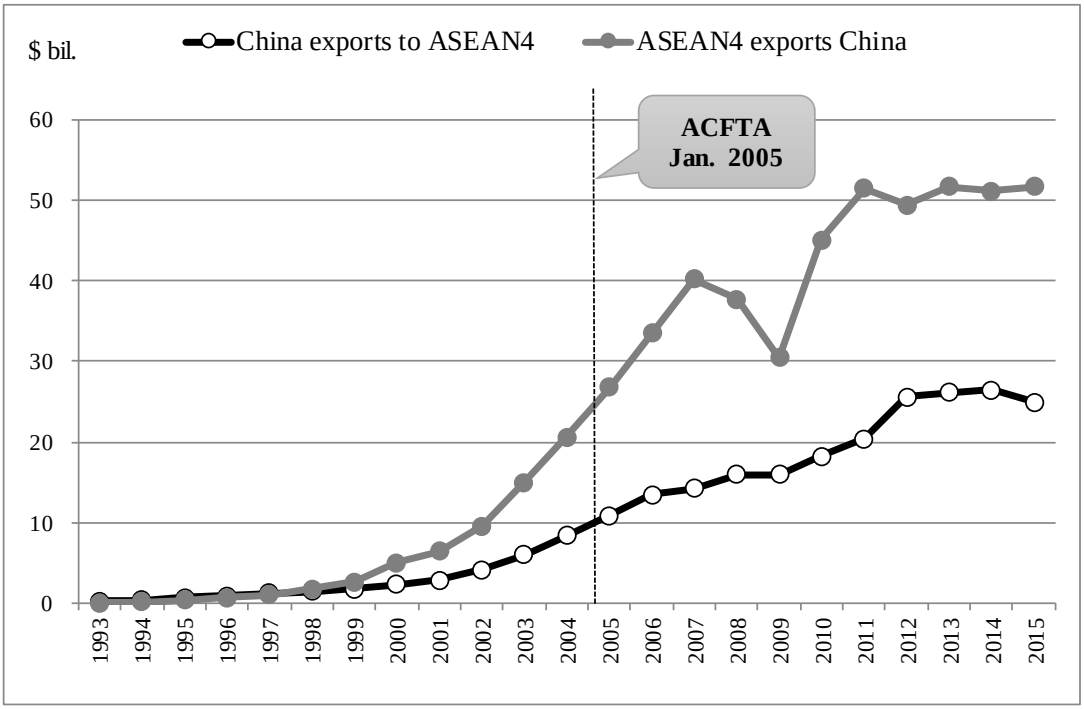


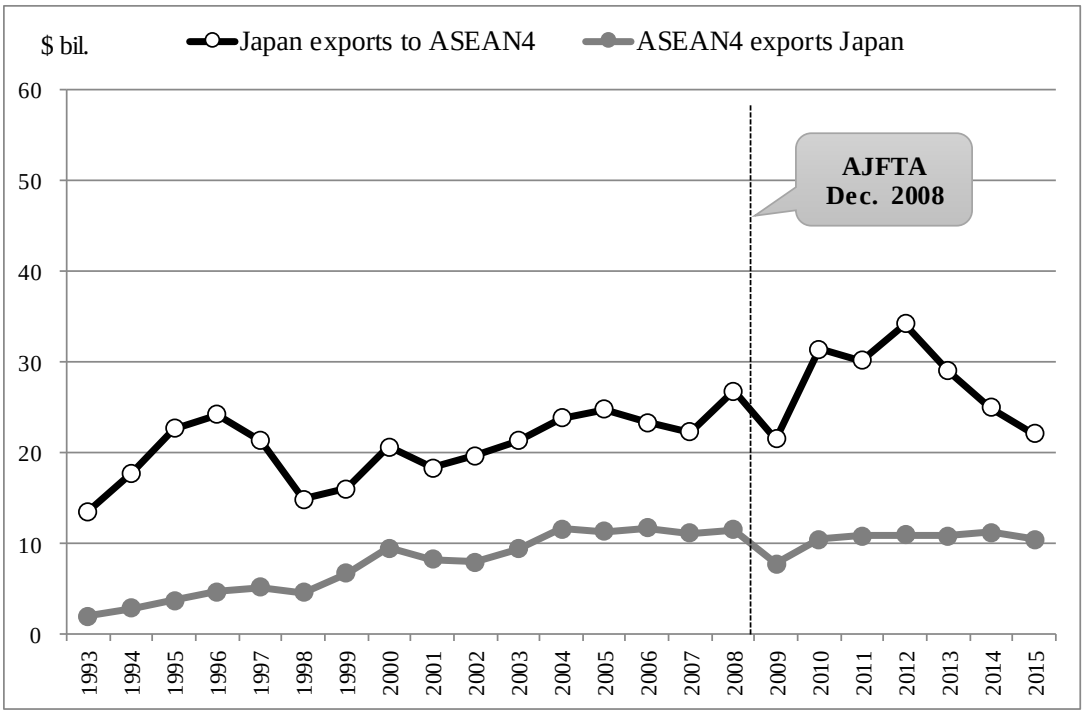
[Machinery, Final Goods]





[Machinery, Intermediate Goods]





