FTA in International Finance: Impacts of Exchange Rates on FTA Utilization

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1. FTA Utilization and FTA Agreement

- FTA agreement means occurrence of right to utilize FTA tariff rates.

- It does not necessarily mean utilization of FTA tariff rates.

  ➢ Not all exporters can utilize the FTA tariff scheme.

  ➢ Contradicts to the typical assumption in theory.

Liberalization Level in ASEAN+1 FTAs

Table. Share of Products with Finally Zero Rates at HS 6-digit Level

	AANZFTA	ACFTA	AIFTA	AJCEP	AKFTA	Average
Brunei	99.2%	98.3%	85.3%	97.7%	99.2%	95.9%
Cambodia	89.1%	89.9%	88.4%	85.7%	97.1%	90.0%
Indonesia	93.7%	92.3%	48.7%	91.2%	91.2%	83.4%
Lao, PDR	91.9%	97.6%	80.1%	86.9%	90.0%	89.3%
Malaysia	97.4%	93.4%	79.8%	94.1%	95.5%	92.0%
Myanmar	88.1%	94.5%	76.6%	85.2%	92.2%	87.3%
Philippines	95.1%	93.0%	80.9%	97.4%	99.0%	93.1%
Singapore	100%	100%	100%	100%	100%	100%
Thailand	98.9%	93.5%	78.1%	96.8%	95.6%	92.6%
Viet Nam	94.8%	n.a.	79.5%	94.4%	89.4%	89.5%
Australia	100%					
China		94.1%				
India			78.8%			
Japan				91.9%		
Korea					90.5%	
New Zealand	100%					
Average	95.7%	94.7%	79.6%	92.8%	94.5%	

Notes: Data on Vietnam under the ASEAN-China are missing. Data on Myanmar under the ASEAN-China FTA are also missing for HS01-HS08.
Source: ERIA Policy Brief, No. 2012-03, May 2012

FTA Utilization in Thai Import
(2011, Billion THB)

	Total (A)	Eligible (B)	FTA (C)	Others (D)	(I) (C)/(A)	(II) (C)/(B)	(III) (D)/(A)
AANZFTA	242	41	0.3	87	0.1%	0.7%	36%
TAFTA	242	48	22	87	9%	45%	36%
ACFTA	930	460	185	313	20%	40%	34%
AIFTA	92	26	3	27	3%	10%	29%
TIFTA	92	5	0.7	27	1%	13%	29%
AJCEP	1,288	439	1.6	563	0.1%	0.4%	44%
JTEPA	1,288	648	136	563	11%	21%	44%
AKFTA	281	135	30	109	11%	22%	39%

Source: Hayakawa, Laksanapanyakul, and Shiino (2013), originally from Thai Customs; World Trade Atlas

Notes: "AANZFTA" includes figures for only Australia. "Total", "Eligible", and "FTA" refer to total imports, imports in products with the lower preferential rates than MFN rates, and imports under FTA schemes, respectively. "Others" includes imports under the schemes of bonded warehouses, free zone, investment promotion, duty drawback under Section 19 bis, and duty drawback for re-export.

Why does the gap occur?

- Two possibilities:

   1. Fixed costs for FTA utilization

   2. Compliance with Rules of Origins (RoOs)

- Rules of Origins (RoOs)

   ➢ Export products have to be produced (i.e. originated) in FTA member countries.

2. Fixed Costs for FTA Utilization

Exporter

> 1st Step: Check availability of FTA preferential rates

> 2nd Step: Check FTA preferential rates (< MFN rates?)

> 3rd Step: Check Rules of Origins (RoOs)

> 4th Step: Obtaining Certificates of Origins (CoOs)

Importer

> 5th Step: Submitting CoOs to Customs

Fixed Costs for FTA Utilization

- Export profits under FTA and MFN
  - $\pi^F = (P^X - P^I)d^F - C - C^F, \quad d^F = \frac{P^*}{P^{X*}}\bar{d}$
  - $\pi = (P^X - P^I)d - C, \quad d = \frac{P^*}{(1+\tau)P^{X*}}\bar{d}$
- Profit gap
  - $g \equiv \pi^F - \pi = (P^X - P^I)\frac{\tau}{1+\tau}\frac{P^*}{P^{X*}}\bar{d} - C^F$
  - $g > 0$: FTA is preferred.
  - $g < 0$: MFN is preferred.

