

Did China benefit from ACFTA?

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Abstract

In this article, I examined China's gain in total value of export to ASEAN countries from the establishment of ASEAN-China Free Trade Area (ACFTA). I used an extended form of gravity model to capture the demographic characteristics of ASEAN countries and China. On the top of that, by adding a dummy variable indicating the establishment of ACFTA, I tested the effect of ACFTA on China's exports. Regression results showed that ACFTA had small and positive effect on China's exports to ASEAN countries, but the effect was not very significant. The insignificant effect could be a result of insufficient sample size or lagging effect.

I. INTRODUCTION

THE ASEAN-China Free Trade Area (ACFTA), also known as China-ASEAN Free Trade Area, is a free trade area among the ten member states of the Association of Southeast Asian Nations (ASEAN) and the People's Republic of China. The initial framework agreement was signed on 4 November 2002 in Phnom Penh, Cambodia, with the intention to establish a free trade area among the eleven nations by 2010. The free trade area came into effect on January 1st 2010. The ASEAN-China Free Trade Area is the largest free trade area in terms of population and third largest in terms of nominal GDP. The establishment of ACFTA has been considered as a sign of Asia's rising role in world trade, as well as China's increasing influence on Asian economy. As a result of the agreement, average tariffs on imports of ASEAN-origin exports to China were lowered from 9.8 percent to 0.1 percent. The average tariff on China's exports to the original six ASEAN members (Brunei, Indonesia, Malaysia, the Philippines, Singapore, and Thailand) was reduced from 12.8 percent to 0.6 percent (Salidjanova, 2015). In this article, I examined the benefits of China. I attempted to answer two questions in this article: Did China benefit from this trading

agreement? If so, how much did China benefit from it?

II. METHODS

This article employs an extended gravity model developed by Wang and Liu (2010), based on the work of Baltagi and Pfaffermayr (2003), to investigate the influence of simple economic factors on bilateral trade flows between China and the ASEAN members. Gravity model has been widely used in estimating bilateral trading value. Using a panel data framework, the equation is specified as follows:

$$\begin{aligned}
 y_{ijt} = & \beta_0 FTA_t + \beta_1 LGDPT_{ijt} + \beta_2 LSIMGDP_{ijt} \\
 & + \beta_3 LFDIT_{ijt} + \beta_4 LSIMFDS_{ijt} \\
 & + \beta_5 LRFAC_{ijt} + \beta_6 LGD_{ijt} \\
 & + \beta_7 DUMContig_{ij} + \beta_8 DUMLand_{ij} \\
 & + \beta_9 DUMComlang_{ij} + \gamma_t + \epsilon_{ijt}
 \end{aligned} \tag{1}$$

where y denotes the logarithm of real bilateral exports of country i to country j at year t , γ_t is fixed time effects, and ϵ_{ijt} is error term. Other explanatory variables are calculated as follows.

- $LGDPT_{ijt} = \log(GDP_{it} + GDP_{jt})$
- $LSIMGDP_{ijt} = \log(1 - s_i^2 - s_j^2)$ describes the similarity in GDP between two

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trading partners, where s_i is the share of country i 's GDP in the joint GDP of trading partners.

- $LFDIT_{ijt} = \log(S_{it} + S_{jt})$, where S_{it} is the inward FDI stock to country i at time t .
- $LSIMFDS_{ijt} = \log(1 - q_{it}^2 - q_{jt}^2)$, where q_i is the share of country i 's inward FDI stock in the joint inward FDI stock of trading partners.
- $LRFAC_{ijt} = |\log(\frac{GDP_{it}}{capita_{it}}) - \log(\frac{GDP_{jt}}{capita_{jt}})|$ denotes the relative factor endowments in i and j .
- $LGD_{ijt} = \log(dist_{ij})$, where $dist_{ij}$ denotes the geographical distance between country i and j , which is calculated as the distance between capitals.
- $DUMContig_{ij}$ is dummy variable, = 1 if country i and j are contiguous.
- $DUMLand_{ij}$ is dummy variable, = 1 if either country i or j is a land-locked country.
- $DUMComlang_{ij}$ is dummy variable, = 1 if country i and j share a common official language.

Since this article examines one-way bilateral trade flows, country i refers specifically to China. Moreover, I use a dummy variable FTA_t to indicate the establishment of ACFTA.

