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Measuring the Costs of FTA Utilization: Evidence from Transaction-level Import Data of Thailand

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Abstract: *In this paper, we measure the costs for utilization of free trade agreement (FTA) tariff schemes. To do that, we use shipment-level Customs data on Thai imports, which identify not only the firms, source country, and commodity, but also the tariff schemes. We propose several measures as a proxy for the FTA utilization costs. The example includes the minimum amount of firm level saving of tariff payments, i.e. trade values under FTA schemes multiplied by the tariff margin, in all transactions. As a result, for example, the median costs for FTA utilization are estimated to be around two thousand US dollars in the case of exporting from China and around one thousand US dollars in the case of exporting from Korea. We also found that FTA utilization costs differ by rule of origin and industry.*

Keywords: FTA; Fixed costs; Thailand

JEL Classification: F15; F53

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1. Introduction

The cost for use of free trade agreement (FTA) tariff schemes has become an important issue in the policy discussions about FTAs. When exporting to FTA member countries, firms can enjoy the benefit of using FTA tariff rates, which are lower than the general tariff rates, such as the most favored nation (MFN) rates. However, in general, FTA users need to bear some costs. FTA users must comply with the rules of origin (RoOs), in order to take advantage of using FTA tariff schemes. To certify the "originality" of their products, exporters must submit various documents including a list of inputs, production flow chart, production instructions, invoices for each input, contract documents, and so on. For this documentation work, the exporters may establish a division or assign staff in charge of FTA utilization. With these documents, exporters apply for certificates of origin (CoOs) to the authority, in order to use the FTA tariff schemes. This kind of documentation incurs some costs for FTA utilization. As a result, even when exporting to FTA member countries, only productive exporters who can earn enough benefit to offset these costs will be able to use FTA schemes.[1]

Several studies have estimated the costs for FTA utilization. Applying the threshold regression approach to the utilization rate of Cotonou preferences, Francois *et al.* (2006) found that the tariff equivalent costs of using the scheme ranged between 4 percent and 4.5 percent. Hayakawa (2011) showed that by employing the threshold regression method that the average tariff equivalent of fixed costs for use of FTA for all existing FTAs in the world is estimated to be around 3 percent. Cadot and de Melo (2007) is a survey article on this literature, concluding that such fixed costs range between 3 percent and 5 percent

[1] Demidova and Krishna (2008) introduces the choice of tariff schemes into the firm-heterogeneity model of Melitz (2003) and theoretically demonstrates that productive firms use FTA schemes for exporting while the less productive firms use MFN schemes for exporting.

of the product price. Some studies estimated the absolute values of FTA utilization costs. Ulloa and Wagner (2013) computed the costs directly by employing the data on FTA utilization for exports from Chile to the U.S. They found that the 75th percentile was around US$3,000 in the year of entry into force (around US$200 for the median) and the costs decreased by 60-80 percent in the following one to two years. By employing the firm level data from the Generalized System of Preferences (GSP) utilization for exporting apparel products to Europe from Bangladesh and by developing the theoretical model on firms' preferential scheme utilization, Cherkashin *et al.* (2015) structurally estimated the costs (they called these the documentation costs of RoO compliance), which were US$4,240.[2]

In this paper, by following the approach adopted in Ulloa and Wagner (2013), we add new evidence on the costs for FTA utilization to that literature. According to some mild assumptions, they theoretically showed that the FTA utilization (fixed) costs are equal to the tariff margin (i.e. the difference between the MFN rates and FTA rates) multiplied by the exports (we call this the saving amount of tariff payments), under the situation where total profits from FTA use and non-use become the same. A challenging issue is how to obtain such a level of exports, or "cutoff exports". Ulloa and Wagner (2013) obtained the data by estimating the cumulative density of exports. From the theoretical point of view, the cumulative density *at* the cutoff exports becomes equal to the share of exports under MFN schemes. Thus, with the cumulative density of exports for each product and the product level data fir FTA utilization, they can compute the cutoff exports.

Our detailed data on firms' FTA utilization enable us to measure FTA utilization costs

[2] Das *et al.* (2007) structurally estimated the fixed costs of entry to export markets. They found that the sunk components are around four hundred thousand US dollars and that the annual fixed costs are almost zero.

more directly and simply compared to the previous studies. Our dataset is shipment level Customs data for Thai imports. This has information not only on the firms, source countries, and commodities, but also on the tariff schemes (e.g., FTA scheme or MFN scheme) used for the imports. Recently, several empirical papers used shipment level data (e.g. Amiti *et al.*, 2014; Berman *et al*. 2012; Eaton *et al.*, 2011). However, no studies have used that data to enable us to identify tariff schemes.[3] With this dataset, for example, as the cutoff exports, we can identify the minimum firm level trade values under FTA schemes or the maximum firm level trade values under MFN schemes. That is, without imposing any strong assumption on functional form on the distribution of trade values (i.e., productivity), we can compute the costs for FTA utilization. Using the estimates on FTA utilization costs, we examine the differences in the FTA utilization costs across various dimensions such as industry or rules of origin (RoOs).

The rest of this paper is organized as follows. The next section, Section 2, explains our methodology for measuring FTA utilization costs. Section 3 provides an overview of our dataset. Section 4 reports the estimates for FTA utilization costs and examines differences across industries and RoOs. Finally, Section 5 concludes this paper.

