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Tax Incentives, International Tax and FDI: Evidence from South-East Asia

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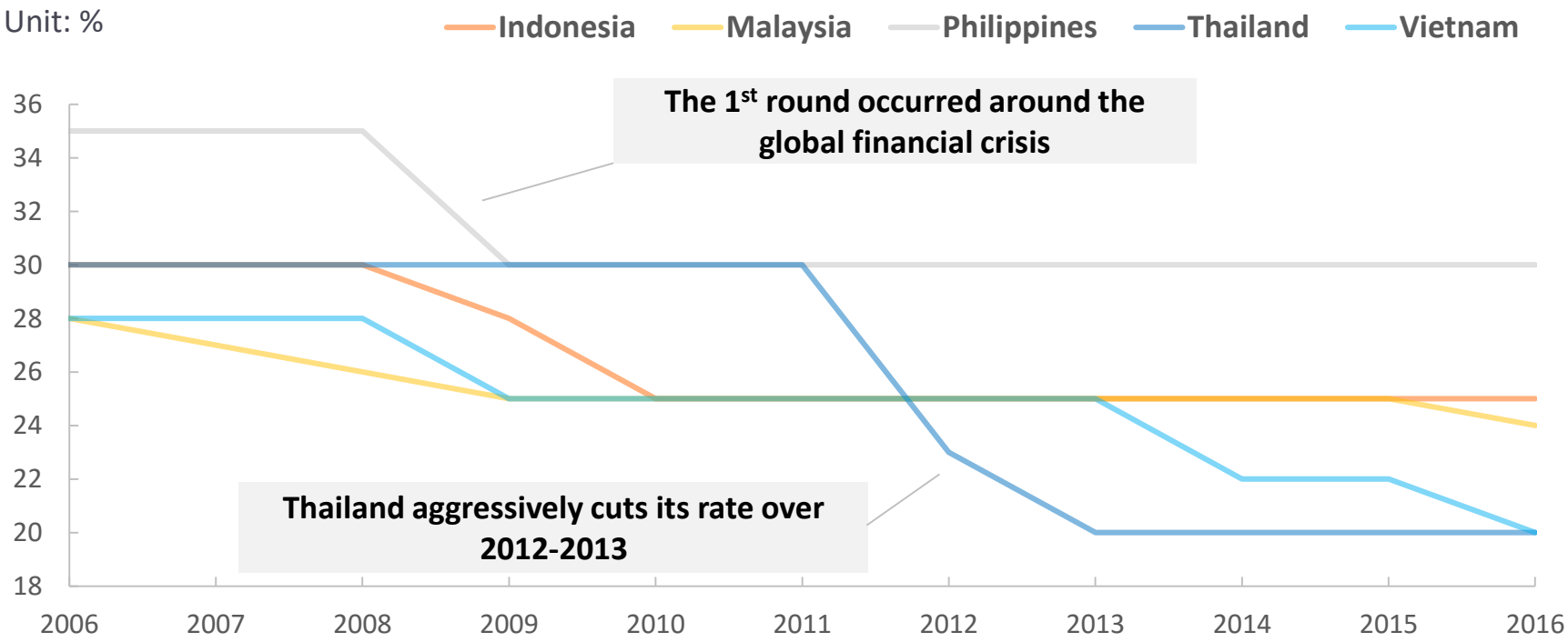
Athiphat Muthitacharoen, PhD
Chulalongkorn University
athiphat.m@chula.ac.th

The ASEAN tax development over the previous decade has been characterized by rounds of tax cuts

Statutory corporate income tax rates across ASEAN5 (2005-2016)



These tax incentives are costly and do not represent the whole picture—this makes it crucial that we understand their role on FDI location choice

Source: Author's estimates

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

This Paper

Research Question	Study Challenges	Empirical Strategy
To what extent, do taxes influence FDI in the South-East Asian countries?	▪ **Tax costs depend on domestic and international tax codes**	**Bilateral Effective Average Tax Rate** using Devereux and Griffith (2003)'s method
	▪ **Endogeneity of tax rates**: ▪ FDI activities could contemporaneously influence tax policy	**IV Panel-Gravity Model**
	▪ **Sample Selection** suggested by Helpman et al. (2008) ▪ FDI flows could take non-positive values	**Heckman IV Model**