Effects of Exchange Rates

- Exchange rate in exporting

  ➢ $\dfrac{\partial U_g(g)}{\partial \ln \epsilon^X} = u_g \{ P^I \eta^X + (P^X - P^I) \} \dfrac{\tau}{1+\tau} \dfrac{\epsilon^X P^*}{P^X} \bar{d} > 0$

  ➢ $\eta^X \equiv \dfrac{\partial \ln P^X}{\partial \ln \epsilon^X} \quad (1 \geq \eta^X \geq 0)$

- Exchange rate in importing

  ➢ $\dfrac{\partial U_g(g)}{\partial \ln \epsilon^I} = -u_g \left[1 - \dfrac{\partial \ln P^X}{\partial \ln P^I} \right] P^I \eta^I \dfrac{\tau}{1+\tau} \dfrac{P^*}{P^{X*}} \bar{d} < 0$

  ➢ $\eta^I \equiv \dfrac{\partial \ln P^I}{\partial \ln \epsilon^I} \quad (1 \geq \eta^I \geq 0)$

3. Rules of Origins

- Regional Value Content (RVC Rule)
  - ➤ 30% Rule, 40% Rule, 50% Rule, etc.
- Change in Tariff Classification (CTC rule)
  - ➤ Change in Chapter (CC, i.e. HS 2-digit level)
  - ➤ Change in Heading (CH, i.e. HS 4-digit level)
  - ➤ Change in Subheading (CS, i.e. HS 6-digit level)
- Technical Requirement/Specific Process (TECH) Rule
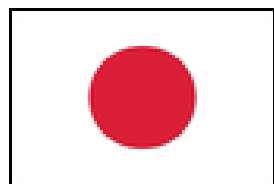- Wholly-Obtained (WO) Rule

RVC Rule (40%)

1200 THB

1200 THB

3000 THB

20% THB Value-added
$= (3000-1200-1200)/3000$
$= 20\%$
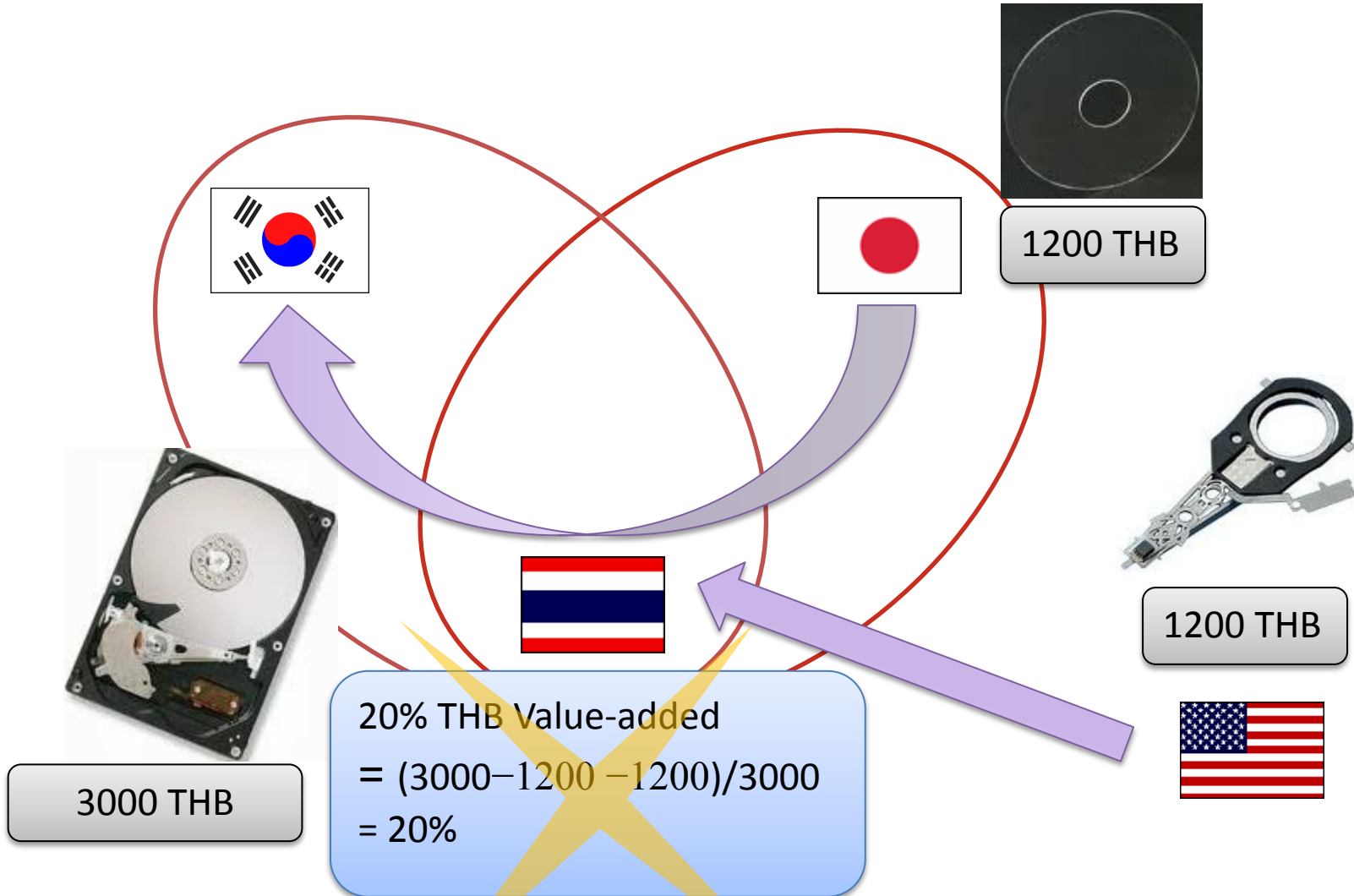
Distribution of RoOs