2. The Methodology

In this section, we explain our methodology for quantifying the FTA utilization costs. The idea behind this is simple.[4] Exporters are heterogeneous in terms of productivity. The exporters with the higher productivity are more likely to use FTA schemes for

[3] The exception is Cherkashin *et al*. (2015). However, their data set includes only data for the apparel industry. On the other hand, our data set covers all industries.

[4] For more details, see Ulloa and Wagner (2013).

exporting because such firms in general have a larger export volume and thus the larger amount of saving in tariff payments through the use of FTA tariff rates (i.e. benefit from FTA utilization). From the theoretical point of view, such benefit should be equal to the cost for FTA utilization for a firm with productivity for which the total profit from FTA use becomes indifferent from that from the use of MFN rates (i.e. productivity cutoff between FTA use and non-use). That is, the saving amount of tariff payments for a firm with cutoff productivity can be seen as the cost for FTA utilization.

Therefore, a critical issue is how to identify a firm with suitable cutoff productivity. From the empirical point of view, two kinds of firm are candidates for such a study. One is a firm with minimum exports under the FTA scheme, while the other is a firm with maximum exports under the MFN scheme. Theoretically the difference between the minimum exports under FTA rates and the maximum exports under MFN rates should be zero or negligible. However, in reality, the difference may be large. Furthermore, there may be the cases that the maximum exports under MFN rates exceed the minimum exports under FTA rates.[5]

Considering the difference between these two kinds of exports, we propose some measures. Since our dataset is for import data, below we explain our method from the import side. We define the saving amount of tariff payments for firm *f*'s imports of product *p* from country *i* in a year *t* as follows.

$$S^S_{fipt} = \left(MFN_{ipt} - FTA_{ipt}\right) \times IMP^S_{fipt}.$$

MFN_{ipt} and FTA_{ipt} are MFN rates and FTA rates for importing product *p* from country *i* in year *t*, respectively. IMP^S_{fipt} denotes firm *f*'s imports of product *p* from country *i* in year *t* under scheme *S* (i.e. *S* = {FTA scheme, MFN scheme}). Based on the above discussion on cutoff firms, we compute the saving amount of tariff payments by employing not only the trade values under FTA schemes but also those under MFN schemes.[6] As a result,

[5] This case does not happen in the theoretical model by Ulloa and Wagner (2013) or Demidova and Krishna (2008) because they assume the "pecking-order" nature between a firm's productivity and the choice to use a FTA.

[6] The use of imports under MFN schemes is because, as mentioned above, those values might be closer to imports by exporters with cutoff productivity. However, notice that (*MFN* − *FTA*) * *IMP* exactly shows the *actual* saving amount of tariff payments only when we compute a variable *IMP* by employing imports under FTA schemes, not MFN schemes. Namely, we use (*MFN* − *FTA*) * *IMP* to

when there are both FTA users and non-users importing product *p* from country *i* in year *t* (we call this case "partial utilization"), the FTA utilization costs for importing product *p* from country *i* in year *t* (denoted by $Cost_{ipt}$) lie within the following range.

$$Cost_{ipt} \in \begin{cases} \left(\max_f\{S_{fipt}^{MFN}\}, \min_f\{S_{fipt}^{FTA}\}\right] & if \max_f\{S_{fipt}^{MFN}\} \leq \min_f\{S_{fipt}^{FTA}\} \\ \left[\min_f\{S_{fipt}^{FTA}\}, \max_f\{S_{fipt}^{MFN}\}\right) & if \max_f\{S_{fipt}^{MFN}\} > \min_f\{S_{fipt}^{FTA}\} \end{cases}.$$

There are two other cases to be considered. One is that there are no FTA users (called "no utilization"), while the other is that all firms import under FTA rates (called "full utilization"). These cases happen because the number of firms is finite in any country and productivity distribution has some support (i.e. lowest and highest productivity levels).[7] As a result, in the case of no utilization, the FTA utilization costs will lie within the following range.

$$Cost_{ipt} \in \left(\max_f\{S_{fipt}^{MFN}\}, \infty\right).$$

Namely, the case of no utilization implies that the observed maximum amount of tariff saving is not large enough to cover the FTA utilization costs. In the case of full utilization, the range of FTA utilization costs can be shown as follows.

$$Cost_{ipt} \in \left[0, \min_f\{S_{fipt}^{FTA}\}\right].$$

This case implies that even the observed minimum amount of tariff saving can cover the FTA utilization costs.

Later, we take an overview of some basic statistics for FTA utilization costs. For this convenience, we define our estimated *point* for these costs as follows.

compute the *hypothetical* saving amount of tariff payments for exporters with cutoff productivity.

[7] Helpman *et al.* (2008) assume the cumulative productivity distribution function with support in specifying the gravity equation.

$$\begin{cases} \left(\max_f\{S_{fipt}^{MFN}\} + \min_f\{S_{fipt}^{FTA}\}\right)/2 & in\ the\ case\ of\ partial\ utilization \\ \max_f\{S_{fipt}^{MFN}\} & in\ the\ case\ of\ no\ utilization \\ \min_f\{S_{fipt}^{FTA}\} & in\ the\ case\ of\ full\ utilization \end{cases}.$$

Namely, our estimated point is at the lower boundary of FTA utilization costs in the case of no utilization and at the upper boundary of FTA utilization costs in the case of full utilization. As a confirmation, we also define the estimated point in the case of partial utilization as $\max_f\{S_{fipt}^{MFN}\}$ or $\min_f\{S_{fipt}^{FTA}\}$.