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

Scope of the Paper

- Host countries = Top 5 ASEAN countries in term of net FDI inflows (excluding Singapore)
  - Indonesia, Malaysia, the Philippines, Thailand, and Vietnam
- Home countries = Top investors in term of the size of investment
  - Australia, Japan, Germany, Netherlands, Singapore, the UK and the US
  - This includes top 3 countries in all of the host countries
- Period = 2002-2014
  - Covering multiple tax cuts, switches to territorial taxation

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

Related Studies

1 Formulation of Forward-Looking Effective Tax Rates

- Auerbach (1979), King and Fullerton (1984)
- Devereux and Griffith (2003)

2 Evaluation of the impact of taxation on FDI location choices

- Devereux and Griffith (1998)
- Bellak and Leibrecht (2009)
- Egger et al. (2009)
- Klemm and Van Parys (2012)

- Most papers study developed countries—Relatively few papers focus on developing countries (None on ASEAN)

- With varying mix of location factors → The salience of tax burden could be different!

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

Presentation Outline

1. Introduction

2. Bilateral Effective Average Tax Rate

3. Empirical Strategy and Data

4. Findings

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

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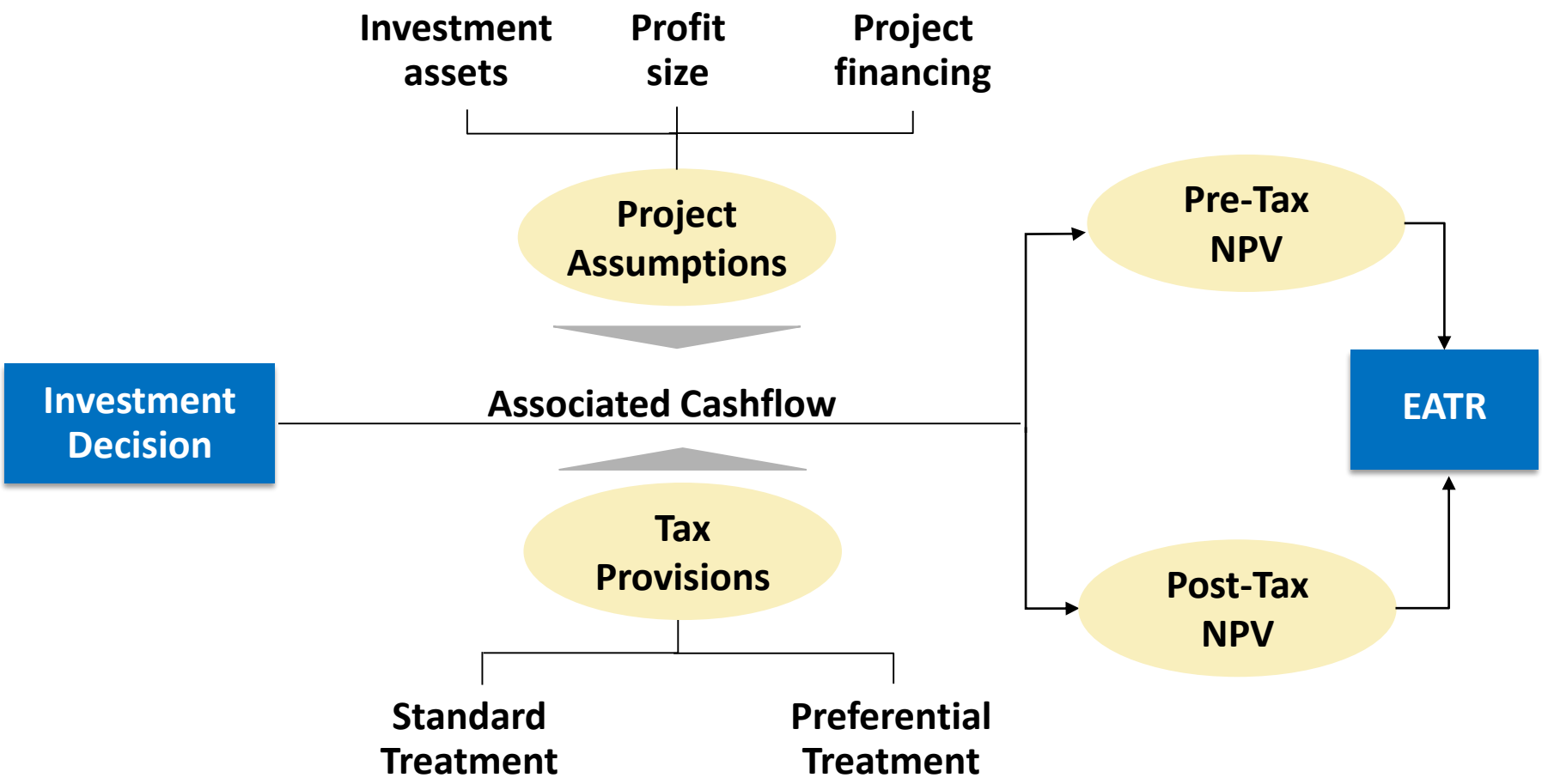
EATR Computation Framework along the lines of Devereux and Griffith (2003)

