Revisiting the Trade-Creating Effects of Non-Tariff Barriers

Gabriel Felbermayr & Feodora Teti

ifo Institute & LMU

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Motivation

Modern trade negotiations are very much centered around non-tariff barriers (NTBs)

1. multilateral WTO-rounds
2. bilateral trade agreements

WTO
@wto

#ICYMI On 17 June at #MC12, WTO ministers reached historic agreements on:

▶ Response to food insecurity
▶ @wfp food purchases exemption
▶ WTO response to the pandemic
▶ #TRIPS
▶ #Ecommerce moratorium
▶ #FisheriesSubsidies

More: bit.ly/3aVH5V9

12:09 PM · Jun 18, 2022 · Sprout Social

Source: Twitter https://twitter.com/wto/status/1538101490501529600.

Brexit talks: what are the main obstacles to a deal?

As deadline to secure agreement nears, EU-UK negotiators seek route to final 'submarine' phase

The UK's chief Brexit negotiator David Frost (top left) and his counterpart Michel Barnier are racing to thrash out agreements on contentious areas such as fishing access and state aid © FT montage; Getty Images; Reuters

Jim Brunsden in Brussels OCTOBER 1 2020

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Source: Financial Times https://www.ft.com/content/af697135-1148-4f2e-b306-72080d937217.

Motivation

More than tariffs, trade agreements today are about regulatory measures and other so called "non-tariff measures", that were once the exclusive domain of domestic policy-making. For these reasons, "deep" trade agreements, as trade experts refer to this new class of agreements, are fundamentally different than the previous generation of trade agreements. (Lamy 2020)

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However, results are biased due to omitted variables, above all mismeasured tariffs.

This paper asks...

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Do trade agreements lower NTBs?

1. Do "deep" RTAs with many provisions reduce NTBs?
2. Are there any RTAs that reduce NTBs?
3. Are the NTB-reducing RTAs systematically different with respect to their content?

This paper shows that...

...existing results on positive NTB-effects through RTAs are biased.

- mismeasured tariffs in standard sources and omission of trends yield substantial upward-bias
- positive NTB-effect of "deep" agreements vanishes once adequately controlling for tariffs and globalization

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... some agreements, in fact, reduce NTBs.

- But the results are highly heterogeneous.

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... some agreements, in fact, reduce NTBs.

- But the results are highly heterogeneous.

... it is not obvious whether the content can help to predict high NTB-effects

- Lasso-analysis of roughly 1,000 provisions gives weak evidence for higher NTB-effects for RTAs that contain provisions that reduce NTBs multilaterally.

Contribution and related literature

This paper contributes to the existing literature on...

1. ...NTBs and trade.
   → Ederington and Ruta (2016) give an excellent overview.

2. ...(heterogeneous) effects of RTAs on trade flows.
   → e.g., Aichele et al. (2016), Baier and Bergstrand (2007), Baier, Bergstrand, and Feng (2014), Baier, Yotov, et al. (2019), Dhingra et al. (2021), Dür et al. (2014), Felbermayr et al. (2018), Hofmann et al. (2019), and Kohl et al. (2016).

3. ...machine learning and other related methods to study the effects of trade agreements in the gravity context.
   → e.g., Baier and Regmi (2021) and Breinlich et al. (2021).

Empirical Strategy

We start with a **standard gravity:**

$$X_{ijkt} = \frac{Y_{ikt} E_{jkt}}{Y_{kt}} \frac{\mathcal{T}_{ijkt}}{\Omega_{ikt} \Omega_{jkt}}$$

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$$\mathcal{T}_{ijkt} = (1 + \tau_{ijkt})^{-\sigma} + (\Phi_{ijkt})^{1-\sigma}$$

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Bilateral non-tariff trade costs consist costs *i)* **unrelated to trade policy** and *ii)* **trade policy.**

$$\Phi_{ijt} = \prod (T_{ijt})^{\delta} \times exp\left(\sum^{p} \beta_p \; TA^{p}_{ijt}\right) \text{ with } p \in [deep, shallow, EnCl]$$

Empirical Strategy

We end up with the following estimation equation:

$$X_{ijkt} = exp[-\sigma\ ln(1+\tau_{ijkt}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijk} + \nu_{ikt} + \nu_{jkt}] + \epsilon_{ijkt}.$$

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- We include domestic trade flows and zero trade
- estimate the model multiplicatively with PPML, for consecutive years
- standard errors are clustered three-way (importer exporter year)
- importer- and exporter-(sector-)time fixed effects (ν_{ikt} and ν_{jkt})
- pair-(sector) fixed effects (μ_{ijk})

OMV due to Misreported Tariffs

$$X_{ijkt} = exp[-\sigma\ ln(1+\tau_{ijkt}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijk} + \nu_{ikt} + \nu_{jkt}] + \epsilon_{ijkt}.$$

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- if τ is noisily measured, β_1 will capture both, the effect of NTBs AND tariffs

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- if τ is noisily measured, β_1 will capture both, the effect of NTBs AND tariffs
- Teti (2020) shows that tariffs from standard sources suffer from substantial measurement error

Measurement Error in Tariffs: MFN and Preferential Tariffs

MFN tariffs (Most Favored Nation)

- all WTO members have for each product (5,000 products) the same tariffs against all other WTO members (principle of non-discrimination)
  - → U.S. tariff on cars is the same for exporters from Germany and Switzerland

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Preferential tariffs

- Regional trade agreement (RTA): NAFTA, EU-Canada
  - → no U.S.-tariffs on Mexican imports
- different types of RTAs: customs union (EU), bilateral trade agreements (NAFTA), nonreciprocal trade agreements (GSP)

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In theory, WITS gives exactly this:

