TBT Cooperation and Agricultural Flow: Evidence from ASEAN

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TBT measures: a brief introduction

- *Technical Barriers to Trade (TBT) is one of the most frequently encountered NTMs for agricultural trade.*
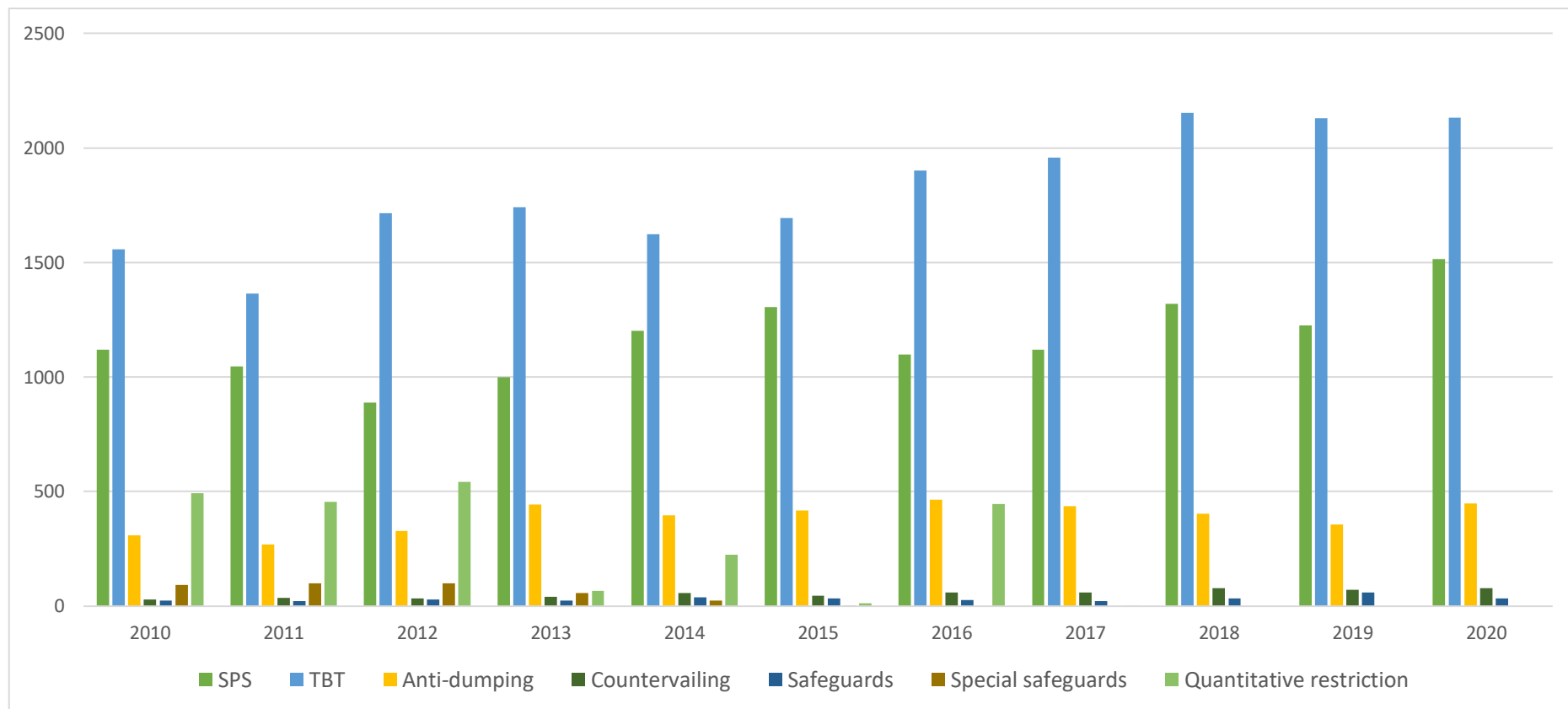
Fig. 1 Total count of main NTMs, 2010 ~ 2020
Data source: TWO

Concept: What is TBT?

- Technical Barriers to Trade, measures referring to *technical regulations* and *conformity assessment procedures (CAPs)*, excluding measures covered by the SPS Agreement (measures related to the safety issues).

