THE EFFECT OF REGIONAL TRADE AGREEMENTS ON ASEAN TRADE FLOWS

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Abstract

Purpose
This paper study the impact of 5 ASEAN RTAs simultaneously to get comprehensive results.

Design/methodology/approach
The Hausman-Taylor estimator was used to overcome endogeneity problems in the gravity equation without dropping the time-invariant variables which become the advantage of this method.

Findings
The results show that AFTA increases trade flows between members and promotes imports and exports to the rest of the world. ASEAN regional integration outside the region with six trade partners show positive effect to members and has a minimal negative effect to non-members globally.

Research implications
Increase cooperation in trade sector and deeply connect the labor force, investment, and financial sectors in the region.

Originality/value
Previous research examined each RTA individually or only included 6 initial ASEAN members. While this study estimates the effects of six ASEAN RTAs for 30 years excluded Hong Kong RTA signed in 2019

Keywords:
ASEAN, RTA, Trade Flows.

INTRODUCTION

International agreement in trade has been growing rapidly over the past few decades. A trade agreement can be formed in Preferential Trade Areas (PTA), Free Trade Areas (FTA), Customs Unions (CU), Common Markets, Economic Unions, and full economic integration. The most common form of trade agreement made is the FTA and CU according to Balassa (1961). Countries that are a member of the FTA eliminate trade barriers by reducing tariffs during scheduled periods for products and services that originated from other members. Generally, countries that share the same geographical area trade more than those countries that have greater distant. Nevertheless, with the appeal of market share and the advantage of air freight and sea cargo developments, more agreements are made across regions. According to the World Trade Organization (2021), the cumulative RTAs in force in 1990 was 22 agreements, and it rose to 214 and 308 agreements in 2010 and 2020, respectively.

There has been a debate about the effects of regional trade agreements that started with the increase of RTAs. This raised concerns from the experts that pointed out the possibility of RTAs harming multilateral trade in a sense that it could shift member from global trade. In other word, the aimed to eliminate trade discrimination and promoting equal treatment for all countries proposed by WTO will be diminishing. Despite issue raised, many countries consider regional cooperation as a powerful tool to reduce tariff.

In line with the trade agreements, total trade in the world showed a significant increase as shown in picture 1 which reflects positive correlation between trade value and trade agreements.
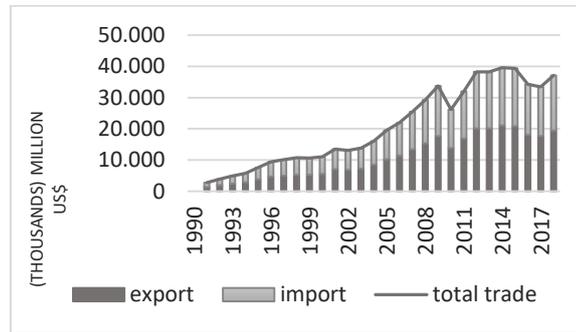
Picture 1. Total trade value in the world

Source: WITS - World Bank, 2020.

According to World Integrated Trade Solution of World Bank (2020) data, the world's total trade value in 1990 was 2.726 billion US$ with 204 partners and 5000 products. The total trade value in 2000 increased about 395 percent to 13.498 billion US$ in 2000 with 236 partner countrie, and this increasing trend followed for several years until recently although it is not as large as before.

Economic collaborations in Southeast Asia came into realization when the ASEAN Free Trade Agreement (AFTA) was signed in 1992. This reduced intra-regional tariffs of goods and significantly increased the trade flows to the ASEAN members. There are 5 RTAs made under the ASEAN framework, which enhancing cooperation with 6 countries outside the Southeast Asia region. The ASEAN-China trade agreement which signed in 2005 is the first RTA made with country outside the region. It followed with the ASEAN-Japan agreement in 2008 and four trade agreements made with Korea, Australia, New Zealand, and India in 2010. The empirical study of RTAs on trade flow is rich. However, only few studies have examined the total effect of six ASEAN RTAs for the 10 ASEAN members in 30 years. Previous research examined each RTA individually or only included 6 initial ASEAN members.

The primary research objective is to examine the effect of AFTA on ASEAN trade flow between members during the time period of 1990-2019. Another purpose of the study is to analyze the effects of RTAs that made with countries outside the region: China, Japan, Korea, Australia, New Zealand, and India, including its effects on trade creation and trade diversion with the non-members.