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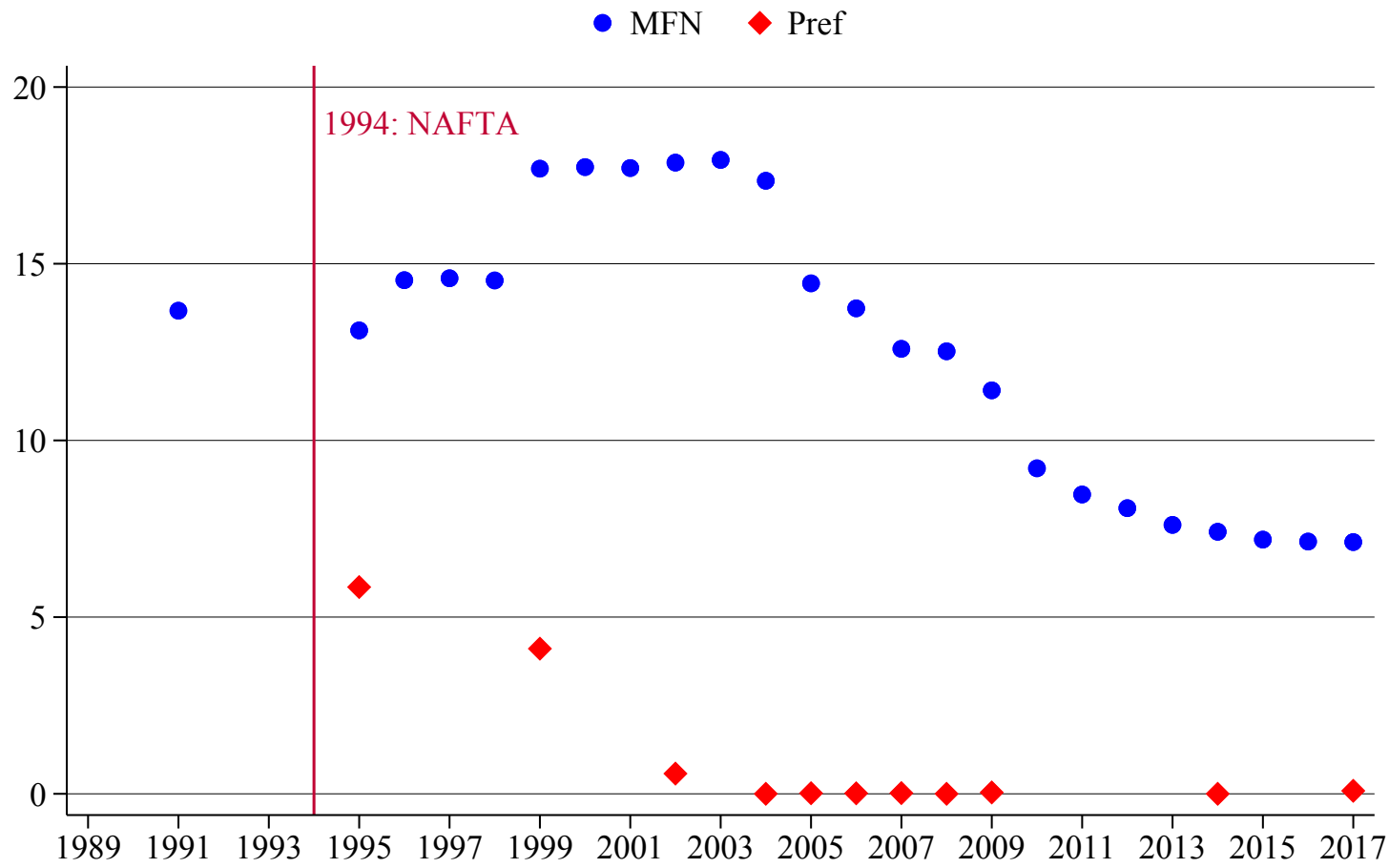
However, countries misreport

- Particularly preferential tariffs are not reported every year

$\rightarrow$ Measurement error: every time a country reports the MFN tariff but not the preferential one standard sources for tariffs will give an MFN instead of a preferential tariff.