- Principles: *non-discrimination* and *the avoidance of unnecessary obstacles to trade*.
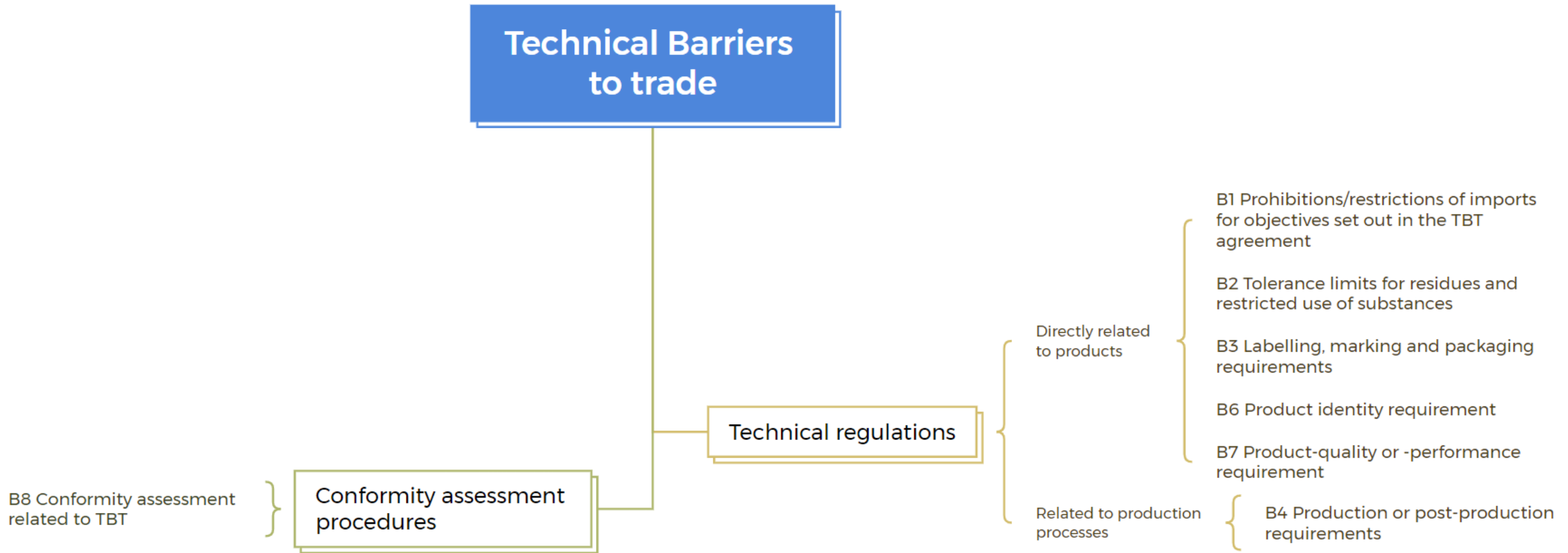
- TBT measures regulate various aspects of one product, they are ubiquitous.