Source: RIETI-TID2015

Table 1 Summary of Trade Flows in Sample Countries/Regions in 2015

Billion U.S. dollars

Exporter / Importer	China	Japan	ASEAN 4
China		137.1	125.2
Korea	83.5	45.2	24.8
Japan	149.7		67.3
ASEAN 4	111.1	63.5	
Taiwan	41.7	37.2	14.5
U.S.	455.3	126.4	84.1
EU(28)	379.7	75.0	71.5
Australia	42.8	14.2	21.3
New Zealand	6.7	2.3	3.3
India	55.3	9.1	29.1
World	2,062.5	672.1	700.8

% of exports to the world

Exporter / Importer	China	Japan	ASEAN 4
China		20.4	17.9
Korea	4.0	6.7	3.5
Japan	7.3		9.6
ASEAN 4	5.4	9.4	
Taiwan	2.0	5.5	2.1
U.S.	22.1	18.8	12.0
EU(28)	18.4	11.2	10.2
Australia	2.1	2.1	3.0
New Zealand	0.3	0.3	0.5
India	2.7	1.4	4.2
Total /World	64.3	75.9	63.0

Source: RIETI-TID2015

Table 2 Estimation Outcomes on Trade Effects of ASEAN-Plus-One FTAs

[Industry Total]

Industry Total	Stage Tatoal	Final Goods	Intermediate Goods
	exit	*exif*	*exii*
ACFTA: Trade Creation	0.159 (1.427)	0.381*** (2.61)	0.155 (1.13)
ACFTA: Trade Diversion	-0.051** (-2.05)	-0.362*** (-9.82)	0.122*** (2.84)
AJFTA: Trade Creation	0.064 (1.33)	0.135*** (2.73)	0.063 (1.09)
AJFTA: Trade Diversion	-0.013 (-0.39)	0.157*** (4.57)	0.034 (0.74)
AOFTA: Trade Creation	-0.081*** (-2.84)	0.083** (2.49)	-0.189*** (-6.35)
AOFTA: Trade Diversion	-0.076*** (-3.51)	0.075*** (2.97)	-0.024 (-1.21)
REX	-0.177*** (-5.90)	-0.470*** (-14.55)	-0.269*** (-22.23)
Constant	9.673*** (69.93)	9.786*** (60.86)	9.348*** (171.0)
Adjusted RR	0.844	0.721	0.849
Observation	4,140	4,140	4,140

[Machinery Industry]

Machinery Total	Final Goods	Intermediate Goods
	exmf	*exmi*
ACFTA: Trade Creation	0.629*** (3.29)	0.848*** (3.11)
ACFTA: Trade Diversion	-0.359*** (-4.59)	0.127** (2.09)
AJFTA: Trade Creation	-0.023 (-0.39)	-0.125** (-2.01)
AJFTA: Trade Diversion	-0.176** (-2.44)	-0.253*** (-3.91)
AOFTA: Trade Creation	0.295*** (6.83)	0.160*** (4.86)
AOFTA: Trade Diversion	0.601*** (13.85)	0.387*** (11.67)
REX	-1.146*** (-15.29)	-0.877*** (-14.65)
Constant	11.944*** (35.34)	10.749*** (39.04)
Adjusted RR	0.691	0.797
Observation	4,140	4,140

[Non-Machinery Industry]

Non-Machinery Total	Final Goods	Intermediate Goods
	exnf	*exni*
ACFTA: Trade Creation	-0.251*** (-2.62)	-0.280*** (-3.00)
ACFTA: Trade Diversion	-0.820*** (-12.49)	0.103** (2.27)
AJFTA: Trade Creation	0.592*** (8.24)	0.254*** (3.92)
AJFTA: Trade Diversion	0.681*** (11.32)	0.184*** (3.33)
AOFTA: Trade Creation	-0.086*** (-2.62)	-0.289*** (-7.38)
AOFTA: Trade Diversion	-0.251*** (-8.35)	-0.040* (-1.96)
REX	0.159* (1.83)	-0.092*** (-3.27)
Constant	6.122*** (14.71)	8.073*** (65.50)
Adjusted RR	0.624	0.825
Observation	4,140	4,140

Notes: *t*-statistics are in parentheses. *, **, ***, denotes statistical significance at 10, 5, and 1 percent level.
Source: RIETI-TID2015, WEO database(April 2017) and International Financial Statistics.

Table 3 Gap between MFN Rate and Preferential Rate under ACFTA and AJFTA

% in 2011	MFN Tariff Rate (a)	Preferential Tariff Rate for ASEAN (b)	Gap (a)-(b)
China: Industry Total			
Final Goods	11.79	0.20	11.59
Intermediate Goods	7.69	0.08	7.61
China: Machinery Total			
Final Goods	8.77	0.20	8.57
Intermediate Goods	8.74	0.23	8.51
Japan: Industry Total			
Final Goods	7.13	2.85	4.28
Intermediate Goods	2.83	0.26	2.57
Japan: Machinery Total			
Final Goods	0.08	-	
Intermediate Goods	0.06	-	

Source: World Integrated Trade Solutions (WITS).
See the website: https://wits.worldbank.org/WITS/WITS/Restricted/Login.aspx.