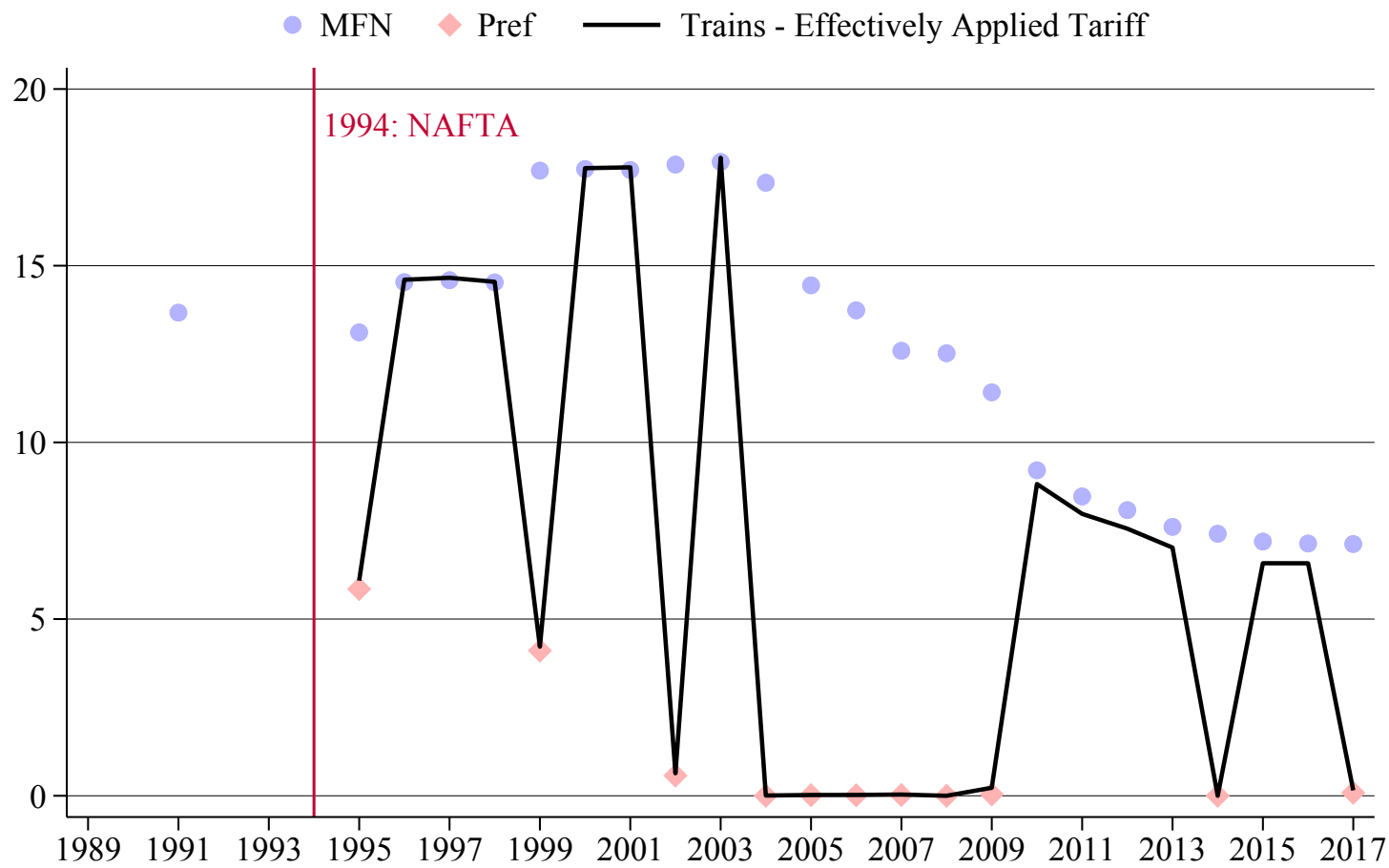
What do Countries Report?

Example: Mexico-United States



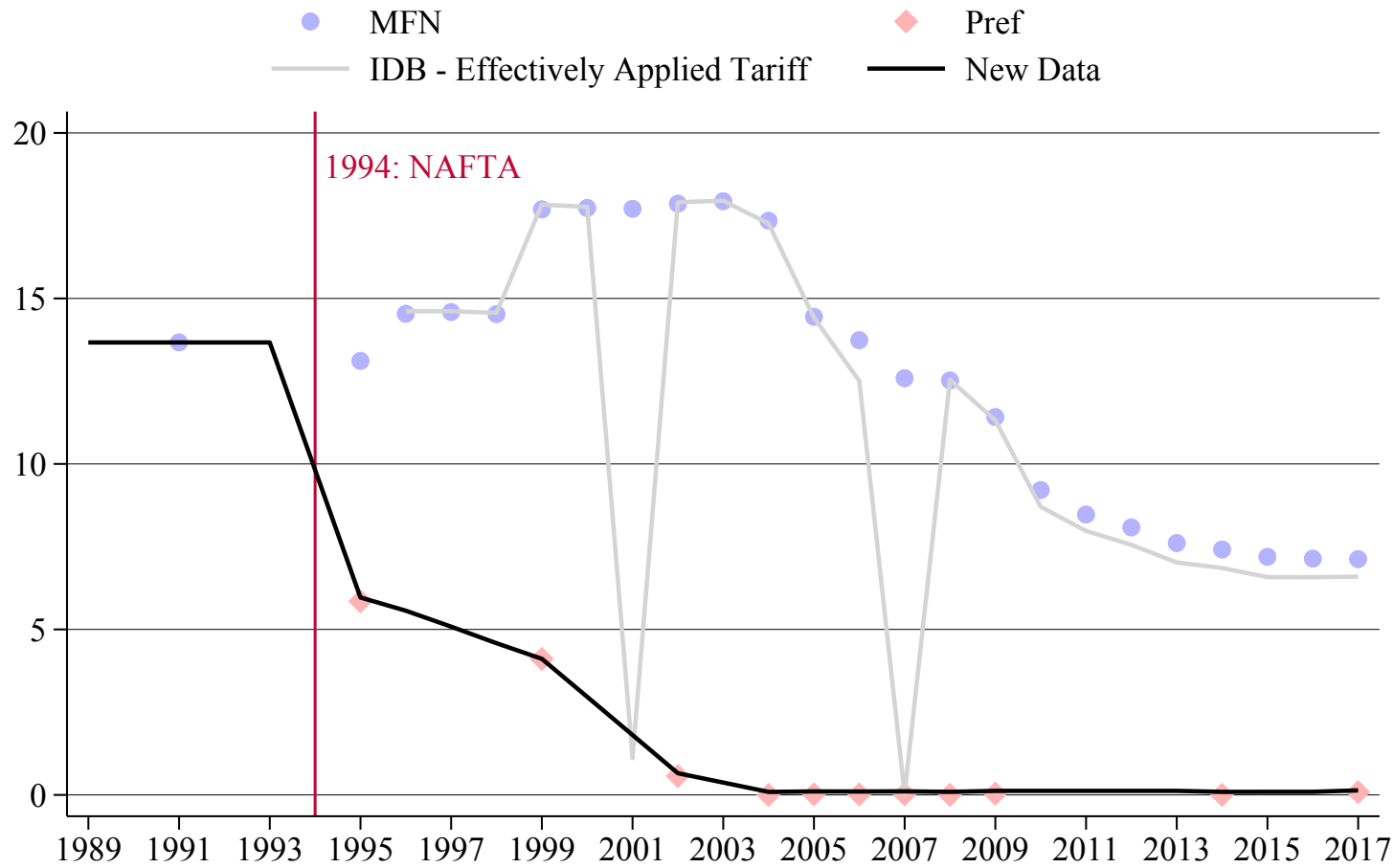
What is the Effectively Applied Tariff in Trains?