LITERATURE REVIEW

Trade theory shows that nations can gain through trade when they open their border and eliminate trade barriers. According to Huber (1971), when Japan opened borders widely to international trade in 1870s its real wages rose by 67 percent. The relative export commodity price increased by 33 percent and relative import commodity price fell by 39 percent.

Further advantage of trade openness is the possibility to decrease poverty. Winters, McCulloch, and McKay (2004) study stated trade openness widens the opportunity of economic activity which increases producer incomes of export products on international price, while give chances of lower consumption price from import products.

Feenstra (1998) analyzed trade integration in which production plants are disassembled to other countries and create global value chain. It showed share of manufacturing product increase compared to raw material and agricultural products and total imported intermediate input in the U.S industries increased from 5.7 percent in 1972 to 13.9 percent in 1990. The importance of international trade stimulates trade cooperation between countries which lead to an increasing number of trade agreements.

According to Garnaut (1998) "Open regionalism" is a setting to increase agreement between members without discriminating against non-members. The intra trade within ASEAN

members in 1965-1975 were similar with EU-12 but the total trade with countries outside region was higher than EU-12.

A positive effect of trade agreements showed in Anderson and Yotov (2016) study using augmented gravity model in which it increased members real income of manufacturing sectors and global efficiency from 0.3 percent in 1994 to 0.9 percent in 2002.

Policy changes in six ASEAN countries (i.e., Indonesia, Malaysia, Philippines, and Thailand) on import substitution increase trade of manufactured goods from 28 percent in 1980 to 61 as showed in Bowles (1997) study. The upsurge in trade occurred as the result of East Asia multinational company expansion (e.g., Japan and China) to four ASEAN members. Tariffs reduction is one of many trade policies that goal to increase trade flows.

According to Hew and Soesastro (2003) the accomplishment of tariff reduction in ASEAN boost higher economic integration in the region which aim not only free flows in trade but also in labor and financial movements.

It is noticeably that trade agreements offer benefits to members, however it might result differently. Campos (2016) presented example of trade agreements failure from the case of MERCOSUR, the Southern Common Market. The downfall of MERCOSUR started in 1998 and continued to 2012 when trade fell to 10 percent from 25 percent.

Another disintegration which affects trade cooperation and become great public debate was the decision of Great Britain to exit (Brexit) from the European Union (EU). Study by Reenen (2016) presumed that the decision taken in order to control immigration, arrange better policy and improve trade with non-EU countries (e.g., China, India) even though leaving EU might increase trade cost with EU members and lower national income.

Rana (2006) argued that ASEAN expansion to East Asia counterparts started in 1990s as the results of open-market policy. The integration of ASEAN plus three with China, Japan and Korea increased total trade from 30 percent to 38 percent. In line with previous study, Wong, and Chan (2003) showed that ASEAN contributed to 8.2 percent of China's foreign trade and become the fifth largest trading partner.

Richardson (2005) noted ASEAN larger integration in trade beyond the geographical boundary came into realization when Australia, New Zealand, and India joined the group discussion. Bano, Takahashi and Scrimgeour (2013) showed that trade increased to about 16 percent per year since the negotiation plans started in 2005. Batra (2007) believed when India joining ASEAN plus framework, it denotes large market-based integration which total trade share was 44 percent and become the largest among existing trade blocs.

Soloaga and Winters (2001) study found a negative effects on ASEAN integration in 1987-1995, however Nguyen (2019) found that RTAs significantly increase trade flows between members such as ASEAN and SAFTA.

METHODOLOGY

The first gravity model proposed by Tinbergen (1962) to explain bilateral trade between two countries. Adopting the same concept as gravity law, trade interaction of two countries can be explained from economic size, distance, and constant gravitational factor. It also used to analyze the effect of trade agreements on trade flows in many studies. Gravity model has been used for its power to explain the effect of trade cooperation (i.e., RTA, FTA) to trade flows as mentioned by Bayoumi and Eichengreen (1997). Trade determinants that often used on gravity model and described by Frankel (1997) are national output, distance, dummy variable of adjacency, dummy variable of language and dummy variable of common groups or blocs.