Last, there are four noteworthy points. First, we can compute the FTA utilization costs only for products with positive imports under any tariff scheme. Second, firms may decide FTA utilization based on the future inter-temporal benefits or the benefits for each shipment, rather than that for annual benefits. Thus, we calculate the FTA utilization costs by employing not only the annual import data but also the import data based on another time-dimension, i.e., daily import data. Third, our estimated FTA utilization costs include not only fixed costs but also variable costs (if any). In complying with the RoO, FTA users may need to change their procurement sources from the optimal sources, and suffer from the rise of variable costs.[8] In the above method, we cannot differentiate variable and fixed costs for FTA utilization. Fourth, since our dataset is import data (not export data), a firm may import a product from a country under both FTA rates and MFN rates. This is likely to happen if the firm imports from multiple exporters (e.g. productive exporters and less productive exporters). In our calculation, we include both kinds of imports.

[8] Demidova and Krishna (2008) assume such rise of variable costs when using FTA schemes for exporting.

3. Overview of the Dataset

Before calculating the FTA utilization costs, we take a brief overview of several tables about FTA utilization costs and trade under FTA schemes. Table 1 shows the fees for issuance of CoOs in major Asia-Pacific countries. Such fees are one of the observable costs for FTA utilization. The fee is relatively expensive in developed countries such as Australia, Japan, and New Zealand. In addition to these developed countries, it is also expensive in Cambodia, amounting to 50US dollars (15US dollars for small quantities). In most other countries, the fee is trivial. In Thailand, for example, it is free of charge in the case of online certification and one dollar in the case of manual certification. It is also free of charge for exporting from Korea. If the total costs for FTA utilization are in general around four thousand US dollars as estimated in the previous studies, the fees for issuing CoOs will occupy a trivial share of the total costs.

Table 1: CoO Fees as of 2013 (US Dollars)

	Fee	Notes
Australia	21-57	Different according to industrial member status
Brunei	1.6	
Cambodia	50	15 for small quantity
China	6.3	
India	7	In addition to on-site examination fee
Indonesia	0.5	
Japan	25.1	
Korea	0	
Lao PDR	5-12.5	Different according to invoice values
Malaysia	0.4	Paper charge
Myanmar	3.9	
New Zealand	28	
Philippines	3.1	
Singapore	5.98	Online case. 8 for manual
Thailand	0	Online case. 1 for manual
Viet Nam	1	Paper charge

Source: Investigation by the Japan External Trade Organization.

In the following, we present an overview of our dataset. As of January 2014, Thailand has concluded several FTAs.[9] Since the launch of the ASEAN Free Trade Area (AFTA) in 1993, Thailand has signed and implemented five bilateral FTAs with Australia, New Zealand, India, Japan, and Peru. In addition, Thailand, together with the other ASEAN members, has concluded five regional agreements with China (ASEAN-China FTA, ACFTA), Japan, Korea (ASEAN-Korea FTA, AKFTA), India, Australia and New Zealand. In this paper, we focus on Thai imports from China and Korea, namely ACFTA and AKFTA because, except for these two countries and Peru, Thailand has both bilateral and multilateral FTA schemes with the other FTA partners. In the case of multiple FTA schemes, the firms' decision on FTA use will be qualitatively different; firms will choose the tariff scheme from among the MFN rates, bilateral FTA rates, and multilateral FTA rates rather than simply from between the MFN and FTA rates. Since it is beyond the scope of this paper to take into account such complicated decisions on tariff schemes, we simply focus on trading pairs in which only a single FTA scheme is available, i.e., China and Korea. Thailand became a member of ACFTA in 2005 and AKFTA in 2010.

Our dataset contains transaction level import data from 2007 to 2011 and covers all commodity imports into Thailand.[10] Based on this data we calculated the FTA utilization costs for five years (2007-2011) in the case of ACFTA, and two years (2010, 2011) in the case of AKFTA. Our dataset contains the Customs clearing date, Harmonized System (HS) eight-digit code, export country, firm's ID, tariff scheme (e.g., MFN, FTA), and import value in Thai Baht (THB). Basically, as mentioned in the previous section, we use the data on imports aggregated according to years in addition to the HS eight-digit code, export countries (i.e. China and Korea), firms, and tariff schemes. We call this dataset the "Annual data". Later, we also employ data on imports aggregated from the daily imports, which we call the "Daily data". We classify tariff schemes into three categories including MFN, FTA, and the other schemes. The other schemes include imports under schemes of bonded warehouses, free zones, investment promotions, duty drawbacks under Section 19 bis, and duty drawbacks for re-exports.[11] Although the choice of such other schemes

[9] The list of FTAs by Thailand is available in Table A1 in the Appendix.

[10] As mentioned in the introduction section, this data set is confidential and obtained from the Customs Department, Kingdom of Thailand.