III. DATA

Total GDP and per capita GDP are measured at current international dollars¹, and the data came from World Bank. Data of inward FDI stock are obtained from International Comparison Program database. Data of total trading value of exports came from World Integrated Trade Solution (WITS). I collected data from 2000 to 2014. Figure 1(a) shows the trend of total value of exports to ASEAN countries from 2000 to 2014. No apparent discontinuity is exhibited at year 2010. Figure 1(b) presents the total value of imports from China by country. Brunei, Cambodia, Laos, and Myanmar showed dramatic increase after

2010. Table 1 presents the average growth rate of GDP, inward FDI stock and trading value. The growth rates in Table 1 are higher than common expectation, because the values are measured at current international dollars. Roughly, since 2010, most ASEAN countries experienced some level of increase in the growth rate of imports from China, but whether that is caused by ACFTA is unclear.

IV. EMPIRICAL FINDINGS

The first three columns of Table 2 presents the estimation of Equation 1 using exports of all products as dependent variable. Because none of the estimated coefficients on year dummies was significantly different from zero at 5% significance level in fixed effect (FE) or random effect (RE) model, I excluded year dummies from FE and RE model. One may argue that time fixed effect plays a crucial role in the model, but I believe group-invariant shocks such as the 2008 financial crisis are mostly captured by changes in GDP and FDI.

In the last three columns, Table 2 also presents the estimation of Equation 1 using exports by products as dependent variable, which is an approach used by Sheng and Tang (2012). Although this model is presented in the table, the methodology behind Sheng and Tang (2012) model is doubtful. It's hard to argue that aggregated variables can significantly affect product-level values, i.e., similarity in GDP may not significantly affect a country's export of seed. A more reasonable approach is to regress exports of a specific product on the proportion of that product in GDP. But due to data limitation, that cannot be done in this article. Therefore, I did not change the explanatory variables in the last three columns in Table 2. Another shortcoming of this approach is that the "treatment" is misspecified, as ACFTA does not cut tariff on every product. FTA_t should only be equal to 1 for those products that are affected by ACFTA. Setting $FTA_t = 1$ for all observations after 2010 will

¹GDP are converted to international dollars using purchasing power parity rates. An international dollar has the same purchasing power over GDP as the U.S. dollar has in the United States.

Table 1: Summary statistics of growth rates from 2000 to 2014

	GDP	Inward FDI stock	Total value of imports from China	
			pre 2010	post 2010
Brunei	2.82	3.29	30.25	65.55
Cambodia	9.26	15.11	20.92	29.28
Indonesia	6.97	16.67	19.06	21.55
Laos	8.88	12.90	30.45	37.32
Malaysia	6.46	6.40	25.37	18.75
Myanmar	—	10.88	18.35	32.88
Philippines	6.70	9.95	21.71	22.29
Singapore	6.96	15.11	20.15	10.22
Thailand	5.79	13.22	21.87	20.84
Vietnam	7.91	12.91	30.00	31.35
China	12.01	13.11	—	—
ASEAN	7.30	14.49	22.32	20.68

^a — data missing

cause bias. Unfortunately, it is impossible to obtain the tariff profile of ACFTA. Treating all products as a whole will cause bias as well, but the bias is smaller on average comparing to breaking down products into HS 1998 2 digit categories.

Among pooled OLS, RE and FE models, RE estimator is chosen for the following reasons, despite the fact that the fixed effects estimator is much more common in gravity models than the RE estimator. The RE estimator has the advantage of not requiring the exclusion of variables that are time invariant. In this case, logarithm of distance (LGD), border or contiguity effects (DUMContig), landlocked effects (DUMLand) and common language (DUMComlang) are invariant across time periods, and these variables are of considerable interest to this study. Furthermore, all of the variables exhibit more variation in the data across country group (between variation) than over time (within variation). This is not surprising given the large number of cross-section entities (based on country-pair-product groups) used for the estimations, which are to have some influence on bilateral exports. As such, a FE model may not work well for data with minimal within variation or for variables that change slowly over time (Devadason,

2014).

I also used exports by sectors (industrial, agricultural, petroleum) as dependent variable to estimate Equation 1, but none of the estimated coefficients in this regression is significantly different from zero, and therefore it was excluded in Table 2.

V. CONCLUSION

As analyzed in the previous section, RE model is most appropriate. When regressing total exports on explanatory variables, RE model shows that the establishment of ACFTA increased China's exports to ASEAN countries by approximately 9%, but not very significant. This conclusion is not consistent with common expectation. This phenomenon might be a result of:

- The model didn't take into account the interindustry differences. ACFTA does not cut tariff on all product categories, so taking all products as a whole may reduce the effect of ACFTA.
- Sample size is not sufficiently adequate. Since there are only 10 countries and 15 time points, the total number of observations is considered small.