Baier and Bergstrand (2002) put distance, common language and adjacency variable as transactional cost that determined trade. The traditional gravity model can be written as follows:

$$X_{ij} = \beta_0 (GDP_i)^{\beta1} (GDP_j)^{\beta2} (DIST_{ij})^{\beta3} e^{\beta4(LANG_{ij})}$$

$$e^{\beta5(ADJ_{ij})} e^{\beta6(RTA_{ij})} \varepsilon_{ij} \qquad\qquad (1)$$

In equation 1, X_{ij} is trade value from exporter in country j to importer in country i. GDP_i and GDP_j are the GDP of country i and j, respectively. $DIST_{ij}$ is distance between country i and j. ADJ_{ij} is share of land border of country i and j. RTA_{ij} is the regional trade agreement joined by country i and j.

Carrere (2006) developed augmented gravity model based on Baier and Bergstrand (2002) theoretical framework. The relation of RTA to member trade flows (intra-trade) expressed in equation as follows:

$$lnX_{ijt} = \beta_0 + \beta_1 GDP_{it} + \beta_2 GDP_{jt} + \beta_3 \ln N_{jt} + \beta_4 Dist_{ij} + \beta_5 Lang_{ij} + \beta_6 ADJ_{ij} +$$

$$\beta_7 RER_{ijt} + \beta_6 ADJ_{ij} + \alpha_{intra} RTA_{intra} + \mu_{ijt} + \varepsilon_{ijt} \qquad\qquad (2)$$

In equation 2, N_j is the GDP per capita of country j, $Lang_{ij}$ is the dummy variable that has a value of 1 if country i and j share the same language and 0 otherwise, Adj_{ij} is a dummy variable that has a value of 1 if country i and j share the same land border and 0 otherwise, RER_{ij} is the bilateral real exchange rate of country i and j, and RTA_{intra} is a dummy variable for bilateral trade that has a value of 1 if country i and country j participate in the same RTA and 0 otherwise. α and β are the estimation coefficients of the dummy variables and the explanatory variables, respectively.

The real exchange rate (RER) was introduced in the study, as it is essential to captured country's competitiveness level, that is often ignored in previous studies. The real bilateral exchange rate is the ratio of the nominal exchange rate of country i and country j, divided by the consumer price index (CPI) of country j and country i. The coefficient signs for GDP, GDP per capita, language, adjacent, and RTA_{intra} are expected to be positive. Distance and the real bilateral exchange rate are expected to be negative. In that sense, a greater distance between two countries is assumed to reduce trade and the depreciation of the real exchange rate in the importing country towards a partner country's lower trade flows.

In accordance with previous literatures, this study adopting Carrere (2006) model and adding two dummy variables of bloc imports and bloc exports to analyze the post effects, in a sense that regional integration may discriminate non-members and alter the destination country from the rest of the world (ROW). Thus, the gravity model specification of intra and extra trade expressed as follows:

$$lnX_{ijt} = \beta_0 + \beta_1 GDP_{it} + \beta_2 GDP_{jt} + \beta_3 \ln N_{jt} + \beta_4 Dist_{ij} + \beta_5 Lang_{ij} + \beta_6 ADJ_{ij} +$$

$$\beta_7 RER_{ijt} + \beta_6 ADJ_{ij} + \alpha_{intra}RTA_{intra} + \alpha_x RTA_x + \alpha_m RTA_m + \mu_{ijt} + \varepsilon_{ijt} \quad (3)$$

In equation 3, RTA_x is a dummy variable with a value of 1 if the exporting country j belongs to the RTA, and the importing country i is not participating, and 0 otherwise, indicating the change of the bloc exports to the rest of the world. RTA_m has a value of 1 if the importing country i belongs to the RTA, and the exporting country j is not participating in the RTA, and 0 otherwise, indicating the change of the bloc imports from the rest of the world. It is to be expected that RTA intra-trade sign is positive in a sense it increases trade between members. However, the bloc-imports and bloc-exports sign can be both positive and negative which show the effect to non-members.

The early studies in trade flows typically used cross-sectional gravity model such as in Wang and Winter (1992), Frankel and Romer (1999), however this method gives biased method because it cannot control the unobserved heterogeneity embodied in trade relation. Econometric problems (e.g., endogeneity) can be occurred when unobserved heterogeneity appear in the model. Endogeneity issue raised firstly by Trefler (1993) and highlighted again in Baier and Bergstrand (2004, 2007) which pointed the cause of endogeneity (i.e., omitted variables, simultaneity error, measurement bias). Two acknowledged methods are Fixed Effects (FE) and Hausman and Taylor (HT). FE estimators commonly used, but it drops time invariant variables.