1 **Deciding to invest**

2 **Assessing the cashflow**

3 **Identifying the tax wedge**



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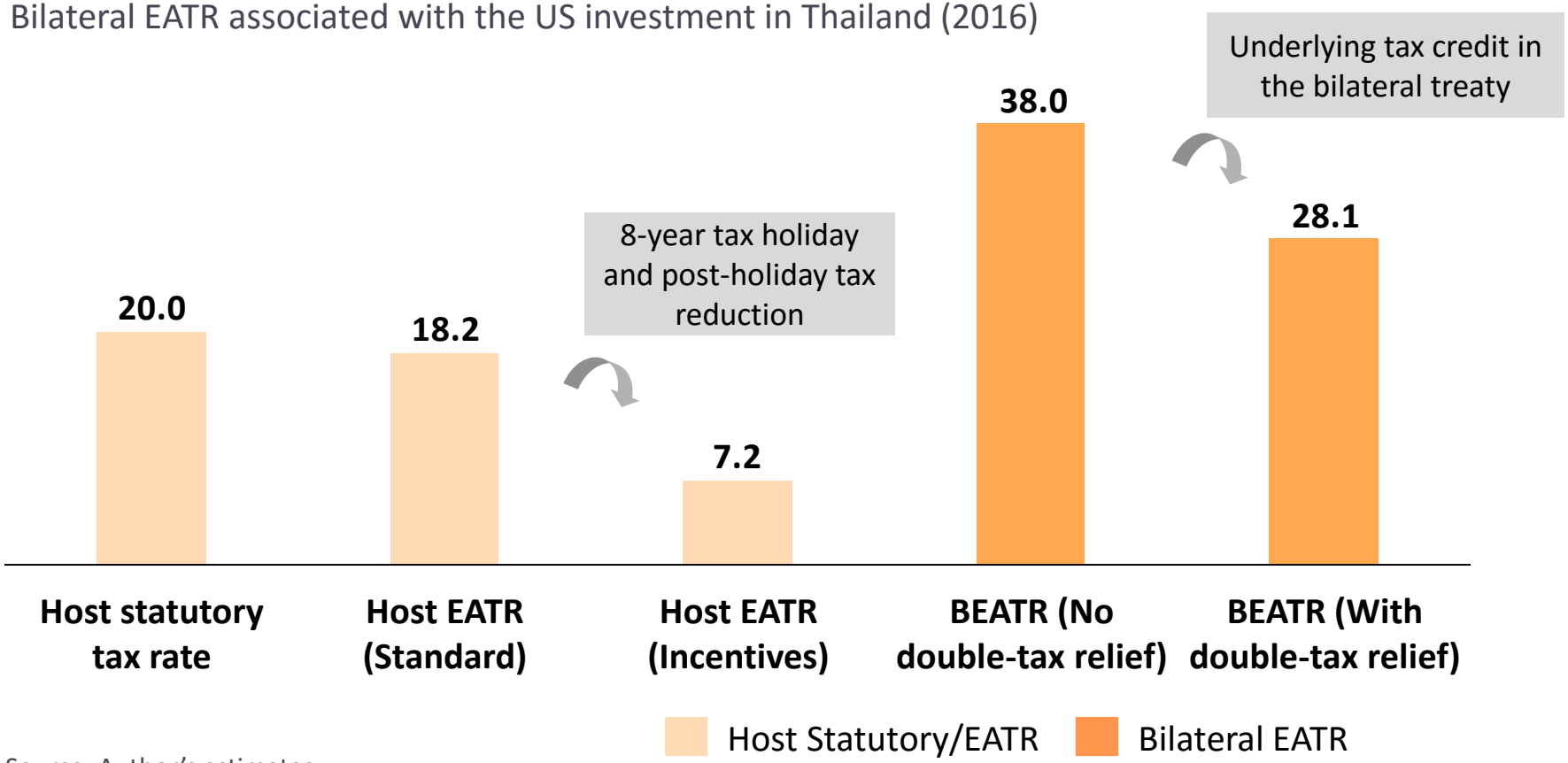
Host-country taxation alone does not give complete picture about the tax burden faced by investors