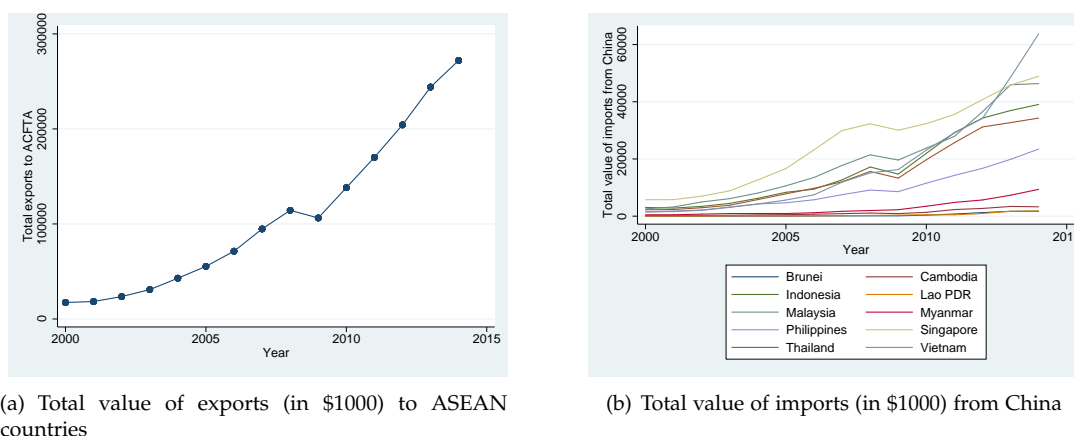


Figure 1: Total value of exports by country and ASEAN as a whole

Table 2: Regression results

	Total products			HS 1988 2 digit		
	OLS	RE	FE	OLS	RE	FE
FTA	2.01**	0.09	0.12	2.44***	-7.94**	-6.70**
LGDPT	0.65	1.74***	1.56***	0.66	8.71***	6.74***
LSIMGDP	0.42**	0.40**	-1.75***	0.73***	0.64***	-1.25***
LRFAC	-0.63	-0.59***	0.18*	-0.23**	-0.06	0.26***
LFDIT	0.11	0.24	-0.21	-0.18	-1.31***	-0.82**
LSIMFDS	0.41	0.41	0.04	0.37***	0.12***	0.07**
LDG	-0.23	-0.43	-	-0.57	-1.28**	-
DUMContig	0.72*	0.68**	-	0.40	0.47	-
DUMLand	-1.11*	-1.10*	-	-0.80**	-2.04***	-
DUMComlang	2.00	1.94	-	1.21**	2.62***	-
Year Dummy	Yes	No	No	Yes	Yes	Yes
R^2_{adj}	0.9964	0.9377	0.267	0.5002	0.4688	0.4764
Obs.	138	138	138	12,327	12,327	12,327

^b Asterisks indicates level of significance: ***=1% level, **=5% level, *=10% level.

^c Cluster standard error used.

Significant results may occur when expanding the model to multi-industries regression.

- Probably the most important reason is that ACFTA's effect has not been fully fulfilled, e.g., ACFTA agreements allows each country to register hundreds of sensitive goods such as electronic equipment, automotive vehicles and parts, and chemicals that are not subject to tariff reductions until 2020 (Salidjanova, 2015). Also, Chinese firms

need more time to adjust producing volume. ACFTA was established in 2010, and there are only four time points since then, so it is possible that the effect of ACFTA has not been fully revealed in the data.

- The establishment of ACFTA has been widely seen as China wielding its political power upon ASEAN countries. Although the original purpose of ACFTA was to benefit China in terms of its exporting-backed economy, the same

logic may not appeal to the ASEAN countries. As a response to ACFTA, some ASEAN countries may increase their non-tariff barriers to prevent China's cheap products pouring into their domestic markets. The two effects canceled each other.

On the other hand, surprisingly, when using exports by products as dependent variable, regression results indicate that ACFTA significantly reduce China's exports to ASEAN countries. Sheng and Tang (2012) also used intra-industry imports as dependent variable to estimate a similar gravity model and found that ACFTA significantly increased the trading value. Despite the slight difference in independent variables between this study and Sheng and Tang (2012), the huge difference in estimation results is still beyond explanation. Nevertheless, as analyzed in the previous section, the reliability of this model is doubtful and conclusion about ACFTA's effect on exports should not be drawn based on this model.

As for this article, the conclusion is ACFTA has not significantly benefited China in terms of its exports. The marginal effect of ACFTA on China's exports to ASEAN is very likely to become significantly larger than zero in the next few years. We may be able to show more accurate conclusions in a few years when the sample size is large enough for regression.

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