HT estimator developed by Hausman and Taylor (1981) to address unobserved heterogeneity. It developed from random effects model which accommodate time variant and invariant variable combined with Instrumental Variable (IV) to control heterogeneity, as described in appendix A.4. Cheng and Wall (2005) and Carrere (2006) used HT estimator for its robustness without omitting time invariant variables.

Time invariant variable estimation is important in this study. It is presumed, in ASEAN region, distance may not decrease trade flow with a notion that some of the members already have better facilities, competitive products, and thus more preferred as trade partner regardless the distance. Therefore, gravity model in equation 4 and HT estimator are used in this study to estimate the effect of regional trade agreements on ASEAN trade flows.

DATA AND ANALYSIS

Data

This study uses panel data set for ASEAN members and 60 partner countries covering the years of 1990-2019. The selection of partner countries is based on the largest value of trades with ASEAN that accounted for 94 percent of the total trade value in the last ten years. Countries

with an income of more than 70 percent from oil were excluded. The result of 60 partner countries selection presented in appendix A.1. The bilateral trade data was obtained from the Direction of the Statistic IMF. The nominal GDP of each country is from the World Bank. The nominal exchange rates are from the International Financial Statistic (IFS) IMF. The destination country GDP per capita data was calculated by dividing GDP by the population, which was obtained from the World Bank. The Consumer Price Index data were from the United Nations Conference on Trade and Development (UNCTAD) Statistics. The language, distance, and adjacency from the CEPII. The RTAs from World Trade Organization (WTO).

ANALYSIS

Cross-sectional Gravity Equation

Preliminary empirical support of cross-sectional data to analyse effect of RTA internally on member as described in equation (2) is taken using Ordinary Least Square (OLS) and presented in appendix A.2. The RTA used was divided into AFTA, ASEAN(CJK) which is group of ASEAN with East Asian countries of China, Japan, Korea, and ASEAN(ANI) which is group of the rest ASEAN partners (i.e., Australia, New Zealand, and India) that marked further integration outside East Asian region. The results show coefficients of GDP and distance are significant and have similar values in all periods. Variable of interest, AFTA coefficient shows significant results in 2000 and 2005 but insignificant for other years. Moreover, The ASEAN(CJK) variable is insignificant while ASEAN(ANI) significantly affects members trade flows. This result confirms that cross-sectional data yields inconsistent estimation across years. Therefore it is suggested to use Fixed Effect (FE) or Hausman Taylor (HT) estimator.

Panel Data Comparison of FE and HT Estimator

The statistical problem (i.e., heterogeneity) in the gravity equation has been a main interest of many studies. Some alternative methods in resolving unobserved individual effects in trade relation are Fixed Effect (FE) and Hausman-Taylor (HT) estimators. In a notion the capability to observe more variation across individual and time, panel data accommodates better examination. However, using FE will omit the time-invariant variable estimation.

Panel data comparison using equation 3, estimated in bilateral fixed effects, bilateral and time effects, and HT estimator presented in appendix A.3. The variable coefficients in column (1) and (2) are different in sign and magnitude. Using both bilateral fixed and time effects in column (2) lower most of the values and yield insignificant most of RTA variables. On contrary, using only bilateral trade fixed effect yield significant coefficients but omit time-invariant variable estimations.

Another plausible method is using HT estimator (column 3). The HT estimations show significance for all variables. The coefficient value of the HT estimators has similar result with the FE model in column (1). However, the advantage is the ability to estimate time-invariant coefficient. This provides a complete estimation of each determining variable included in the gravity model that cannot be accomplished with FE model. The time-invariant variables (i.e., distance, adjacent and language) reflect important information of ASEAN integration. Hence this study use HT estimator on gravity model.

RESULT AND DISCUSSION

ASEAN Trade Share

The World trade shows an increasing trend from 1990 to 2019. This upward trend was also observed in the ASEAN countries and their trading partners. Table 1 presents the share of the ASEAN, ASEAN+3 and ASEAN+6 trade share from the world trade in 1990-2019. ASEAN

trade contribution increased from 5.3% in 1990-1994 to 7.1% in 2015-2019. The average trade

share of ASEAN plus 3 (i.e., China, Japan, Korea) from the world trade was 17 percent in the

beginning and rose to about 25 percent in last five years.