TBT measures: a brief introduction
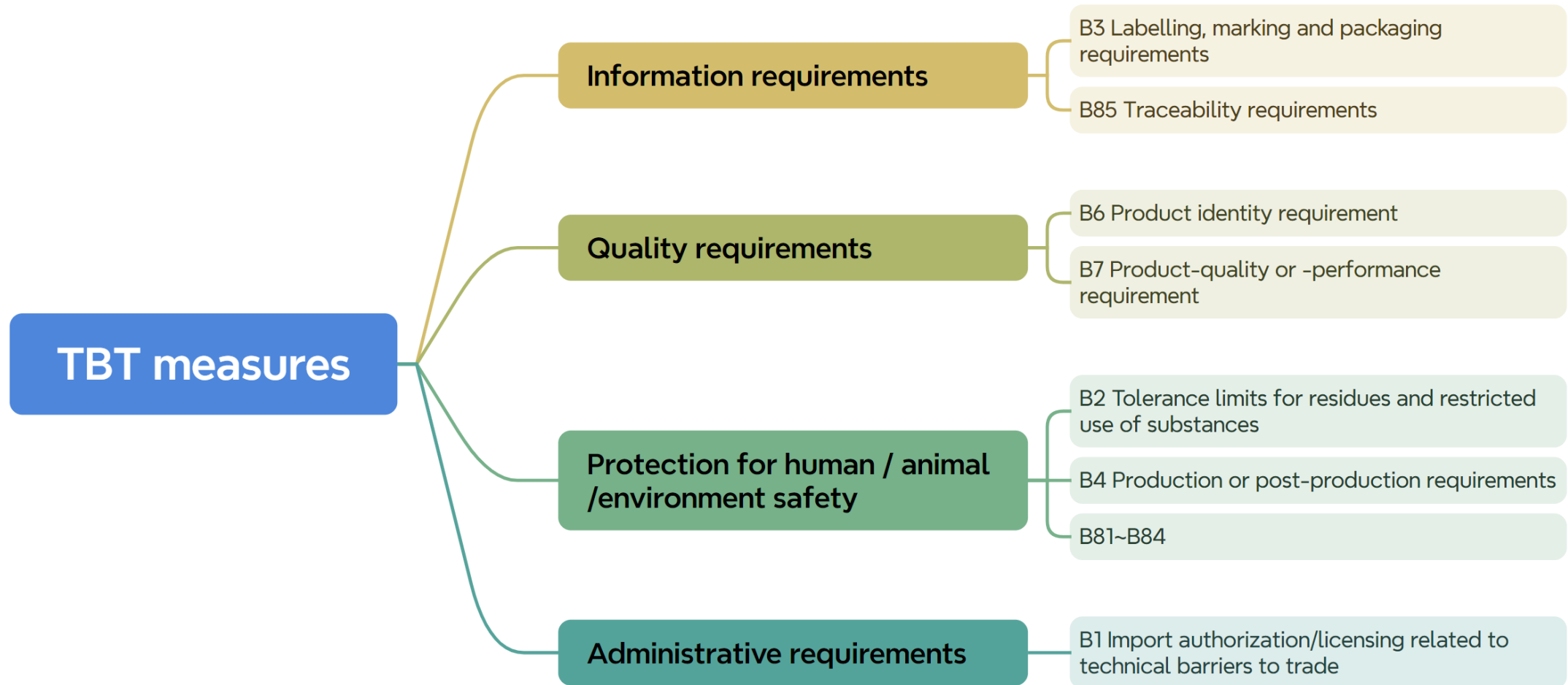
- To some extent, TBT measures achieve to *reduce the asymmetric information* between producers and consumers.

TBT measures: a brief introduction

- *Problem: un-harmonized TBT policies via countries*

  - Different benchmark standard

  - Different policy objectives

  - The total count of TBT measures

- This makes *TBT policies much more intricate, and may create unnecessary obstacles to trade flow* (e.g. increased compliance cost, threaten to market access).

- Therefore, *regulatory cooperation on TBT measures* has becoming an emerging trend in recent negotiations for FTAs.

Literature review

The impact of regulatory cooperation

- There is a large body of literatures estimating the impact of FTAs (e.g. Grant and Lambert 2008; Jayasinghe and Sarker 2008).

- Literatures about the impact of regulatory cooperation in FTAs are limited:

  ➢ The impact on trade flow: Disdier *et al*. (2015); Lejárraga and Shepherd (2013); Santeramo and Lamonaca (2022)

  ➢ The impact on the price of imported goods: Cadot and Gourdon (2016)

- These papers stress *the significance of regulatory cooperation*.

Research questions

- Given that *the clauses related to regulatory cooperation vary across countries*, the impact on total trade flow is still an open empirical question.

- Therefore, we address the following research questions:

  - ✓ What is the impact of regulatory cooperation on the total trade flow?

  - ✓ How do the specific clauses affect trade flow?

Academic contribution

- Our work is an extension of literature on regulatory cooperation:

  - ✓ Fill the gap of developing countries' practices of regulatory cooperation.

  - ✓ A supplement to the discussion of the importance of transparency issues.

Study Area: why ASEAN?

- A main supplier of agricultural products on the international market.

- Most of whose members are developing countries.

- The compliance with SPS and TBT measures is especially worrisome for those developing countries; Little attention is given to developing countries' practices of regulatory cooperation.

TBT cooperation: ASEAN's practices

- ASEAN and the member countries actively negotiate FTAs with surrounding countries.

- 10 / 18 FTAs contain the TBT cooperation chapter.

- With respect to the difference in TBT policies between ASEAN and the FTA partners, several cooperation clauses are adopted: *mutual recognition*, *standard harmonization*, *transparency* and the establishment of *sub-committee*.

- These clauses *go beyond WTO's requirements*, and play an important role in eliminating the adverse trade impact from TBT measures.

TBT cooperation: ASEAN's practices

FTA relationship

Partial cooperation (1)

- **Mutual recognition** implies that countries agree to mutually recognize each other's standards as equivalent, thus granting products that meet any of the two countries' standards unrestricted access to their markets.

- Mutual recognition is usually applied to CAPs.