Example of how domestic and international tax provisions affect the effective tax rate (Thailand & US)

Bilateral EATR associated with the US investment in Thailand (2016)



Source: Author's estimates

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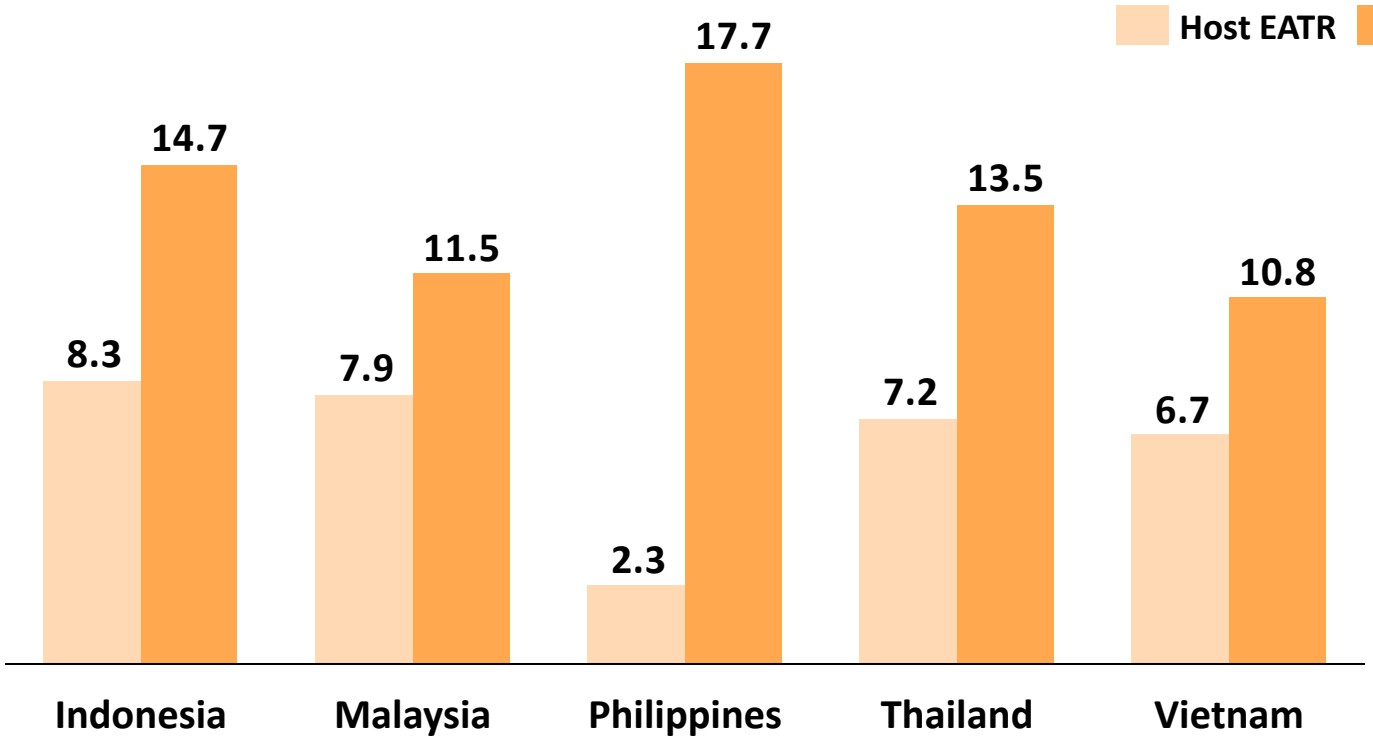
International taxation represents significant tax cost for investors

Tax wedge between domestic and international taxation

Host EATR vs. Average Bilateral EATR for ASEAN5 (2016)



Average tax wedge = 7.2%

Source: Author's estimates

Key features of tax laws incorporated in the computation

1 Host-Country Taxation

- Host statutory tax rate
- Depreciation deduction
- Tax holiday incentives
- Withholding tax on repatriated income

2 Home-Country Taxation

- Home statutory tax rate
- Treatment of foreign-sourced income (Worldwide or Territorial)
- Unilateral relief of double taxation

3 Bilateral Tax Treaties

- Double taxation relieving methods
  - Ordinary credit
  - Underlying credit
  - Tax sparing credit