Table 1. Share of ASEAN trade

Year	ASEAN	ASEAN +3	ASEAN +6
1990-1994	5.3%	17.2%	19.2%
1995-1999	6.2%	18.1%	20.1%
2000-2004	5.9%	19.0%	21.1%
2005-2009	5.9%	21.0%	23.8%
2010-2014	6.6%	24.3%	27.9%
2015-2019	7.1%	25.5%	29.0%

Source: UNCTAD Statistic, 2021, calculated by author.

Larger regional integration in trade occurred in ASEAN plus 6 which involves six countries

partner outside ASEAN adding Australia, New Zealand, and India. However, the additional

trade share in ASEAN plus 6 was not as higher as that in ASEAN plus 3. This illustrates

cooperation with East Asia fast growing economy in from of ASEAN plus 3 gives higher

possibility of gaining benefits from trade.

Applied Tariffs in ASEAN

A complete picture of applied tariff in ASEAN starts in 2000 after the last member; Cambodia,

joined in 1999 as presented in table 2. In 2000, Cambodia and Vietnam applied the highest tariff

among ASEAN members which above 15%, and due to data limitation tariff presented for both

countries using 2001 value. However, half of the members applied tariff lower than 5.5% in 2000 (i.e., Singapore, Malaysia, Myanmar, Philippines, and Indonesia).

Progress of tariff schedule reduction can be seen after 10 years. In 2010, 80 percent of members applied tariff lower than 5%, except for Cambodia and Lao PDR. Despite the fact that both countries are the least in tariff reduction, it depicts strong commitment to comply with ASEAN goals by 6 percent tariff reduction. In 2016, 90 percent of ASEAN members applied tariff was below 4.2 percent which lowest tariff were applied by Brunei (0.5%) and Singapore (0.7%). Overall, in more than 15 years, Vietnam and Lao PDR showed a great tariff reduction of around 12 percent. The tariff reduction portrays a strong commitment of ASEAN members.

Table 2. Applied Tariffs in ASEAN

	2000	2010	2016
Brunei Darussalam	7.85	2.51	0.50
Cambodia	16.43*	9.50	9.77
Indonesia	5.16	2.56	2.64
Lao PDR	14.06	8.09**	1.65
Malaysia	4.81	3.12	4.02
Myanmar	4.13	2.43	1.72***
Philippines	3.77	3.96	4.17
Singapore	0.04	0.05	0.07
Thailand	9.54	5.00	3.52***
Vietnam	15.29*	5.02	2.86

Source: The World Bank, 2021, calculated by author.

*Based on 2001 value, **based on 2007 value, ***based on 2015 value.

Hausman-Taylor Estimator on Gravity Equation

The sign of importer and exporter GDP coefficient shows positive and significant value at 1 percent level as in table 3. The GDP coefficient value of exporter and importer country are 1.044 and 0.468 percent point, respectively. In that sense, the exporter and importer GDP positively affects bilateral trade flow by 184 percent using formula $((e^{1.044} - 1) \times 100)$ and 60 percent $((e^{0.468} - 1) \times 100)$, respectively. The coefficient value of GDP per capita is negative and significant at the 1 percent level. GDP per capita is used as proxy of capital-endowment ratio which indicates the share of national output. Thus, an increase in exporter's GDP per capita will lower the trade flows to importer country by 41 percent.

Table 3. Hausman-Taylor estimation

Variables	Panel HT Coefficient	t
ln GDPi	0.468***	17.99
ln GDPj	1.044***	12.06
lnRERij	0.008	0.89
ln Nj	− 0.344***	− 4.01
AFTA	0.637***	7.67
AFTAx	0.635***	16.47

AFTAm	0.215***	5.59
ASEAN(CJK)	0.095*	1.78
ASEAN(CJK)m	-0.108***	-2.95
ASEAN(ANI)	0.208***	4.02
ASEAN(ANI)x	-0.077**	-2.18
ASEAN(ANI)m	0.372***	10.80
lnDISTij	4.227***	12.99
LANGij	3.148***	10.02
ADJij	10.720***	12.83
Constant	-57.305***	-22.46
Number of observations	33,275	
Number of country pairs	1,275	