Example: Mexico-United States $\Rightarrow t_{ijt} = min\{MFN_{it}; Pref_{ijt}\}$



Teti (2020) fixes the mismeasurement: new Global Tariff Database (new GTD)

Example #1: Mexico-United States $\Rightarrow t_{ijt} = min\{MFN_{it}; Pref_{ijt}\}$



Data

Tariffs

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Sample

- 2000-2015
- 120 largest countries in terms of GDP in 2019.

The Role of Omitted Variables: Tariffs

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst}] + \epsilon_{ijst}.$$

	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD
Deep TAs	0.25***	0.21**	0.14	0.15*
	(0.10)	(0.09)	(0.09)	(0.08)
Shallow TAs	0.02	-0.01	-0.07	-0.06
	(0.10)	(0.10)	(0.10)	(0.09)
Enabl. Clause	0.05	0.04	0.00	0.00
	(0.06)	(0.06)	(0.06)	(0.06)
$ln(1+\tau)$		-1.08*	-2.99***	-2.90***
		(0.59)	(0.81)	(0.84)
MFN Openness				
N	474312	360522	360522	474312

Note: All columns include importer-sector-time, exporter-sector-time, importer-exporter-sector fixed effects. Standard errors are clustered threeway for importer, exporter, and year. To measure depth we follow Hofmann et al. (2019) (all provisions), the trade data include three broad sectors (agriculture, manufacturing, services) for the years 2000 to 2015 and are put together by Borchert et al. (2020).

OMV due to Globalization

$$X_{ijkt} = exp[-\sigma\ ln(1+\tau_{ijkt}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijk} + \nu_{ikt} + \nu_{jkt} + Glob_{ijt}] + \epsilon_{ijkt}.$$

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- time-varying border dummies ($Glob_{ijt}$) to control for common globalization trends
  - general time trend to modernize RTAs must not necessarily mean that countries are pushing forward bilateral liberalization

The Role of Omitted Variables: Tariffs and Globalization

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	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$ln(1+\tau)$		-1.08*	-2.99***	-2.90***	-1.22*
		(0.59)	(0.81)	(0.84)	(0.63)
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Robustness and Channels

Robustness

- different definitions of depth legally enforceable DESTA
- longer time horizon (1989-2015) & different definition of depth Long—All Long—legally enforceable Long—DESTA
- alternative trade data (WIOD & Baci)
- more disaggregated sectors Sectors

Channels

- agreements with multilateral provisions have a trade creating effect, stressing importance of bigger reforms MFN openness
- trade in services is positively affected by deep trade agreements, goods-trade is not. Services
- no heterogeneous effects for agreements with high-income countries, G7-countries, EU or US. G7

RTA-specific NTB-Effects: Idea and Empirical Specification

Results so far suggest that...

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- not all provisions have to be trade promoting

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We estimate RTA-specific NTB-effects

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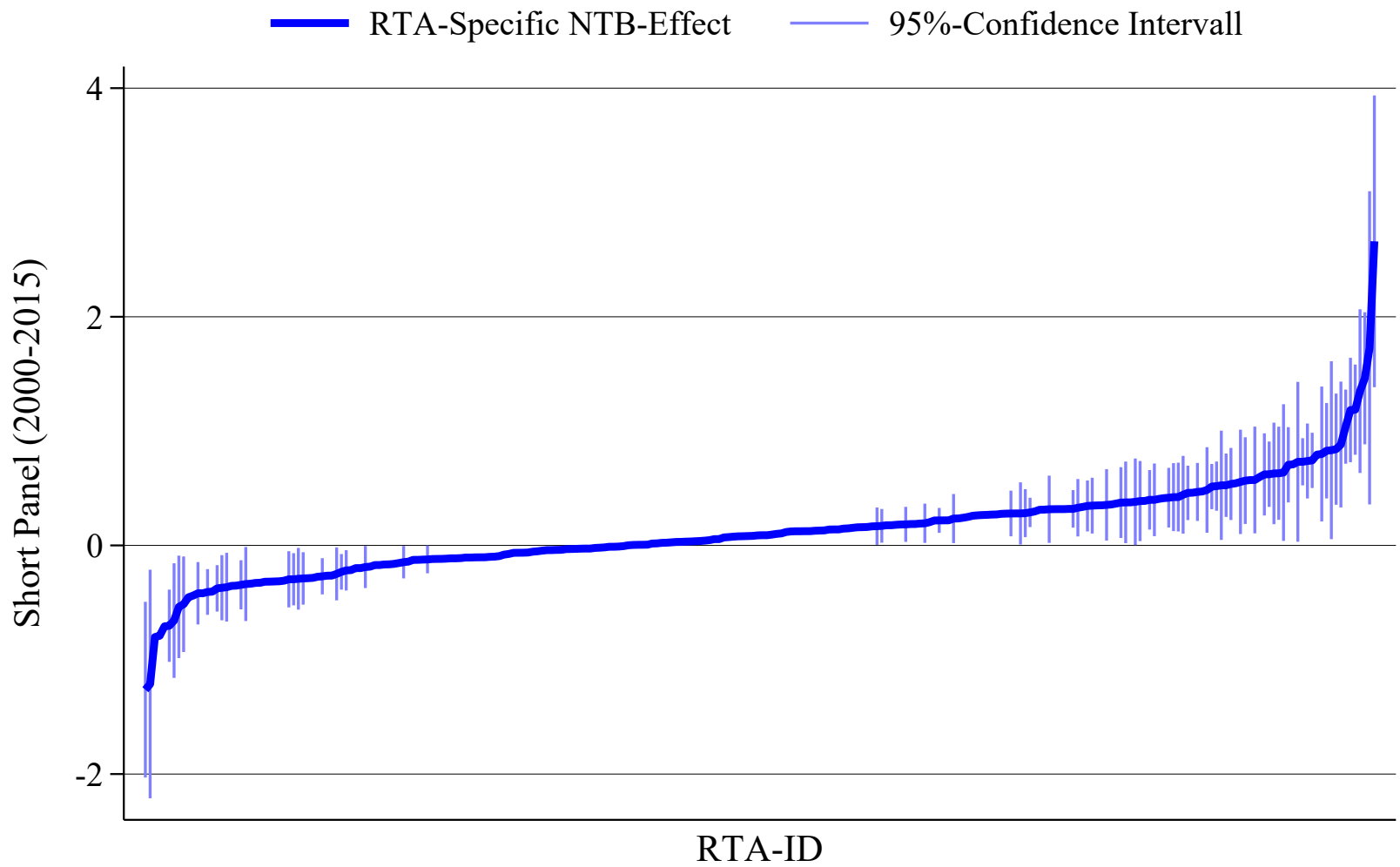
RTA-specific NTB-Effects: Results