TBT *cooperation: ASEAN's practices*

FTA relationship

- No
- Yes
  - TBT Cooperation Chapter
    - No
    - Yes
      - Mutual recognition
      - Standard harmonization
    - Transparency
    - Sub-committee

Partial cooperation (2)

- There are circumstances in which differences in standards are too large and mutual recognition is neither desirable nor viable. In these circumstances, countries may require a certain degree of ***standards harmonization*** as a precondition to allow entry into their markets.

- Standards harmonization is applied to technical regulations.

- When neither recognition nor harmonization is feasible or desirable: increasing the **transparency** of their national standards and technical regulations.

Transparency

Enquiry point

Notification obligations

Publication requirements
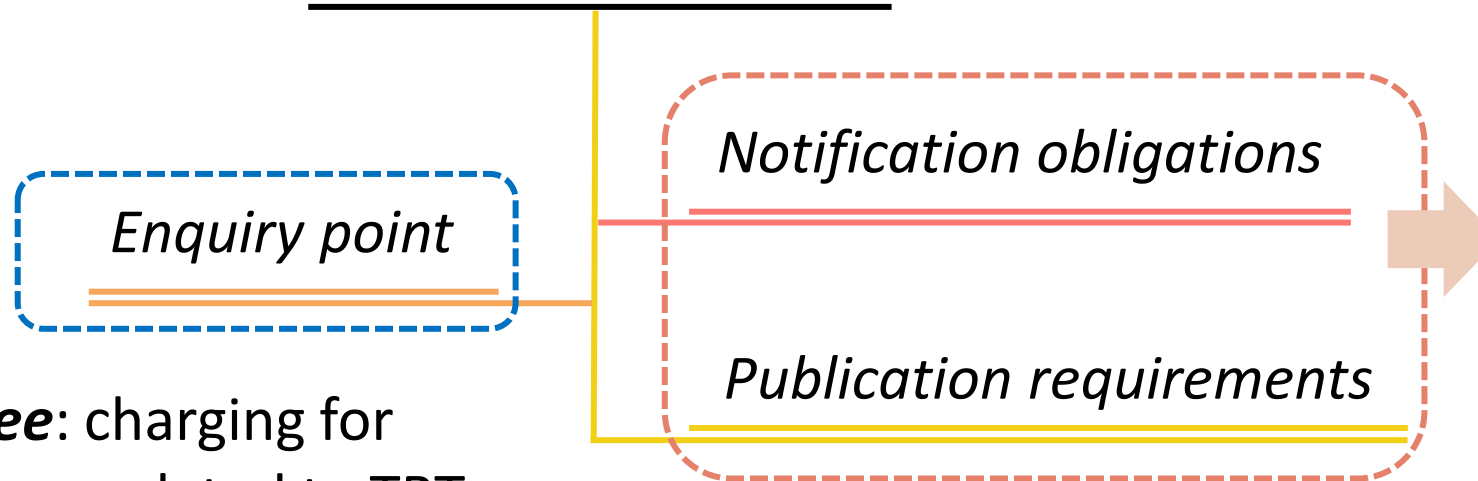
- An independent section named **transparency** in TBT cooperation chapter.

- **Sub-committee**: charging for consulting issues related to TBT measures and solving disputes.

Methodology

Measures to capture the impact

- Different measures have been suggested in the literature for identifying NTMs and estimating the impact.

  - ✓ Dummy variables to identify the existence of NTMs

  - ✓ Frequency index/coverage ratio/prevalence ratio

  - ✓ Ad valorem equivalent (AVE)

Methodology

Measures to capture the impact

- Different measures have been suggested in the literature for identifying NTMs and estimating the impact.

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  - ✓ Frequency index/coverage ratio/<u>prevalence ratio</u>

  - ✓ Ad valorem equivalent (AVE)

Methodology

Prevalence index

$$Prevalence\ index_{ijt}^{K} = \left[\frac{\sum_{k} N_{ijt}^{k} M_{ijt}^{k}}{\sum_{k} M_{ijt}^{k}} \right]$$

N_{ijt}^{k} : total count of TBT measures applied in country *j* (multilateral measures).

M_{ijt}^{k} : Dummy variable, indicating whether there are imports of product *k*.

▪It measures the average count of NTMs that is actually imposed based on the import.

▪The prevalence index is a trade-free indicator and thus would not suffer form any downward bias.

▪An interpretation of differences in prevalence indices across countries may not be that straightforward as they may express divergence in the regulatory approach.