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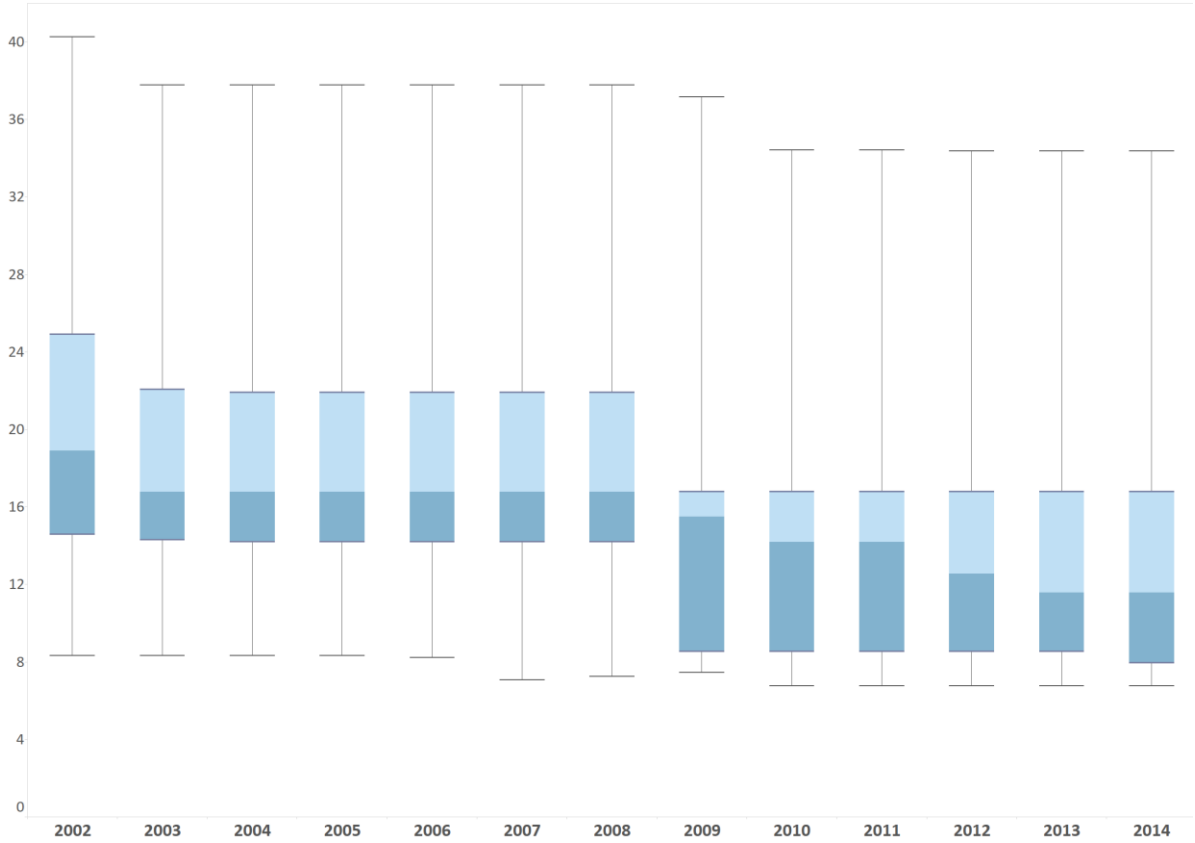
Variation of the Bilateral EATR

Distribution of the bilateral EATR across ASEAN5 (2002-2014)