[11] Goods imported under the schemes of bonded warehouses, free zones, and investment promotions may be exempt from Customs duties subject to certain conditions. The duty drawback under Section

have important implications in our analysis (as in the above-mentioned case of choices among MFN and multiple FTA schemes), we do not consider them and focus only on the MFN and FTA schemes when calculating the FTA utilization costs.

Table 2 reports the basic statistics on firm level annual imports. In the column "# of Eligible Products", we can see that the number of products eligible for ACFTA increased substantially in 2009 and 2010. The increase in 2009 was particularly notable. On the other hand, the number of products eligible for AKFTA has been large since the first year of its entry into force and did not change between 2010 and 2011. The column "# of Import Firms" shows a larger number of importers from China than from Korea. In both cases of China and Korea, the number of importers under MFN is the largest. However, importers from China under the FTA scheme increased remarkably during the sample period. Similar findings are available for the import values, as shown in the column "Import Values". The increase of the import value by China under FTA is remarkable. The import value by China under FTA surpassed the corresponding value by MFN in 2010 and the gap increased in 2011.

Two additional findings are of interest in Table 2. From the column of "Average Import Values", we can see larger firm level import values under FTA schemes than under MFN schemes, although those under Others are significantly larger in the case of imports from China. The larger values under the FTA schemes are consistent with the findings of higher FTA utilization for products with larger trade values in the previous studies on the determinants of FTA utilization (e.g. Hayakawa *et al.*, 2014). In this table, we also report the FTA utilization rates, of which the numerator is the import values under FTA schemes and the denominators are either the import values under the FTA and MFN schemes or those under all the schemes. In either case, the FTA utilization rates have risen over time.

19 bis or for re-exports enables exporting firms to obtain a refund of the Customs duty paid for imported goods when such goods are inputs for goods for export or are re-exported without any transformation. Under these schemes, only firms approved by the authorities in charge can claim such privileges. Eligible imported goods and duty privileges vary among the schemes. For example, virtually all goods imported under bonded warehouse and free zone schemes are duty-free. Under the investment promotion scheme, raw materials are duty-free while machinery may be either duty-free or subject to a 50 percent tariff reduction. On the other hand, machinery is ineligible for a refund on import duty paid under duty drawback schemes.

Table 2: Import Firms, Import Values, and FTA Utilization

	# of Eligible Products	# of Import Firms			Import Values (Bil. THB)			Average Import Values (Mil. THB)			FTA Utilization (Denominator)	
					(I)	(II)	(III)					
		MFN	FTA	Others	MFN	FTA	Others	MFN	FTA	Others	(I)+(II)	(I)+(II)+(III)
From China												
2007	2,415	9,922	358	2,147	39	3	24	4	7	11	6%	4%
2008	2,415	10,511	1,901	2,418	30	23	30	3	12	13	44%	28%
2009	4,897	18,068	4,083	2,763	90	53	82	5	13	30	37%	23%
2010	5,893	19,992	8,380	2,718	108	126	135	5	15	50	54%	34%
2011	5,893	20,716	10,392	2,723	128	185	138	6	18	51	59%	41%
From Korea												
2010	5,773	5,177	881	1,031	30	15	55	6	17	53	33%	15%
2011	5,773	5,342	1,212	990	31	30	45	6	25	46	49%	28%

Source: Customs Department, Kingdom of Thailand.

Table 3 reports the basic statistics at a firm's product level. In this table, we employ both Annual data and Daily data. The trend is similar to that in Table 2. The number of transactions is larger under MFN than under FTA, but that under FTA increases more dramatically. In the case of Annual data, in 2011, the number of transactions under FTA schemes amounted to more than sixty thousand in the case of imports from China and to more than two thousand in the case of imports from Korea. The number of transactions in the case of Daily data was more than three hundred thousand in the case of imports from China and more than ten thousand in the case of imports from Korea. Also, the average import values are larger under FTA than MFN. In the case of Annual data, in 2011, the average import values under the FTA schemes are nearly three million THB in the case of imports from China and nearly fourteen million THB in the case of imports from Korea. The corresponding figures in the case of Daily data are nearly six hundred thousand THB in the case of imports from China and nearly three million THB in the case of imports from Korea.[12]

Table 3: Transaction-level Import Values

	# of Eligible Products	# of Transactions			Average Import Values (Thousand THB)		
		MFN	FTA	Others	MFN	FTA	Others
Annual Data							
From China							
2007	2,415	46,406	1,885	8,551	830	1,395	2,846
2008	2,415	46,180	10,458	7,512	643	2,209	4,041
2009	4,897	99,966	27,622	12,026	895	1,905	6,817
2010	5,893	113,684	52,231	15,311	951	2,413	8,810
2011	5,893	117,667	61,922	15,123	1,091	2,982	9,110
From Korea							
2010	5,773	21,152	1,611	4,979	1,422	9,061	10,992
2011	5,773	22,494	2,192	5,154	1,399	13,668	8,801
Daily Data							
From China							
2007	2,415	162,011	13,540	51,851	238	194	469
2008	2,415	158,867	64,352	48,952	187	359	620
2009	4,897	353,266	140,081	122,208	253	376	671
2010	5,893	422,480	273,340	169,923	256	461	794
2011	5,893	445,254	320,717	163,129	288	576	845
From Korea							
2010	5,773	76,045	7,062	46,667	395	2,067	1,173
2011	5,773	82,124	11,565	43,047	383	2,591	1,054

Source: Customs Department, Kingdom of Thailand.