Q1: the overall impact of TBT cooperation on total trade flow

$$X_{ijt}^{K} = \exp\left(\begin{array}{c} Z_{jt}^{K} + Z_{jt}^{K} \times TBT\ Cooperation_{ijt} + Tariff_{ijt}^{K} + FTA_{ijt} \\ +\varphi_{ij} + \mu_{it} + \tau_{j} + \vartheta^{k} \end{array}\right)\varepsilon_{ijt}^{k}$$

$$Where\ Z_{jt}^{K} = [TBT_{jt}^{K}, Prevalence\ index_{jt}^{K}]$$

- X_{ijt}^{K}: HS 2-digit level import value (unit: thousand US dollars)

- TBT_{jt}^{K}: dummy variable indicating the existence of TBT measures at HS 2-digit level.

- $\varphi_{ij}, \mu_{it}, \tau_{j}$ and ϑ^{k}: pair-specific, exporter-year, importer-specific and product-specific FEs

Q2: the impact of specifics clauses

$$X_{ijt}^k = \exp\left(T_{ijt} + \varphi_{ij} + \mu_{it} + \tau_j + \vartheta^k\right)\varepsilon_{ijt}^k$$

$$Where\ T_{ijt} = [TBT\ Cooperation_{ijt}, Transparency_{ijt},$$

$$Sub\_committee_{ijt}\ ]$$

- X_{ijt}^k: product-level import value (unit: thousand US dollars)

- $\varphi_{ij}, \mu_{it}, \tau_j$ and ϑ^k: pair-specific, exporter-year, importer-specific and product-specific FEs

FTA relationship

No

Yes

TBT Cooperation Chapter

No

Yes $TBT\ Cooperation_{ijt} = 1$

Mutual recognition

Standard harmonization

Transparency

Sub-committee

Dummy variables, equal to one when there are related clauses in FTA provision.

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Q2: the impact of specifics clauses

$$X_{ijt}^k = \exp(Technical\ regulations_{jt}^k + Technical\ regulations_{jt}^k \times Harmonization_{ijt}$$
$$+ CAPs_{jt}^k + CAPs_{jt}^k \times Mutual\ recognition_{ijt} + \varphi_{ij} + \mu_{it} + \tau_j + \vartheta^k)\varepsilon_{ijt}^k$$

- $Technical\ regulations_{ijt}^k$: the logarithm of total count of technical regulations.

- $CAPs_{ijt}^k$: the logarithm of total count of measures related to CAPs.

- $Harmonization_{ijt}$ and $Mutual\ recognition_{ijt}$: dummy variables, equal to one when there are related clauses in the FTA provision.

- Estimation method: Poisson Pseudo-Maximum Likelihood (**PPML**)
  - ✓ Solve heteroskedasticity
  - ✓ Incorporate zero observations

Data Description

- *Exporters (7):*

Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, Vietnam

- *Importers (17):*

(main trading partners who establish FTA with ASEAN or ASEAN members)

Australia, China, Germany, Hong Kong SAR, India, Indonesia, Italy, Japan, Korea, Malaysia, Netherlands, Philippines, Singapore, Spain, Thailand, United States, Vietnam

- *Products (35):*

030462, 030613, 030617, 071331, 071410, 080132, 080300, 080390, 080450, 081060, 081090, 090111, 090411, 106030, 106040, 110814, 151110, 151190, 151311, 151319, 151329, 151620, 151790, 160232, 160414, 160520, 160521, 160529, 170111, 170114, 170199, 180400, 190190, 190590, 200820

- *Time period: 2000 ~ 2021* (after the massive adoption of NTMs)

Result and discussion

Overall impact of TBT cooperation

(estimation based on HS 2-digit level data)

- Both of the interaction terms receive positive and significant result.

- TBT cooperation additionally increases the trade flow.

Dependent variable	Column (1) Import value	Column (2) Import value	Column (3) Extensive margin	Column (4) Intensive margin
Variables				
TBT_{ijt}^{K}	0.46***			
	(0.11)			
$TBT_{ijt}^{K} \times TBT\ cooperation_{ijt}$	0.50***			
	(0.14)			
$Prevalence\ index_{ijt}^{K}$		0.07***	0.038***	0.045***
		(0.01)	(0.002)	(0.002)
$Prevalence\ index_{ijt}^{K} \times TBT\ cooperation_{ijt}$		0.02***	0.03***	0.02***
		(0.00)	(0.00)	(0.00)
$\log\left(Tariff_{ijt}^{K} + 1\right)$	-0.12	-0.13***	-0.14***	0.03
	(0.02)	(0.02)	(0.01)	(0.01)
FTA_{ijt}	-0.19	0.05	0.10**	0.03
	(0.13)	(0.12)	(0.04)	(0.06)
Importer FE	Y	Y	Y	Y
Exporter-time FE	Y	Y	Y	Y
Country-pair FE	Y	Y	Y	Y
Product FE	Y	Y	Y	Y
Observations	19394	19394	19394	19394

Overall impact of TBT cooperation

• The impact on trade margins: TBT cooperations improve the possibility to trade as well as the market access.