Source of Variation

Overall S.D. = 8.20

- Between S.D. = 7.75
- Within S.D. = 2.79

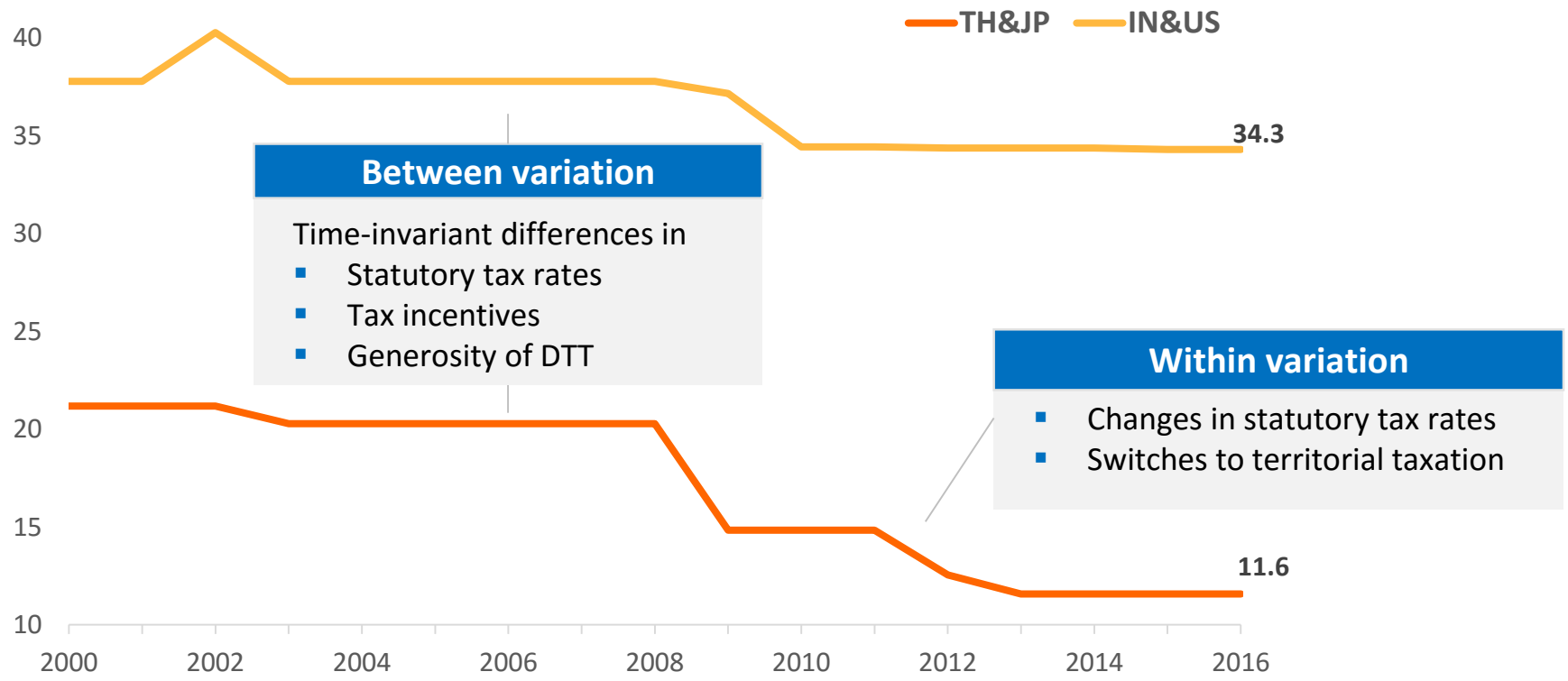
Note: Whiskers indicate maximum and minimum values. Boxes indicate upper quartile, median and lower quartile.

Source: Author's estimates

Examples of variation in the bilateral EATR

Bilateral EATR (Thailand & Japan, Indonesia & US)

Unit: %



Source: Author's estimates

Main Assumptions

Long-Term Investment—the capital stock is disinvested over time through depreciation

- 1) No capital income at the personal income tax level
- 2) Equity finance is adopted to finance the investment
- 3) A parent company in the home country undertakes investment through a fully owned foreign subsidiary in the source country
- 4) The subsidiary finances its investment using its retained earnings (so it reduces its dividend to the parent company by one unit)
- 5) The subsidiary's corresponding profits are immediately and fully repatriated to the parent company (this induces potential double taxation of profits).

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

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Basic Model Specification

- Two-stage least squares panel-gravity model to analyze the role of taxation as a determinant of FDI flows

$$\log FDI_{ijt} = \beta_1 beatr_{ijt} + \beta_2 x_{it} + \beta_3 x_{jt} + \beta_4 x_{ij} + \beta_5 x_{ijt} + \text{time FE} + \text{host FE} + \text{home FE} + e_{ijt}$$

  - where $\log FDI_{ijt}$ = log of real net FDI flow from parent country *i* to host country *j*

- **Endogeneity of tax rate** → Instrument = Lagged BEATR

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Addressing potential sample selection bias

- Helpman et al. (2008)
  - Dropping non-positive observations could potentially result in sample selection bias
  - Suggest using two-stage Heckman estimation procedure

- Need to address both sample selection and endogeneity
  - Heckman IV estimation procedure as proposed by Lee, Maddala and Trost (1980)
  - Estimate the fitted tax variables in both selection and level equations and bootstrap the standard errors
  - Exclusion restrictions: Trade openness and Financial openness