[12] In the Appendix, Table A2 reports the number of products according to the FTA utilization status and the distribution of tariff margin is presented in Table A3.

4. FTA Utilization Costs

In this section, following the method proposed in Section 2, we calculated the FTA utilization costs. The results of the calculation of the FTA utilization costs using the Annual data are presented in the panel "Annual: Average" in Table 4. In this table we report the number of sample products, the average, standard deviation, median, and maximum values of the calculated costs. There are four noteworthy points. First, the average values were unstable over time in the case of China while the corresponding values rose in the case of Korea. In 2011, the mean value of the cost of using FTA was 671 thousand THB (around 22 thousand US dollars) in China, and 360 thousand THB (around 12 thousand US dollars) in Korea. Second, the median value decreased in the case of China while it did not change much in the case of Korea. In 2011, the median value of the cost of using FTA was 54 thousand THB (around two thousand US dollars) in China, and 30 thousand THB (around one thousand US dollars) in Korea. Third, the average values were much larger than the median values, indicating that the upper range of the calculated values was significantly larger. Fourth, the utilization costs are substantially lower in the case of Korea than China.

Table 4: Costs for FTA Utilization (THB)

		N	Mean	S.D.	Median	Max
Annual: Average						
From China	2007	1,631	710,767	3,006,593	96,755	76,432,312
	2008	1,603	535,595	2,916,685	74,795	69,864,600
	2009	3,491	445,356	2,685,181	59,053	104,703,112
	2010	4,423	510,195	2,786,689	57,363	86,636,016
	2011	4,456	671,263	4,889,575	54,384	162,310,880
From Korea	2010	2,626	319,167	2,873,720	30,004	126,850,792
	2011	2,667	360,516	2,504,515	29,964	81,251,600
Daily: Average						
From China	2007	1,631	178,402	651,723	50,399	12,650,138
	2008	1,603	161,122	1,079,148	36,096	30,307,076
	2009	3,491	141,022	993,172	26,829	32,026,924
	2010	4,423	116,489	680,423	26,467	29,772,672
	2011	4,456	170,496	2,359,053	27,373	150,129,968
From Korea	2010	2,626	88,087	699,714	15,924	29,522,382
	2011	2,667	106,326	847,772	15,663	37,956,904
Annual: Maximum under MFN						
From China	2007	1,631	956,691	3,564,357	124,094	76,432,312
	2008	1,603	800,647	3,910,272	102,590	93,720,904
	2009	3,491	705,757	3,993,753	80,551	133,982,128
	2010	4,423	834,888	4,245,509	84,308	160,963,440
	2011	4,456	1,020,716	6,112,144	81,680	162,310,880
From Korea	2010	2,626	372,353	2,971,118	29,482	126,850,792
	2011	2,667	460,775	4,059,910	25,935	162,438,304
Annual: Minimum under FTA						
From China	2007	1,631	464,844	2,819,143	24,639	76,432,312
	2008	1,603	270,543	2,591,387	4,851	69,864,600
	2009	3,491	184,955	2,149,087	2,661	104,703,112
	2010	4,423	185,501	2,221,297	1,900	86,636,016
	2011	4,456	321,810	4,491,667	1,870	162,310,880
From Korea	2010	2,626	265,980	2,863,580	19,077	126,850,792
	2011	2,667	260,257	1,651,252	17,496	41,940,128

Source: Authors' calculation.

As mentioned in the introductory section, the previous studies estimated the preferential tariff scheme utilization costs at around three to four thousand US dollars. Thus, our estimates on the median values are similar to those in the previous studies. In 2011, as mentioned above, those are around two thousand US dollars for exporting from China and one thousand US dollars for exporting from Korea. These amounts are much higher than the CoO fees reported in Table 1. It should be reminded that there is no charge in the case of Korea. Thus, we can say that most of the FTA utilization costs

consist of not CoO fees but mainly the cost of preparing the documents as mentioned in the introductory section. In other words, the example of these costs includes the expenses for the labor to handle the documentation work. Also, one simple interpretation on the low utilization cost in Korea is that the various kinds of public support for the firms' FTA utilization in Korea reduce the FTA utilization cost (see, for example, Cheong, 2014). In addition, one should note again that the mean values of the calculated utilization costs are much larger than the median values.[13]