Dependent variable	Column (1) Import value	Column (2) Import value	Column (3) Extensive margin	Column (4) Intensive margin
Variables				
TBT_{ijt}^{K}	0.46***			
	(0.11)			
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FTA_{ijt}	-0.19	0.05	0.10**	0.03
	(0.13)	(0.12)	(0.04)	(0.06)
Importer FE	Y	Y	Y	Y
Exporter-time FE	Y	Y	Y	Y
Country-pair FE	Y	Y	Y	Y
Product FE	Y	Y	Y	Y
Observations	19394	19394	19394	19394

The impact of specific clauses

(estimation based on HS 6-digit level)

- Overall impact of *TBT cooperation*: TBT cooperation generally imposes a positive impact on ASEAN's agricultural export.

	Column (5)	Column (6)	Column (7)	Column (8)
$\textit{TBT Cooperation}_{ijt}$	0.24^{*}			
	(0.12)			
$\textit{Technical regulations}_{jt}^{k}$		0.42^{***}		
		(0.04)		
$\textit{Standard harmonization}_{ijt}$ $\times \textit{Technical regulations}_{jt}^{k}$		0.16^{***}		
		(0.05)		
$\textit{CAPs}_{jt}^{k}$		0.15^{***}		
		(0.04)		
$\textit{Mutual recognition}_{ijt}$ $\times \textit{CAPs}_{jt}^{k}$		-0.28		
		(0.13)		
$\textit{Transparency}_{ijt}$			0.26^{**}	
			(0.12)	
$\textit{Sub\_committee}_{ijt}$				0.16
				(0.11)
Exporter-year FE	Y	Y	Y	Y
Exporter-importer FE	Y	Y	Y	Y
Importer FE	Y	Y	Y	Y
Product FE	Y	Y	Y	Y
Observations	56624	53130	56624	56624

Result and discussion

- The role of *standard harmonization*: standard harmonization eliminates some TBT measures that cause unnecessary obstacles to trade flow.

- This finding is consistent with De Frahan and Vancauteren (2006)'s work.

	Column (5)	Column (6)	Column (7)	Column (8)
$TBT\ Cooperation_{ijt}$	0.24* (0.12)			
$Technical\ regulations_{jt}^{k}$		0.42*** (0.04)		
$Standard\ harmonization_{ijt} \times Technical\ regulations_{jt}^{k}$		0.16*** (0.05)		
$CAPs_{jt}^{k}$		0.15*** (0.04)		
$Mutual\ recognization_{ijt} \times CAPs_{jt}^{k}$		-0.28 (0.13)		
$Transparency_{ijt}$			0.26** (0.12)	
$Sub\_committee_{ijt}$				0.16 (0.11)
Exporter-year FE	Y	Y	Y	Y
Exporter-importer FE	Y	Y	Y	Y
Importer FE	Y	Y	Y	Y
Product FE	Y	Y	Y	Y
Observations	56624	53130	56624	56624

- The clause related to *transparency*: the emphasis on transparency also works to increase trade flow.

	Column (5)	Column (6)	Column (7)	Column (8)
$TBT\ Cooperation_{ijt}$	0.24* (0.12)			
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$Sub\_committee_{ijt}$				0.16 (0.11)
Exporter-year FE	Y	Y	Y	Y
Exporter-importer FE	Y	Y	Y	Y
Importer FE	Y	Y	Y	Y
Product FE	Y	Y	Y	Y
Observations	56624	53130	56624	56624

Conclusion

- TBT cooperation increases ASEAN's agricultural export, especially the introduction of standard harmonization and transparency clauses.

- *Policy implication:* ASEAN should actively negotiate the inclusion of TBT cooperation into the FTA provisions with FTA partners.

Next steps: heterogeneity analysis
- Bilateral/multilateral cooperation
- TBT measures with different policy objectives

Thank you for your listening!