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Summary statistics of all variables used in the empirical analysis

Variables	Observ-ation	Mean	S.D.	Minimum	Maximum
Real net FDI flow	338	906.4	1,686.6	0.8	16,648.7
Bilateral EATR	338	16.9	8.1	6.8	37.8
Host GDP	338	288,800.0	201,200.0	69,040.0	897,300.0
Home GDP	338	4,187,000.0	4,769,000.0	138,800.0	16,160,000.0
Distance	338	8,141.4	4,125.9	326.0	16,337.0
Colonial	338	0.3	0.5	0.0	1.0
Working age share	338	66.7	3.7	58.7	72.0
Short-term debt to reserve	338	31.4	16.7	9.1	89.5
Host regulation quality	338	49.7	15.0	23.0	76.0
Host violence absence	338	31.9	20.7	4.3	64.9
Trade openness	338	136.2	34.7	60.2	210.4
Host financial openness	338	-0.3	0.8	-1.2	1.1
Home financial openness	338	2.2	0.4	1.1	2.4

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Base Gravity Specification results

- The bilateral EATR variable constitutes the main focus point
- Its coefficient is negative and statistically significant throughout
- Other coefficients generally have expected signs

VARIABLES	(1) Gravity	(2) Gravity +Econ	(3-Base) Gravity+Econ +Institution	(4-Base) Beta coefficient
Bilateral EATR	-0.072***	-0.075***	-0.074***	-0.339***
	(0.022)	(0.022)	(0.025)	
Log(Host GDP)	2.429	1.492	0.080	0.029
	(2.004)	(2.354)	(2.795)	
Log(Home GDP)	1.354	1.524	1.278	0.944
	(0.941)	(0.952)	(1.110)	
Log(Distance)	-0.070	-0.155	-0.205	-0.096
	(0.196)	(0.185)	(0.190)	
Colonial	0.177	0.120	0.139	0.036
	(0.219)	(0.219)	(0.224)	
Working age		0.149	0.120	0.254
		(0.172)	(0.181)	
Debt to reserve		-0.007	-0.007	-0.067
		(0.008)	(0.009)	
Trade openness		0.001	0.002	0.047
		(0.004)	(0.004)	
Host regulation quality			0.050**	0.422**
			(0.025)	
Host violence absence			-0.007	-0.078
			(0.011)	
Host corruption control			-0.017	-0.147
			(0.017)	
Host financial openness			0.152	0.065
			(0.191)	
Home financial openness			1.567**	0.385**
			(0.791)	
Constant	-96.299*	-85.939	-44.457	
	(58.317)	(62.058)	(74.593)	
Observations	369	353	338	338
R-squared	0.584	0.604	0.604	0.604
Fixed Effects	Home,Host, Time	Home,Host, Time	Home,Host, Time	Home,Host, Time

Notes: Columns (1)-(3) present the IV panel regression results of the gravity model specifications. Column (4) presents the beta coefficients associated with the base model. Numbers in parentheses indicate robust standard error. *** = Significantly different from zero at the 1% level, ** = Significantly different from zero at the 5% level, * = Significantly different from zero at the 10% level.

Main Findings

Taxation plays an important role in attracting the FDI into the region..

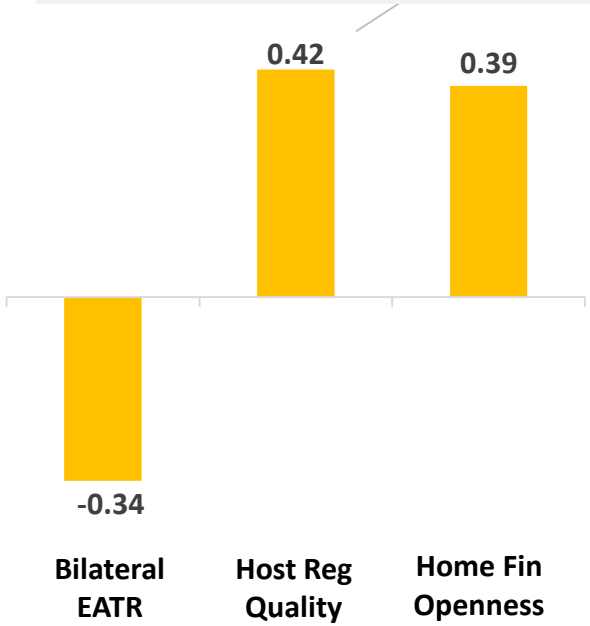
- **Tax elasticity = -7.4**
  - A one percentage point cut in the bilateral EATR increases net FDI by 7.4% holding other variables constant
  - A bit higher than previous estimates—Tax burden is more salient for investors in ASEAN