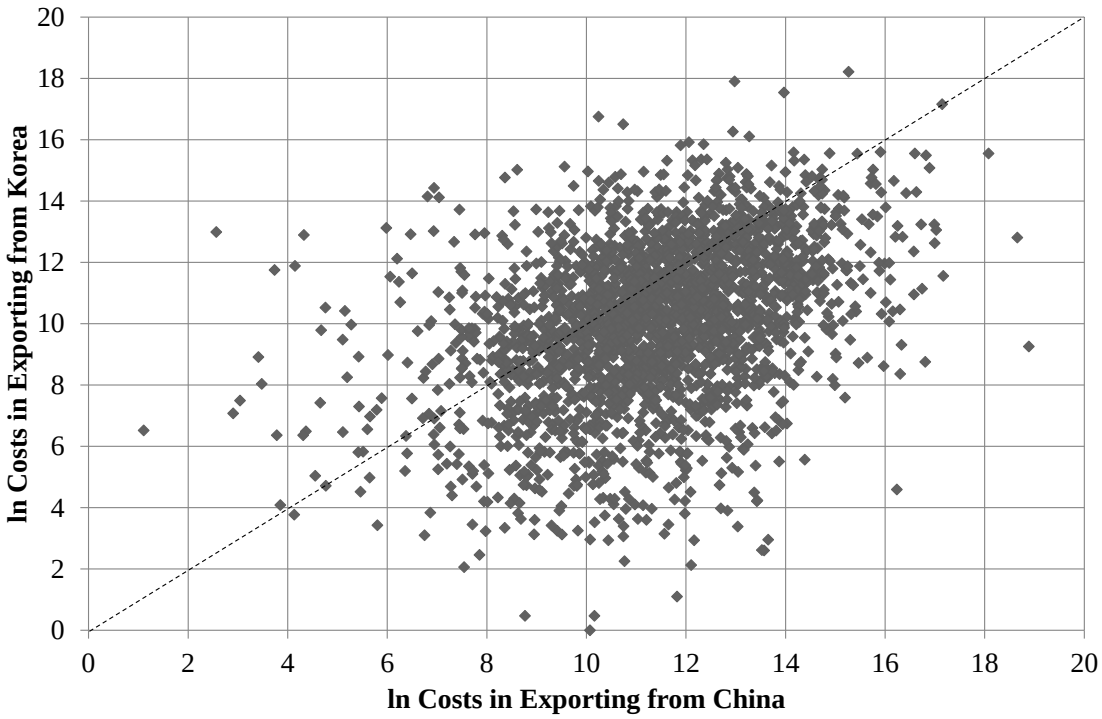
We also compute FTA utilization costs in different ways. In the panel "Daily: Average" in Table 4, we use the Daily data. We observe more or less similar patterns for FTA utilization costs for China and Korea to that found using the Annual data, although the absolute values using the two datasets are naturally different. The panels "Maximum under MFN" and "Minimum under FTA" report the utilization costs in the case of using the maximum value of tariff saving evaluated for imports under MFN schemes (Maximum under MFN) and the minimum value of tariff saving evaluated for imports under FTA schemes (Minimum under FTA) when calculating the utilization costs for partial utilization. These values are calculated using the Annual data. The results show a similar trend to that in column "Annual". However, the absolute values differ by method. Roughly speaking, compared with the costs in column "Annual", these are larger in the case of "Daily", smaller in the case of "Minimum under FTA", and larger in the case of "Maximum under MFN". In particular, the median values in the case of China in column "Minimum under FTA" are extremely low, less than two thousand THB (sixty one US dollars).

Next, we examine the product (HS 8-digit) level relationship between the costs for exporting from Korea and China, which is depicted in Figure 1. In this figure, we restrict products only to those for which FTA utilization costs can be calculated for both Korea and China. The utilization costs presented in "Annual: Average" in 2011 in Table 4 are used for drawing this figure. From this figure, we can see a positive relationship, implying that products with higher costs in China also have the same higher costs in Korea. However, since for some products there is a huge gap in the utilization costs between exporting from China and Korea, the magnitude of FTA

[13] The utilization costs in the case of the Japan-Thailand Economic Partnership are also available in Table A4 in the Appendix.

utilization costs across products cannot be explained perfectly by the product characteristics. As examined later, for example, the RoO, which differ by not only products but also FTAs, may be one kind of such determinants.

Figure 1: FTA Utilization Costs in 2011: China versus Korea (Annual, Average)



Source: Authors' calculation.

We further check the performance of our measures on FTA utilization costs. First, the upper panel in Table 5 reports the costs calculated based on the Annual data in 2011, according to the relevant FTA utilization status (i.e., full utilization, no utilization, and partial utilization). As explained in Section 2, our method of calculation differs significantly according to that status. Thus, such a difference may yield significant differences in the calculated costs. The panel shows that, in the median, FTA utilization costs are much higher in "partial" for both China and Korea. Indeed, the way of calculation will be better in the case of partial utilization since the range of utilization costs does not include zero or infinity in the case of partial utilization as shown in Section 2. Thus, 2,361 US dollars (=76,483 THB) and 3,331 US dollars (=107,935 THB) might be more precise estimates of FTA utilization for exporting from China and Korea, respectively.

Table 5: Costs for FTA Utilization by Status or RoO (THB, Annual, Average, 2011)

		N	Mean	S.D.	Median	Max
FTA Utilization Status						
From China	Full	323	595,666	5,012,753	17,960	81,944,552
	No	888	1,157,183	9,295,512	17,194	162,310,880
	Partial	3,245	545,815	2,575,230	76,483	77,336,304
From Korea	Full	75	706,561	3,272,519	55,055	28,173,908
	No	1,866	229,830	1,442,644	14,163	41,363,828
	Partial	726	660,664	4,058,624	107,935	81,251,600
Rules of Origin						
From China	CTC	1	14,136	.	14,136	14,136
	CTC/RVC	106	1,175,052	3,793,654	110,151	27,367,272
	RVC	3,916	695,609	5,162,914	53,280	162,310,880
	RVC/SP	429	332,190	1,144,957	62,981	15,823,650
	WO	4	16,291	23,900	6,693	51,727
From Korea	CTC	2	26,110	18,356	26,110	39,090
	CTC&RVC	9	1,054,788	1,941,115	231,813	5,942,367
	CTC/RVC	2,570	359,262	2,539,148	30,001	81,251,600
	RVC	27	377,020	924,626	39,517	4,391,645
	WO	59	313,054	1,330,132	11,048	9,863,888

Source: Authors' calculation.