Source: IMF Direction of Statistics, calculated by author

Standard errors in parentheses. ***, **, * significance at 1%, 5% and 10%, respectively

An interesting result appears from the HT estimation of distance coefficient which shows a positive sign. In previous studies, distance negatively affects trade flows which portray trade cost. A greater distance commonly associated with greater cost and will lessen the trade flows. In ASEAN trade integration, it can be assumed that distance among members and its partner countries have a less impact nowadays, not only because of the transportation and technology development but also the effectiveness of tariff reduction in ASEAN region. Another possible reason is some of members have better facilitates and product competitiveness which determines trade regardless the distance.

The language and adjacent coefficients are significant and positively increase the trade flow. The benefit of similarity in cultural characteristic and share the same land border with its East Asia counterparts increase the chance of trade cooperation and trade flows of ASEAN members. The real bilateral exchange rate sign is positive and insignificant which different from previous study. Theoretically, an increase of exchange rate in exporting country decrease trade in importing country or shows a negative effect. However, in practical, most exporters and importers use US$ as a common international currency in merchandise trading. Despite a small increase in Asian currencies usage such as renminbi and Japanese yen but has not been replaced the role of the US dollar in international trade.

The Effects of RTAs on ASEAN Trade Flows

The AFTA intra dummy variable coefficient in Table 3 has a positive sign and significantly increased the trade flow within member countries by 89 percent. AFTA bloc import variables and bloc export dummy variables are both positive and significant. The finding is different with Nguyen (2019) that showed insignificant RTA coefficient of ASEAN in both intra and extra trade bloc, and in Carrere (2006) that showed negative sign on import bloc. The positive sign on those variables indicates that for 30 years AFTA promotes imports and exports with the rest

of the world by 24 percent and 89 percent, respectively. Trade regionalism is often perceived to have a negative effect since it may divert trade and disrupt multilateral trade. Thus, AFTA is an example of a regionalism practice that promotes trade within member and non-member countries.

The second effect of RTA analyzed regarding trade cooperation outside ASEAN which division based on ASEAN historical cooperation. The coefficient of ASEAN(CJK) variable shows significant value at 10 percent level, and it increases trade between members (ASEAN, China, Japan, Korea) by 10 percent. The post effect of this integration to non-member is shown by the bloc import and bloc export dummy variables. The coefficient value of $ASEAN(CJK)_m$ is significant and it negatively affects trade flow by 11 percent. However, the bloc export variable effect, $ASEAN(CJK)_x$ is insignificant. The results indicate that the regional agreement in this group promotes intra-trade creation between members and also imports from non-member.

The ASEAN(ANI) coefficient shows a positive effect and significantly increases trade between members (i.e., ASEAN, Australia, New Zealand, and India) by 23 percent. The effect of trade agreements on the bloc export variable, $ASEAN(ANI)_x$ is negative and it reduces exports to the rest of the world by 8 percent. $ASEAN(ANI)_m$ coefficient shows positive sign and significant at 1 percent. Thus, it increases import from the rest of the world by 45 percent. The overall effect shows that ASEAN RTAs promote trade between member while slightly divert trade with the rest of the world.

Trade Direction in ASEAN Cooperation

Direction of trade in ASEAN cooperation can be seen from trade ratio (i.e., export and import) among ASEAN member and its trading partners compared to total trade. Table 4 presents the trade ratio of each member in 1995, 2005, and 2015. In this section, the trade ratio divided into

two categories of internal trade flows with fellow members (column 1) and external trade flows
with six trading partner countries (column 2) that integrated in the RTAs.

The ratio in column (1) of ASEAN new member in 1995; Cambodia (74%), Lao PDR (76%)
and Myanmar (41%), indicates high dependency with initial members in the region. In 2005
and 2015, the Myanmar and Lao PDR trade direction were not change much, while the
Cambodia ratio decreased to 17 percent which indicates tendency to trade more with non-
members. On contrary, initial members (e.g., Indonesia, Malaysia, Thailand) shows low
internal trade ratio below 25 percent on average for all years.