	Number	Share (%)
CC	5	0.1
CH	12	0.2
CC/RVC	514	10
CH/RVC	3,907	77
CH/RVC/TECH	21	0.4
CS/RVC	66	1
RVC/WO	6	0.1
CC&RVC	2	0.04
CH&RVC	4	0.1
RVC	61	1
WO	454	9
Total	5,052	100

- Nearly 90% of utilized RoOs are related to RVC and CTC rules.

Value-added Ratio

FTA Utilization Rate

Intermediate Goods: P^I

Final Goods: P^x
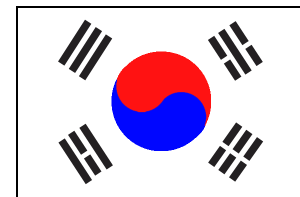
Build-down method: $R^D = \dfrac{P^x - P^I}{P^x} = 1 - n$

Build-up method: $R^U = \dfrac{P^I}{P^x} = n$

etc…

Effects of Exchange Rates

- Exchange rate in exporting

$$\frac{\partial U_n(n)}{\partial \ln \epsilon^X} = u_n \frac{P^I}{P^X} \eta^X > 0$$

- Exchange rate in importing

$$\frac{\partial U_n(n)}{\partial \ln \epsilon^I} = -u_n \frac{P^I}{P^X}\left[1 - \frac{\partial \ln P^X}{\partial \ln P^I}\right] \eta^I < 0$$

- In sum... $(U \equiv U_g(g) + U_n(n))$

$$\frac{\partial U}{\partial \ln \epsilon^X} > 0 \quad \text{and} \quad \frac{\partial U}{\partial \ln \epsilon^I} < 0$$

4. Testable Hypotheses and Empirical Results

- **Testable Hypothesis 1**

  ➢ $\dfrac{\partial U}{\partial \ln \epsilon^X} > 0$

  ➢ *Depreciation (appreciation) of final-good exporters' currencies against a currency in the export destination country (i.e., Korean won) enhances (lowers) the firm-level likelihood of FTA utilization.*

Testable Hypotheses

- **Testable Hypothesis 2**
  - $$\frac{\partial U}{\partial \ln \epsilon^I} < 0$$
  - *Depreciation (appreciation) of final-good exporters' currencies against currencies of intermediate-good producers in FTA non-member countries lowers (enhances) the firm-level likelihood of FTA utilization.*

Empirical Framework

- Utilization$_{ict}$ =
$\zeta_1 \ln \text{Exchange}_{ct}^{X} + \zeta_2 \ln \text{Exchange}_{ct}^{I} + \alpha \text{Margin}_{ict} + \gamma \ln \text{Monthly Trade}_{ict} + \delta \ln \text{Per Capita GDP}_{ct} + u_c + u_i + u_t + \varepsilon_{ict}.$

  - ➢ ζ_1: Positive

  - ➢ ζ_2: Positive

  - ➢ α: Positive ($\text{Margin}_{ict} \equiv \tau - \tau^{F}$)

  - ➢ γ: Positive

  - ➢ δ: Positive

Dependent Variable

- Utilization rate of AKFTA ($Util_{ict}$)
  - FTA utilization in imports of Korean companies from ASEAN countries
  - Korea's tariff level (HS9 product level)
  - Annual data from 2007 to 2011. Number of observation is 42,190.
  - Singapore is omitted because it concludes bilateral FTA with Korea.
  - Utilization dummy for robustness check

Independent Variables

- ER in Exporting (EX_{ct}^K)

  ➢ASEAN currency / KRW

  ➢EX_{ct}^K ↑: Depreciation of each ASEAN currency against KRW.