Second, we examine the differences in FTA utilization costs according to the RoO. We classify all the RoO into five broad types; CTC, CTC&RVC, CTC/RVC, RVC/SP, and WO. CTC, SP, and WO indicate change-in-tariff classification, specific process, and wholly-obtained, respectively. "/" and "&" indicate "or" and "and", respectively. "WO" is wholly-obtained rules.[14] RVC rules require exporters to report the prices of each input. Specifically, they need to submit invoices and/or contract documents for each input as attachments, incurring higher costs for collecting the required information. On the other hand, the utilization costs for WO rules will be relatively low because these require exporters to certify only all-or-nothing in production. As a result, we may expect that the utilization costs are higher in RVC-related rules and lower for WO rules. The lower panel in Table 5 reports the FTA utilization costs in

[14] The detailed list of the RoO in ACFTA and AKFTA is reported in Table A5 in the Appendix.

2011 according to RoO types. In this table, we use the costs based on the "Average" method and "Annual" data. We can see the relatively high costs in the case of RVC-related rules, though for exporting from China, those for the CTC/RVC rules are also high compared with the cases for RVC or RVC/SP. Also, in both cases of exporting from China and Korea, the utilization costs are estimated to be the lowest for WO rules.

Finally, Table 6 reports the FTA utilization costs in 2011 according to industry. We again use the costs based on the "Average" method and "Annual" data. For the median for China and Korea the utilization costs seem relatively low for live animals, vegetable products, and wood products, but transport equipment has relatively high utilization costs. The low costs for live animals might be because most of these costs are subject to WO rules, particularly in the case of AKFTA, that mean exporters incur relatively low utilization costs as found in Table 5. On the other hand, the reason for the high cost of transport equipment might be because it is necessary to input a relatively large number of parts and components in this industry and thus it costs much more to collect the required information to certify the RoO.

Table 6: Distribution of FTA Utilization Costs in 2011 by Industry (THB)

	China					Korea				
	N	Mean	S.D.	Median	Max	N	Mean	S.D.	Median	Max
Live animals	90	160,371	292,991	40,068	1,868,129	25	92,269	234,420	6,367	996,006
Vegetable products	195	540,092	2,551,445	29,060	24,165,620	35	182,581	497,344	19,721	2,364,208
Animal/vegetable fats and oils	25	386,201	1,271,788	27,785	6,401,484	14	201,237	212,711	137,728	564,203
Food products	172	1,152,515	6,794,640	91,898	81,944,552	114	468,257	1,879,137	34,911	18,787,946
Mineral products	55	306,542	1,319,878	31,550	9,758,105	35	1,453,245	6,469,703	20,475	37,956,904
Chemical products	429	494,397	1,742,060	51,340	24,114,296	254	599,086	2,131,039	55,902	23,667,252
Plastics and rubber	238	343,169	1,099,235	87,096	10,926,229	189	546,298	3,087,403	78,180	41,363,828
Leather products	53	1,766,260	5,144,865	152,468	27,367,272	16	235,666	572,488	15,321	2,214,678
Wood products	83	765,654	2,823,528	35,349	18,800,160	26	12,025	17,890	2,856	65,556
Paper products	111	2,012,134	15,139,872	209,441	159,746,016	68	219,307	558,421	32,276	3,325,826
Textiles	817	231,057	867,790	41,225	15,823,650	420	106,849	535,109	16,091	9,863,888
Footwear	41	640,213	1,498,852	114,570	8,026,429	34	37,625	58,348	11,457	222,942
Plastic or glass products	116	244,850	570,472	54,461	4,175,967	86	235,272	1,115,535	16,921	10,290,785
Precision metals	20	797,304	1,659,628	113,362	6,955,629	9	272,086	551,147	15,972	1,705,646
Base Metal	396	797,392	4,515,113	90,448	77,336,304	254	447,472	2,013,642	68,271	28,173,908
Machinery	1,050	549,190	2,841,446	45,859	71,132,304	724	197,692	589,807	26,706	7,372,020
Transport equipment	144	4,147,102	18,270,330	116,722	162,310,880	60	3,253,856	12,832,411	82,317	81,251,600
Precision machinery	224	515,015	1,806,088	50,640	21,725,920	164	136,861	465,484	19,564	3,851,293
Others	197	548,415	1,187,270	107,355	9,042,446	140	200,159	445,567	31,111	2,853,206

Source: Authors' calculation.

5. Concluding Remarks

In this paper, we have measured the cost of FTA utilization for exporting from China and Korea to Thailand. To do that, we employed shipment level Customs data for Thai imports, which enabled us to identify not only the importing firm, source country, and commodity, but also tariff scheme used for such imports. We proposed several measures as a proxy for the FTA utilization costs, including the minimum amount of firm level saving of tariff payments. The median costs for FTA utilization are estimated to be around two thousand US dollars in the case of exporting from China and around one thousand US dollars in the case of exporting from Korea. However, among products with partial FTA utilization, the median of those costs turns out to be around three thousand for exporting from Korea. Nevertheless, our estimates are a little lower than those in previous studies, which showed around three to four thousand US dollars of preference utilization costs in Bangladesh and Chile. Finally, we also found that FTA utilization costs differ by RoO and industry.