Past estimates using bilateral EATR	
Mooij&Ederveen (2008)	**-5.9**
Bellak and Leibrecht (2009)	**-4.3**
Egger et al. (2009)	**-5.1**

..but its role should not be overemphasized

Selected beta coefficients (Base model)

The economic significance of regulatory quality is roughly comparable to that of taxation



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Sensitivity Analyses

A) Ignoring endogeneity	Coefficient
Bilateral EATR	-0.058** (0.023)

Ignoring endogeneity yields sizable bias—on the order of 1.6%

B) Possible sample selection problem	Coefficient
Inverse Mills Ratio	-0.863 (0.943)

Sample selection is less likely to be an issue here

C) Country-pair fixed effects	Coefficient
Bilateral EATR	-0.067* (0.038)

Accounting for time-invariant unobserved heterogeneity across pairs yields similar results

D) Alternative measure of tax burden	Coefficient
Host statutory rate	0.038 (0.068)

Improperly incorporating relevant tax costs leads to heavy underestimation

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

Key Takeaways

1. Taxation is an important factor attracting FDI into the region—the estimated tax elasticity is about -7.4

2. The choice of tax measures matters—failing to properly take into account international taxation yields significant underestimates

3. But the role of taxes should not be overemphasized. Institutional factors such as regulation quality are also important

Athiphat Muthitacharoen, PhD | Economics, Chulalongkorn University | athiphat.m@chula.ac.th

Appendix

Literature Review

1 Formulation of Forward-Looking Effective Tax Rates	
Auerbach (1979), King and Fullerton (1984)	Effective marginal tax rate (EMTR), applicable for marginal investment
Devereux and Griffith (2003)	Effective average tax rate (EATR), applicable for an investment project with positive economic profit

2 Evaluation of the impact of taxation on FDI location choices	
Devereux and Griffith (1998)	Examine US investment in Europe
Bellak and Leibrecht (2009)	Examine Central and East-European host countries
Egger et al. (2009)	Examine investment within OECD
Klemm and Van Parys (2012)	Examine Africa, Latin American and Caribbean host countries. Use statutory tax rates and tax holiday dummy

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Assumptions on the investment projects

- Standard depreciation practices (Straight line and Declining balance)
- Two investment assets: Machinery and Building
  - Calibrated Using Thailand's input-output table to represent an average investment project (Machinery = 59%, Building = 41%)
- Economic depreciation rates (consistent with literature)
  - Machinery = 12.25%, Building = 3.6%
- Profit rate = 20% (consistent with literature)
- Real interest rate = 5%
- Inflation = 2%

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Tax structure of the ASEAN5 host countries

	Indonesia	Malaysia	Thailand	Philippines	Vietnam
Statutory tax rate	- 30% (2000-2008 ex. 2002 = 39%) - 28% (2009) - 25% (2010-2015)	- 28% (2000-2006) - 27% (2007) - 26% (2008) - 25% (2009-2015)	- 30% (2000-2011) - 23% (2012) - 20% (2013-2015)	- 32% (2000-2005) - 35% (2006-2008) - 30% (2009-2016)	- 33% (2000) - 32% (2001-2003) - 28% (2004-2008) - 25% (2009-2013) - 22% (2014-2015) - 20% (2016)
Depreciation allowance	- Machinery (12.5%) - Building (5%)	- Machinery (14%) <u>2000-2001</u> - Building (2%) <u>2002-2015</u> - Building (3%)	- Machinery (20%) - Building (5%)	- Machinery (25%) - Building (5%)	- Machinery (13%) - Building (4%)
Max tax incentives	<u>2000-2009</u> - Holiday = 8 years <u>2010-2015</u> - Holiday = 10 years - Post-holiday = 50% cut in tax rate for 2 years	- Holiday = 10 years - Post-holiday = 20% tax rate for 10 years	- Holiday = 8 years - Post-holiday = 50% cut in tax rate for 5 years	- Holiday = 8 years - Post-holiday = 5% tax rate indefinitely	- Holiday = 4 years - Post-holiday = 50% cut in tax rate for 9 years - Basic rate = 10% for 15 years - Years 1-4 = 0%, 5-13 = 5%, 14-15=10%, 16 onwards = normal rate

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