RTA-specific NTB-Effects: Results

	All Estimates					95%-Level				
	(1) Nr.	(2) Mean	(3) pc(50)	(4) pc(25)	(5) pc(75)	(6) Nr.	(7) Mean	(8) pc(50)	(9) pc(25)	(10) pc(75)
All	258	0.121	0.089	-0.113	0.319	83	0.308	0.376	-0.218	0.623
Positive	157	0.350	0.276	0.128	0.459	59	0.604	0.515	0.348	0.731
Negative	101	-0.235	-0.167	-0.318	-0.081	24	-0.421	-0.341	-0.467	-0.260

- 61% of all coefficients are positive, 71% of all significant coefficients are positive and increase on average trade by 60%
- however, many negative RTA-effects, almost one third have a significant and negative effect.

Predicting NTB-Effects using the content of trade agreements —*PRELIMINARY*

Can we find persistent patterns in trade agreements that have large NTB-effects?

- Using detailed information on the content of trade agreements we can take advantage of new advances in the machine learning literature.
- Mattoo, Rocha, et al. (2020) have put together information on the presence of roughly 1,000 provisions

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Almost 1,000 variables, only 258 agreements

- Lasso (Least Absolute Shrinkage and Selection Operator) method for variable selection

Results Lasso

Description	Policy Area	Total
Does the transfer provision explicitly exclude 'good faith and non-discriminatory application of its laws' related to prevention of deceptive and fraudulent practices?	Movement of Capital	26
Prohibits new export taxes, but with refererence to exceptions mentioned in the provision	Export Taxes	17
Does the Agreement refer to the WTO SPS Agreement?	Sanitary and Phytosanitary	16
Does the agreement specify supremacy of MEA obligations over PTA obligations?	Environmental Laws	14
Prohibits voluntary export restraints inconsistent with GATT Article VI	Export Taxes	14
Freedom of transit for goods	Trade Facilitation and Customs	12
Origin verification measures	Trade Facilitation and Customs	10
Recognizes the Joint Recommendation Concerning Provisions on the Protection of Well-Known Marks	Intellectual Property Rights	9
Does the agreement contain explicit provisions on the prohibition of offsets?	Public Procurement	8
Prohibits all export taxes between the Parties, but with reference to certain exceptions mentioned in the provision that are WTO-plus	Export Taxes	8

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1. This paper shows that existing estimates of the NTB-effects of trade agreements are upwards biased due to omitted variables
2. The NTB-effect of "deep" trade agreements vanishes once adequately controlling for tariffs and globalization.
3. The NTB-effect varies substantially across different trade agreements.
4. *So far, not obvious whether content of trade agreements can help to predict high NTB-effects*

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3. The NTB-effect varies substantially across different trade agreements.
4. *So far, not obvious whether content of trade agreements can help to predict high NTB-effects*

$\Rightarrow$ Tariff reductions still matter, despite the globally low levels.

Thank You

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Baseline: Short Panel—Only Legally Enforcable Provision

	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) Glob	(6) MFN	(7) Glob-MFN
Deep TAs	0.27**	0.22*	0.14	0.17*	0.08	0.07	0.06
	(0.12)	(0.12)	(0.12)	(0.10)	(0.08)	(0.08)	(0.08)
Shallow TAs	0.06	0.03	-0.03	-0.02	0.01	-0.02	0.01
	(0.08)	(0.08)	(0.08)	(0.07)	(0.06)	(0.06)	(0.06)
Enabl. Clause	0.04	0.03	-0.00	-0.01	0.04	0.03	0.05
	(0.07)	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)
$ln(1+\tau)$		-1.10*	-2.98***	-2.88***	-1.22*	-1.64***	-0.97*
		(0.59)	(0.81)	(0.84)	(0.64)	(0.61)	(0.51)
MFN Openness						0.04***	0.01
						(0.01)	(0.01)
N	474312	360522	360522	474312	474312	474312	474312

Note: All columns include importer-sector-time, exporter-sector-time, importer-exporter-sector fixed effects. Standard errors are clustered threeway for importer, exporter, and year. To measure depth we follow Hofmann et al. (2019) (only legally enforceable provisions), the trade data include three broad sectors (agriculture, manufacturing, services) for the years 2000 to 2015 and are put together by Borchert et al. (2020).