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Appendix A. Other Tables

Table A1: FTAs by Thailand

FTAs	Members	Implementation
ASEAN Free Trade Area (AFTA)	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	1993
Thailand-India FTA (TIFTA): Early harvest	India and Thailand	2004
Thailand-Australia FTA (TAFTA)	Australia and Thailand	2005
ASEAN-China FTA (ACFTA)	Brunei, Cambodia, China Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	2005
Thailand-New Zealand Closer Economic Partnership Agreement (TNZCEP)	New Zealand and Thailand	2005
Japan-Thailand Economic Partnership Agreement (JTEPA)	Japan and Thailand	2007
ASEAN-Japan Economic Partnership Agreement (AJCEP)	Brunei, Cambodia, Indonesia, Japan, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	2009
ASEAN-Republic of Korea FTA (AKFTA)	Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Korea, Singapore, Viet Nam, and Thailand	2010
ASEAN-Australia-New Zealand FTA (AANZFTA)	Australia, Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, New Zealand, Philippines, Singapore, Viet Nam, and Thailand	2010
ASEAN-India FTA (AIFTA)	Brunei, Cambodia, India, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Viet Nam, and Thailand	2010
Thailand-Peru Closer Economic Partnership Agreement (TPCEP)	Peru and Thailand	2012

Source: Legal texts of FTAs.

Table A2: FTA Utilization Status: Number of Products

	Eligible Products	No Imports	Utilization		
			No	Partial	Full
From China					
2007	2,415	784	1,016	606	9
2008	2,415	812	542	993	68
2009	4,897	1,406	1,107	2,219	165
2010	5,893	1,470	901	3,222	300
2011	5,893	1,437	888	3,245	323
From Korea					
2010	5,773	3,147	1,945	624	57
2011	5,773	3,106	1,866	726	75

Source: Customs Department, Kingdom of Thailand.

Table A3: Tariff Margin (%)

	N	Min	Median	Mean	Max
China (ACFTA)					
2007	2,415	0.1	18	16	199
2008	2,415	0.2	18	16	217
2009	4,897	0.0	5	12	264
2010	5,893	0.0	5	13	266
2011	5,893	0.0	5	13	266
Korea (AKFTA)					
2010	5773	0.0	7	12	266
2011	5773	0.0	5	12	266

Source: Customs Department, Kingdom of Thailand.

Table A4: Distribution of FTA Utilization Costs for Japan (THB): JTEPA

	N	Mean	S.D.	Median	Max
Baseline					
2007	3,385	1,689,721	29,259,485	26,688	1,369,231,232
2008	3,470	887,898	11,574,483	40,238	587,914,112
2009	3,641	1,058,307	18,431,162	43,054	997,600,768
2010	3,823	1,210,385	14,262,436	57,490	745,529,280
2011	3,831	1,297,830	12,533,977	63,488	580,086,656
Daility Data Basis					
2007	3,385	202,716	2,806,511	13,453	105,596,808
2008	3,470	124,244	542,923	18,799	14,742,154
2009	3,641	137,287	897,402	18,224	31,561,254
2010	3,823	142,863	817,698	22,665	38,523,924
2011	3,831	190,205	1,605,675	26,159	81,823,192
Using Maximum under MFN					
2007	3,385	2,216,409	46,490,393	26,688	2,414,225,664
2008	3,470	1,082,108	11,517,825	42,123	528,184,896
2009	3,641	878,078	6,665,605	43,922	274,186,176
2010	3,823	1,391,114	11,323,421	59,139	428,005,792
2011	3,831	1,668,138	14,708,228	66,109	587,289,472
Using Minimum under FTA					
2007	3,385	1,163,034	16,770,949	24,158	619,040,704
2008	3,470	693,688	15,202,548	24,011	873,356,672
2009	3,641	1,238,537	35,630,970	22,345	1,987,029,376
2010	3,823	1,029,655	24,765,300	25,591	1,454,387,712
2011	3,831	927,521	18,043,751	27,296	1,068,667,392

Source: Authors' calculation.

Table A5: Distribution of RoOs in ACFTA and AKFTA

	ACFTA						AKFTA				
	CTC	CTC/RVC	RVC	RVC/SP	WO		CTC	CTC&RVC	CTC/RVC	RVC	WO
Live animals			314							22	258
Vegetable products			346				1		24	17	335
Animal/vegetable fats and oils			116		16			13	121	16	
Food products	1	21	313				2	3	294	53	
Mineral products			116						128		
Chemical products			571						570		
Plastics and rubber		43	228					4	275		
Leather products		47	27				1		37		
Wood products			134						134		
Paper products			133						140		
Textiles			445	461	6				886		5
Footwear		15	27						62		
Plastic or glass products			130						148		
Precision metals			22						17		
Base Metal		5	439				1		360		
Machinery			1,158						1,150		
Transport equipment			279						156	45	
Precision machinery			257						257		
Others			223						234	4	
Total	1	131	5,278	461	22	0	5	20	4,993	157	598

Source: Legal texts of ACFTA and AKFTA.

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