- ER in Importing (EX_{ct}^I)

  ➢$EX_{ct}^I \equiv \sum_{n=1}^{N} W_c^n EX_{ct}^n, \quad \sum_{n=1}^{N} W_c^n = 1.$

  ➢EX_{ct}^I ↑: Depreciation of each ASEAN currency against import currencies.

Baseline Results

Sample	ALL (I)	ALL (II)	Restricted (III)
ln Exchange rates in exporting		0.2033***	0.1176*
		[0.0616]	[0.0688]
ln Exchange rates in importing		0.0004	-0.0006
		[0.0013]	[0.0014]
Margin	0.0112***	0.0110***	0.0120***
	[0.0016]	[0.0016]	[0.0020]
ln Monthly Trade	0.0684***	0.0683***	0.0644***
	[0.0008]	[0.0008]	[0.0009]
ln GDP per capita	0.0106	0.1893***	0.0712
	[0.0311]	[0.0639]	[0.0720]
Number of observations	34,065	34,065	27,640
R-squared	0.5828	0.5830	0.5714

Robustness Check

Estimation	IV	IV	LPM	LPM
Sample	ALL	Restricted	ALL	Restricted
	(I)	(II)	(III)	(IV)
2nd Stage				
ln Exchange rates in exporting	0.2116***	0.119*	0.1758**	0.1447*
	[0.0569]	[0.0632]	[0.0710]	[0.0804]
ln Exchange rates in importing	0.0002	-0.0006	0.0001	0.0011
	[0.0012]	[0.0013]	[0.0015]	[0.0016]
Margin	0.0111***	0.0118***	0.0096***	0.0078***
	[0.0014]	[0.0018]	[0.0019]	[0.0024]
ln Monthly Trade	0.0605***	0.0565***	0.0858***	0.0818***
	[0.0013]	[0.0014]	[0.0009]	[0.0010]
ln GDP per capita	0.1952***	0.0697	0.1663**	0.0995
	[0.0590]	[0.0661]	[0.0724]	[0.0827]

Effects of Exchange Rates

- Hypothesis 1: Accepted

- Hypothesis 2: Rejected

- These results are supported when PTM prevails.

➢ When $\eta^X = \dfrac{\partial \ln P^X}{\partial \ln \epsilon^X} = 1,$ $\quad \dfrac{\partial U}{\partial \ln \epsilon^X} > 0.$

➢ When $\eta^I = \dfrac{\partial \ln P^I}{\partial \ln \epsilon^I} = 0,$ $\quad \dfrac{\partial U}{\partial \ln \epsilon^I} = 0.$

5. Product Differentiation

- Ito, Koibuchi, Sato and Shimizu (2012)
  - *"Japanese firms that export highly differentiated products or have a dominant share in the global market tend to invoice their exporting products in the yen both to advanced countries and to developing countries."*

Product Differentiation

- Product differentiation -> ERPT
  - When X are differentiated less, $\eta^X \to 1$.
  - When I are differentiated less, $\eta^I \to 0$.

- ERPT -> Impacts of exchange rates
  - When $\eta^X \to 1$, $\dfrac{\partial U}{\partial \ln \epsilon^X}$ becomes larger.
  - When $\eta^I \to 0$, $\dfrac{\partial U}{\partial \ln \epsilon^I} \to 0$.

Product Differentiation

- **<u>Testable Hypothesis 3</u>**

$$\succ \frac{\partial}{\partial Less\ Diff^X} \left(\frac{\partial U}{\partial \ln \epsilon^X} \right) > 0$$

- *If export products from ASEAN to Korea are less differentiated, the effect of exchange rates on the firm-level likelihood of FTA utilization is more likely to become positive.*

Product Differentiation

- **Testable Hypothesis 4**
  - $\dfrac{\partial}{\partial Less\ Diff^I}\left(\dfrac{\partial U}{\partial \ln \epsilon^I}\right) > 0$

- *If non-originating inputs that are imported by ASEAN final-good producers from AKFTA non-member countries are less differentiated, the effect of exchange rates in importing on the firm-level likelihood of FTA utilization is less likely to become negative.*