Table 4. Ratio of ASEAN trade compared to total trade

	1995		2005		2015	
	(1)	(2)	(1)	(2)	(1)	(2)
Brunei	0.35	0.47	0.22	0.72	0.28	0.58
Cambodia	0.74	0.10	0.17	0.14	0.23	0.32
Indonesia	0.15	0.41	0.23	0.40	0.25	0.40
Lao PDR	0.76	0.13	0.72	0.12	0.66	0.29
Malaysia	0.22	0.29	0.26	0.30	0.27	0.35
Myanmar	0.41	0.40	0.53	0.25	0.40	0.53
Philippines	0.12	0.29	0.18	0.31	0.20	0.37
Singapore	0.26	0.24	0.29	0.26	0.26	0.30
Thailand	0.17	0.33	0.20	0.34	0.23	0.37
Vietnam	0.26	0.36	0.22	0.38	0.13	0.44

Source: IMF Direction of Trade Statistics, 2021, calculated by the author.

The trade ratio of ASEAN member with 6 trading partners can be seen on column (2) in table 4. It is highly likely, members that show lower trade ratio internally as in column (1) will show higher trade ratio externally as in column (2). Overall, the total trade value of ASEAN to its trade partners shows an increasing trend in all years which indicates the succeed of external regional integration. Brunei and Indonesia trade to six countries were considerably high which accounted for more than 40 percent in all years. Accordingly, Cambodia and Lao PDR shows low ratio with six partners which about 20 percent on average.

The total ratio in column (1) and (2) can also give information of each member trade direction with the rest of the world. Singapore that known as trading hub maintains a similar share of both ratio in column (1) and (2) for about 25 percent each, in that sense it traded with the rest of the world up to 50 percent. In 2015, initial member (i.e., Indonesia, Malaysia, Philippines, and Thailand) showed total trade ratio around 60 percent which means each country traded with the rest of the word about 40 percent. On the other hand, Lao PDR and Myanmar total ratio were up to 90 percent which allowed small share of trading with other countries besides ASEAN and six trading partners.

Observing the ASEAN trade relationship internally and externally with its regional partner groups provides an understanding that in general each members follows the principles of the World Trade Organization in promoting multilateral trade. The concern of regionalism in the previous literature that isolate members from non-members may not happen in the ASEAN integration. The important factor to this success is the ability to maintain trade with non-member countries. In addition, trade agreements proposed by ASEAN can be considered as cross-regional agreement which indicates ASEAN intention to strengthen cooperation, not only with neighboring countries in East Asia, but also with countries in the Asia Pacific.

CONCLUSION

The effect of regional trade agreements (RTAs) on trade flow varies across group members. Findings in this study shows that AFTA, an internal cooperation within ASEAN members, has a positive and significant effect on trade flows, which increases trade by 89 percent. The post effect of extra-trade positively increases 24 percent of imports and 89 percent of exports to the rest of the world. The observation of RTAs effects outside ASEAN divided into two groups of ASEAN with China, Japan, and Korea to remark the integration with East Asia counterparts and group of ASEAN with Australia, New Zealand, and India. The results show that RTAs positively increase trade between members by 10 percent and 23 percent for ASEAN(CJK) and ASEAN(ANI), respectively. The post-effect analysis shows that RTAs gives benefit to intra-trade flow, while gives a small effect of trade diversion from the rest of the world.

Estimating RTA effect on trade flow raises challenges in separating its effect from other agreements. Moreover, the effect of the RTA may come far before it signed. Thus, longer observation period before RTA signed and needed to give a complete effects. Moreover, this study estimates the effects of six ASEAN RTAs for 30 years excluded Hong Kong RTA signed in 2019, thus it can be added in further studies. Regional cooperation and integration in ASEAN have been further advanced through ASEAN Economic Community which established in 2015. The aims are not only to increase cooperation in trade sector but also to deeply connect the labor force, investment, and financial sectors in the region. Thus, future studies can estimate the effects of deeper ASEAN integration on trade, investment, and employment.