Back Robustness

Baseline: Short Panel—Desta

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst} + \gamma MFNOpenness_{ijt} + Glob_{ijt}] + \epsilon_{ijst}.$$

	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) Glob	(6) MFN	(7) Glob-MFN
Deep TAs	0.18**	0.14*	0.07	0.08	0.06	0.05	0.05
	(0.08)	(0.07)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)
Shallow TAs	-0.05	-0.09	-0.15**	-0.14**	-0.08*	-0.15***	-0.09*
	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
Enabl. Clause	0.05	0.04	0.01	0.00	0.04	0.03	0.04
	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)
$ln(1+\tau)$		-1.17**	-3.09***	-3.06***	-1.27**	-1.65***	-0.98**
		(0.59)	(0.78)	(0.82)	(0.59)	(0.55)	(0.46)
MFN Openness						0.04***	0.01
						(0.01)	(0.01)
N	474312	360522	360522	474312	474312	474312	474312

Note: All columns include importer-sector-time, exporter-sector-time, importer-exporter-sector fixed effects. Standard errors are clustered threeway for importer, exporter, and year. To measure depth we follow Dür et al. (2014) (DESTA), the trade data include three broad sectors (agriculture, manufacturing, services) for the years 2000 to 2015 and are put together by Borchert et al. (2020).

Baseline: Long Panel—All Provisions

	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) Glob	(6) MFN	(7) Glob-MFN
Deep TAs	0.30***	0.15**	0.05	0.16**	0.05	0.03	0.01
	(0.08)	(0.06)	(0.05)	(0.08)	(0.06)	(0.06)	(0.07)
Shallow TAs	0.06	0.03	-0.05	-0.04	-0.04	-0.05	-0.05
	(0.09)	(0.11)	(0.11)	(0.09)	(0.08)	(0.07)	(0.07)
Enabl. Clause	0.01	-0.00	-0.05	-0.05	-0.01	-0.02	-0.00
	(0.05)	(0.04)	(0.04)	(0.05)	(0.05)	(0.05)	(0.05)
$ln(1+\tau)$		-1.65***	-3.55***	-3.19***	-1.39***	-1.96***	-1.05**
		(0.54)	(0.62)	(0.58)	(0.43)	(0.51)	(0.45)
MFN Openness						0.05***	0.02**
						(0.01)	(0.01)
N	683290	392839	392839	683290	683290	683290	683290

Note: All columns include importer-sector-time, exporter-sector-time, importer-exporter-sector fixed effects. Standard errors are clustered threeway for importer, exporter, and year. To measure depth we follow Hofmann et al. (2019) (all provisions), the trade data include three broad sectors (agriculture, manufacturing) for the years 1989 to 2015 and are put together by Borchert et al. (2020).

Back Robustness

Baseline: Long Panel—Only Legally Enforcable Provisions

	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) Glob	(6) MFN	(7) Glob-MFN
Deep TAs	0.36***	0.15*	0.03	0.20**	0.08	0.05	0.02
	(0.10)	(0.09)	(0.09)	(0.10)	(0.09)	(0.07)	(0.08)
Shallow TAs	0.09	0.06	-0.02	-0.01	-0.03	-0.04	-0.04
	(0.08)	(0.09)	(0.08)	(0.08)	(0.07)	(0.06)	(0.06)
Enabl. Clause	-0.00	-0.01	-0.05	-0.06	-0.01	-0.02	-0.00
	(0.06)	(0.04)	(0.04)	(0.06)	(0.06)	(0.05)	(0.05)
$ln(1+\tau)$		-1.67***	-3.58***	-3.15***	-1.35***	-1.95***	-1.03**
		(0.54)	(0.63)	(0.58)	(0.44)	(0.52)	(0.47)
MFN Openness						0.05***	0.02**
						(0.01)	(0.01)
N	683290	392839	392839	683290	683290	683290	683290

Note: All columns include importer-sector-time, exporter-sector-time, importer-exporter-sector fixed effects. Standard errors are clustered threeway for importer, exporter, and year. To measure depth we follow Hofmann et al. (2019) (only legally enforceable provisions), the trade data include three broad sectors (agriculture, manufacturing) for the years 1989 to 2015 and are put together by Borchert et al. (2020).

Back Robustness

Baseline: Long Panel—Desta

	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) Glob	(6) MFN	(7) Glob-MFN
Deep TAs	0.23***	0.13*	0.04	0.09	0.03	0.02	0.00
	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)	(0.06)	(0.06)
Shallow TAs	0.00	-0.06	-0.14*	-0.10	-0.09	-0.10	-0.10
	(0.08)	(0.09)	(0.08)	(0.08)	(0.07)	(0.07)	(0.06)
Enabl. Clause	0.01	-0.01	-0.05	-0.05	-0.01	-0.02	-0.00
	(0.06)	(0.05)	(0.05)	(0.06)	(0.06)	(0.05)	(0.05)
$ln(1+\tau)$		-1.70***	-3.58***	-3.36***	-1.43***	-1.98***	-1.05**
		(0.54)	(0.62)	(0.60)	(0.47)	(0.52)	(0.49)
MFN Openness						0.05***	0.02**
						(0.01)	(0.01)
N	683290	392839	392839	683290	683290	683290	683290

Note: All columns include importer-sector-time, exporter-sector-time, importer-exporter-sector fixed effects. Standard errors are clustered threeway for importer, exporter, and year. To measure depth we follow Dür et al. (2014) (Desta), the trade data include three broad sectors (agriculture, manufacturing) for the years 1989 to 2015 and are put together by Borchert et al. (2020).