Empirical Framework

- Utilization$_{ict} =$
  $\zeta_1 \ln \text{Exchange}_{ct}^X + \Theta_1 \text{ExElasticity}_i \ln \text{Exchange}_{ct}^X +$
  $\zeta_2 \ln \text{Exchange}_{ct}^I + \Theta_2 \text{ImElasticity}_i \ln \text{Exchange}_{ct}^I +$
  $\alpha \text{Margin}_{ict} + \gamma \ln \text{Monthly Trade}_{ict} +$
  $\delta \ln \text{Per Capita GDP}_{ct} + u_c + u_i + u_t + \varepsilon_{ict}.$

  - ➢ Θ_1: Positive

  - ➢ Θ_2: Positive

Demand elasticity of exports and imports (Elasticity of substitution, or degrees of product similarity)

- We use the estimation result of Broda and Weinstein (2006)

  ➢Product level elasticity

- Export elasticity ($ExEl_i$)

  ➢Korean elasticity of demand on imported products

- Import elasticity ($ImEl_i$)

  ➢We cannot identify what products are imported as *intermediate goods*.

  ➢We construct $ImEl_i$ by weighted aggregation.

Empirical Results

Estimation Sample	OLS ALL (I)	IV ALL (II)	OLS Restricted (III)	IV Restricted (IV)	LPM ALL (V)	LPM Restricted (VI)
2nd Stage						
ln Exchange rates in exporting	0.2041***	0.0604***	0.1198*	0.1213*	0.1769**	0.1478*
	[0.0616]	[0.0013]	[0.0689]	[0.0632]	[0.0710]	[0.0804]
* ExElasticity	0.0001**	0.2124***	0.0001**	0.0001**	0.0001**	0.0001**
	[0.0000]	[0.0569]	[0.0000]	[0.0000]	[0.0001]	[0.0001]
ln Exchange rates in importing	-0.0011	0.0001**	-0.0015	-0.0015	-0.0011	0.0002
	[0.0014]	[0.0000]	[0.0015]	[0.0014]	[0.0016]	[0.0018]
* ImElasticity	0.0005***	-0.0015	0.0002	0.0002	0.0006***	0.0002
	[0.0002]	[0.0013]	[0.0002]	[0.0002]	[0.0002]	[0.0002]
Margin	0.0111***	0.0005***	0.0120***	0.0119***	0.0097***	0.0079***
	[0.0016]	[0.0001]	[0.0020]	[0.0018]	[0.0019]	[0.0024]
ln Monthly Trade	0.0683***	0.0112***	0.0644***	0.0566***	0.0858***	0.0819***
	[0.0008]	[0.0014]	[0.0009]	[0.0014]	[0.0009]	[0.0010]
ln GDP per capita	0.1904***	0.1963***	0.0735	0.0717	0.1677**	0.1025
	[0.0639]	[0.0590]	[0.0721]	[0.0661]	[0.0724]	[0.0827]

Empirical Results (USD ER)

Estimation	OLS	IV	OLS	IV	LPM	LPM
Sample	ALL	ALL	Restricted	Restricted	ALL	Restricted
	(I)	(II)	(III)	(IV)	(V)	(VI)
2nd Stage						
ln Exchange (USD)	0.2054***	0.2126***	0.1157*	0.1170*	0.1807**	0.1528*
	[0.0614]	[0.0567]	[0.0687]	[0.0631]	[0.0707]	[0.0801]
* ExElasticity	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**	0.0001**
	[0.0000]	[0.0000]	[0.0000]	[0.0000]	[0.0001]	[0.0001]
* ImElasticity	0.0002**	0.0003***	-0.00001	-0.00003	0.0003***	-0.0002
	[0.0001]	[0.0001]	[0.0002]	[0.0002]	[0.0001]	[0.0002]
Margin	0.0111***	0.0112***	0.0120***	0.0119***	0.0097***	0.0079***
	[0.0016]	[0.0014]	[0.0020]	[0.0018]	[0.0019]	[0.0024]
ln Monthly Trade	0.0683***	0.0604***	0.0644***	0.0566***	0.0857***	0.0818***
	[0.0008]	[0.0013]	[0.0009]	[0.0014]	[0.0009]	[0.0010]
ln GDP per capita	0.1910***	0.1965***	0.0713	0.0695	0.1697**	0.1045
	[0.0639]	[0.0590]	[0.0721]	[0.0662]	[0.0724]	[0.0826]

6. Conclusion

- $\zeta_1 > 0$: Depreciation of exporters' (ASEAN countries') currencies against the destination currency (KRW) enhances FTA utilization.

  ➢ More exporters cover the fixed cost, or comply with RoOs.

- $\Theta_1 > 0$: If final goods are less differentiated, the impact of ER on FTA utilization becomes larger.

  ➢ If products are less differentiated, exporters (sellers) are more likely to accept larger exchange-rate risk.