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APPENDIX

A.1   Countries in the sample

Argentina	Ghana	Peru
Australia	Greece	Philippines
Austria	Hungary	Poland
Bangladesh	India	Portugal
Belgium	Indonesia	Romania
Brazil	Ireland	Russia
Brunei	Israel	Singapore
Bulgaria	Italy	Slovakia
Cambodia	Japan	Slovenia
Canada	Korea	South Africa
Chile	Lao PDR	Spain
China	Latvia	Sri Lanka

Colombia	Liberia	Sweden
Costa Rica	Lithuania	Switzerland
Costa Rice	Luxembourg	Taiwan
Croatia	Malaysia	Thailand
Cyprus	Malta	Turkey
Czech Republic	Mexico	Ukraine
Denmark	Myanmar	United Arab Emirates
Egypt	Netherlands	United Kingdom
Estonia	New Zealand	United States
Finland	Norway	Vietnam
France	Pakistan	
Germany	Panama	

A.2 Cross-section OLS gravity model

Variable	(1)	(2)	(3)	(4)	(5)
	1995	2000	2005	2010	2015
$\ln GDP_i$	1.076***	1.362***	1.453***	1.380***	1.390***
	(0.036)	(0.034)	(0.036)	(0.041)	(0.038)
$\ln GDP_j$	1.235***	1.330***	1.406***	1.444***	1.418***
	(0.034)	(0.034)	(0.036)	(0.040)	(0.038)
$\ln DIST_{ij}$	-1.340***	-1.301***	-1.334***	-1.390***	-1.270***
	(0.103)	(0.114)	(0.121)	(0.136)	(0.123)
$LANG_{ij}$	1.613***	1.369***	1.316***	1.157***	0.488*
	(0.235)	(0.251)	(0.259)	(0.278)	(0.256)
ADJ_{ij}	0.554	0.549	0.097	-0.084	0.414
	(0.418)	(0.438)	(0.454)	(0.473)	(0.440)
AFTA	0.553	0.927***	1.422***	-0.144	0.116
	(0.336)	(0.303)	(0.546)	(0.504)	(0.462)
ASEAN(CJK)			-0.160	0.082	-0.085
			(0.502)	(0.331)	(0.304)
ASEAN(ANI)				0.637**	0.550*
				(0.308)	(0.280)

Constant	-29.11***	-39.05***	-43.71***	-43.30***	-44.03***
	(1.555)	(1.634)	(1.772)	(1.914)	(1.793)
Observations	951	1,155	1,178	1,193	1,223
R-squared	0.679	0.717	0.704	0.668	0.694

Standard errors in parentheses. ***, **, * significance at 1%, 5% and 10% respectively

A.3 Comparison of panel data estimations (1990-2019)

VARIABLES	(1) With bilateral fixed effects	(2) With bilateral fixed and time effects	(3) Hausman-Taylor
ln GDPi	0.463***	0.372***	0.468***
	(0.025)	(0.028)	(0.026)
ln GDPj	0.987***	0.471***	1.044***
	(0.089)	(0.099)	(0.087)
ln Nj	-0.273***	0.151	-0.344***

	(0.091)	(0.098)	(0.086)
lnRERij	0.018*	0.020**	0.008
	(0.010)	(0.010)	(0.009)
AFTA	0.645***	0.499***	0.637***
	(0.080)	(0.092)	(0.083)
ASEAN(CJK)	0.094*	0.863	0.095*
	(0.052)	(0.873)	(0.053)
ASEAN(ANI)	0.209***	0.432	0.208***
	(0.050)	(0.865)	(0.052)
AFTAx	0.633***	0.535***	0.635***
	(0.037)	(0.051)	(0.039)
AFTAm	0.225***	0.087	0.215***
	(0.037)	(0.054)	(0.039)
ASEAN(CJK)x	-0.043	0.725	-0.044
	(0.036)	(0.872)	(0.037)
ASEAN(CJK)m	-0.109***	0.631	-0.108***
	(0.035)	(0.872)	(0.037)
ASEAN(ANI)x	-0.076**	0.114	-0.077**
	(0.034)	(0.865)	(0.035)
ASEAN(ANI)m	0.373***	0.533	0.372***
	(0.033)	(0.865)	(0.034)

$\ln DIST_{ij}$	-	-	4.227***
			(0.325)
$LANG_{ij}$	-	-	3.148***
			(0.314)
ADJ_{ij}	-	-	10.72***
			(0.835)
Constant	-17.83***	-6.413***	-57.31***
	(1.516)	(1.866)	(2.551)
Observations	33,275	33,275	33,275
R-squared	0.353	0.358	-
Number of country pair	1,275	1,275	1,275

Standard errors in parentheses. ***, **, * significance at 1%, 5% and 10% respectively