Back Robustness

Disaggregated Sectors

$$X_{ijkt} = exp[-\sigma\ ln(1+\tau_{ijkt}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijk} + \nu_{ikt} + \nu_{jkt} + BRDR_{ijt}] + \epsilon_{ijkt}.$$

	All Provisions			Leg. Enforcable Prov.			Desta		
	(1) No Tariffs	(2) WITS	(3) New GTD	(4) No Tariffs	(5) WITS	(6) New GTD	(7) No Tariffs	(8) WITS	(9) New GTD
(B) Disaggregated Sectors, (FE: i-k-t, j-k-t, i-j-k)									
Deep TAs	0.08**	0.12***	0.06*	0.07*	0.15***	0.05	0.06*	0.05*	0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.03)	(0.03)	(0.03)
Shallow TAs	-0.00	-0.09**	-0.02	0.02	-0.05	0.01	-0.04	-0.11**	-0.05
	(0.03)	(0.04)	(0.04)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)	(0.05)
Enabl. Clause	0.10**	0.03	0.09**	0.10**	0.02	0.09*	0.09**	0.03	0.09*
	(0.05)	(0.04)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.04)	(0.05)
$ln(1+\tau)$		0.22	-0.60**		0.22	-0.60**		0.20	-0.62**
		(0.18)	(0.29)		(0.18)	(0.29)		(0.18)	(0.29)
N	3,335,346	2,027,568	3,335,346	3,335,346	2,027,568	3,335,346	3,335,346	2,027,568	3,335,346

Back Robustness

Data

Trade Agreements

- Mario Larch's RTA database (Egger and Larch 2008) gives information on partial scope agreements, free trade agreements, and customs unions.
- Database on Economic Integration Agreements maintained by Jeffrey Bergstrand and Scott Baier is the main source (Bergstrand et al. 2015) for non-reciprocal trade arrangements, we updated it to 2015 ourselves using the WTO's PTA database.

Back: Data

Data

Depth of Trade Agreements

- World Bank's Deep Trade Agreement Dataset (DTA data) provided by Hofmann et al. (2019).
  - codifies 52 provisions and distinguishes them across their legal enforceability
  - $deep_{ijt}$ equals one if a trade agreement covers more than 20 provisions and zero otherwise
  - $shallow_{ijt}$ is one if at most 20 provisions are covered.

Data

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- World Bank's Deep Trade Agreement Dataset (DTA data) provided by Hofmann et al. (2019).
  - codifies 52 provisions and distinguishes them across their legal enforceability
  - $deep_{ijt}$ equals one if a trade agreement covers more than 20 provisions and zero otherwise
  - $shallow_{ijt}$ is one if at most 20 provisions are covered.
- Desta database provided by Dür et al. (2014), covers only seven policy areas
  - $deep_{ijt}$ equals one if the depth-index is larger than three and zero otherwise
  - $shallow_{ijt}$ is one if at most three areas are covered.

Data

Depth of Trade Agreements

- World Bank's Deep Trade Agreement Dataset (DTA data) provided by Hofmann et al. (2019).
  - codifies 52 provisions and distinguishes them across their legal enforceability
  - $deep_{ijt}$ equals one if a trade agreement covers more than 20 provisions and zero otherwise
  - $shallow_{ijt}$ is one if at most 20 provisions are covered.
- Desta database provided by Dür et al. (2014), covers only seven policy areas
  - $deep_{ijt}$ equals one if the depth-index is larger than three and zero otherwise
  - $shallow_{ijt}$ is one if at most three areas are covered.
- All trade agreements that are not covered by the DTA data or Desta, are classified as shallow.

Back: Data

MFN Openness

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst} + Glob_{ijt} + \gamma MFNOpenness_{ijt}] + \epsilon_{ijst}.$$

MFN Openness

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst} + Glob_{ijt} + \gamma MFNOpenness_{ijt}] + \epsilon_{ijst}.$$

- 12 MFN provisions, i.e., changes that are made due to RTA will also benefit other trade partners
  - Baldwin et al. (2009) and Mattoo, Mulabdic, et al. (2022)
  - i.e., modernization of customs procedures, reforms of state aid
- $MFNOpenness_{ijt} = \sum_{p=0}^{12} \max(MFNProvision_{it}^{p}) \times international_{ij}$
  - can take values from 0 to 12
  - only counts the first time an RTA contains a specific MFN provision

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The Role of Omitted Variables: Tariffs and Globalization

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst} + Glob_{ijt} + \gamma MFNOpenness_{ijt}] + \epsilon_{ijst}.$$

	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) Glob	(6) MFN	(7) Glob-MFN
Deep TAs	0.25***	0.21**	0.14	0.15*	0.08	0.07	0.06
	(0.10)	(0.09)	(0.09)	(0.08)	(0.06)	(0.07)	(0.07)
Shallow TAs	0.02	-0.01	-0.07	-0.06	-0.01	-0.04	-0.01
	(0.10)	(0.10)	(0.10)	(0.09)	(0.07)	(0.08)	(0.07)
Enabl. Clause	0.05	0.04	0.00	0.00	0.04	0.03	0.05
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.06)
$ln(1+\tau)$		-1.08*	-2.99***	-2.90***	-1.22*	-1.65***	-0.98**
		(0.59)	(0.81)	(0.84)	(0.63)	(0.60)	(0.50)
MFN Openness						0.04***	0.01
						(0.01)	(0.01)
N	474312	360522	360522	474312	474312	474312	474312

Note: All columns include importer-sector-time, exporter-sector-time, importer-exporter-sector fixed effects. Standard errors are clustered threeway for importer, exporter, and year. To measure depth we follow Hofmann et al. (2019) (all provisions), the trade data include three broad sectors (agriculture, manufacturing, services) for the years 2000 to 2015 and are put together by Borchert et al. (2020).

Interaction Services

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \gamma deep_{ijt} \times services_s + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst} + Glob_{ijt}] + \epsilon_{ijst}.$$

	All Provisions				Leg. Enforcable Prov.				Desta			
	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) No Tariffs	(6) WITS	(7) New GTD	(8) New GTD	(9) No Tariffs	(10) WITS	(11) New GTD	(12) New GTD
Interaction with Services, (FE: i-k-t, j-k-t, i-j-k)												
Deep TAs	0.08	0.06	0.00	0.03	0.08	0.03	-0.04	0.03	0.10	0.10	0.06	0.07
	(0.07)	(0.06)	(0.05)	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)	(0.08)	(0.07)	(0.07)	(0.08)
Services × deep	0.24	0.28**	0.33***	0.27*	0.18	0.27**	0.33**	0.22	-0.04	-0.01	0.04	0.02
	(0.16)	(0.13)	(0.13)	(0.15)	(0.17)	(0.13)	(0.13)	(0.16)	(0.15)	(0.14)	(0.15)	(0.16)
Shallow TAs	0.02	0.02	-0.02	-0.01	0.04	0.05	0.01	0.01	-0.05	-0.06	-0.10*	-0.10**
	(0.08)	(0.08)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.05)
Enabl. Clause	0.06	0.03	-0.00	0.03	0.06	0.03	0.01	0.04	0.06	0.03	-0.00	0.02
	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)
$ln(1+\tau)$		-0.18	-1.75***	-1.43**		-0.17	-1.76***	-1.38**		-0.16	-1.66**	-1.78**
		(0.50)	(0.61)	(0.61)		(0.50)	(0.65)	(0.62)		(0.50)	(0.65)	(0.70)
N	474,312	340,221	340,221	474,312	474,312	340,221	340,221	474,312	474,312	340,221	340,221	474,312

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Interaction G7

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \gamma deep_{ijt} \times G7_{ij} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst} + Glob_{ijt}] + \epsilon_{ijst}.$$

	All Provisions				Leg. Enforcable Prov.				Desta			
	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) No Tariffs	(6) WITS	(7) New GTD	(8) New GTD	(9) No Tariffs	(10) WITS	(11) New GTD	(12) New GTD
Interaction with G7 Countries, (FE: i-k-t, j-k-t, i-j-k)												
Deep TAs	0.11	0.13	0.09	0.08	-0.03	-0.01	-0.07	-0.08	0.03	0.07	0.03	0.01
	(0.09)	(0.09)	(0.08)	(0.08)	(0.06)	(0.05)	(0.04)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
G7 × deep	0.01	0.01	0.00	0.01	0.16**	0.15*	0.16**	0.17**	0.10	0.04	0.05	0.09
	(0.10)	(0.11)	(0.11)	(0.11)	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)	(0.09)
Shallow TAs	0.02	-0.00	-0.04	-0.01	0.04	0.03	-0.00	0.01	-0.05	-0.05	-0.10	-0.10
	(0.08)	(0.08)	(0.08)	(0.07)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)
Enabl. Clause	0.06	0.03	0.01	0.04	0.05	0.02	0.00	0.04	0.05	0.02	-0.00	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$ln(1+\tau)$		-0.12	-1.46**	-1.22*		-0.12	-1.45**	-1.23*		-0.17	-1.61**	-1.73**
		(0.51)	(0.69)	(0.63)		(0.51)	(0.70)	(0.63)		(0.52)	(0.67)	(0.69)
N	474,312	340,221	340,221	474,312	474,312	340,221	340,221	474,312	474,312	340,221	340,221	474,312

Interaction G7

$$X_{ijst} = exp[-\sigma\ ln(1+\tau_{ijst}) + \beta_1 deep_{ijt} + \gamma deep_{ijt} \times G7_{ij} + \beta_2 shallow_{ijt} + \beta_3 EnCl_{ijt} + \mu_{ijs} + \nu_{ist} + \nu_{jst} + Glob_{ijt}] + \epsilon_{ijst}.$$

	All Provisions				Leg. Enforcable Prov.				Desta			
	(1) No Tariffs	(2) WITS	(3) New GTD	(4) New GTD	(5) No Tariffs	(6) WITS	(7) New GTD	(8) New GTD	(9) No Tariffs	(10) WITS	(11) New GTD	(12) New GTD
Interaction with G7 Countries, (FE: i-k-t, j-k-t, i-j-k)												
Deep TAs	0.11	0.13	0.09	0.08	-0.03	-0.01	-0.07	-0.08	0.03	0.07	0.03	0.01
	(0.09)	(0.09)	(0.08)	(0.08)	(0.06)	(0.05)	(0.04)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)
G7 × deep	0.01	0.01	0.00	0.01	0.16**	0.15*	0.16**	0.17**	0.10	0.04	0.05	0.09
	(0.10)	(0.11)	(0.11)	(0.11)	(0.07)	(0.08)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)	(0.09)
Shallow TAs	0.02	-0.00	-0.04	-0.01	0.04	0.03	-0.00	0.01	-0.05	-0.05	-0.10	-0.10
	(0.08)	(0.08)	(0.08)	(0.07)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.07)
Enabl. Clause	0.06	0.03	0.01	0.04	0.05	0.02	0.00	0.04	0.05	0.02	-0.00	0.01
	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)	(0.06)
$ln(1+\tau)$		-0.12	-1.46**	-1.22*		-0.12	-1.45**	-1.23*		-0.17	-1.61**	-1.73**
		(0.51)	(0.69)	(0.63)		(0.51)	(0.70)	(0.63)		(0.52)	(0.67)	(0.69)
N	474,312	340,221	340,221	474,312	474,312	340,221	340,221	474,312	474,312	340,221	340,221	474,312

No significant effects for interaction with high-income countries, EU or US.

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