Trade Retaliation with Temporary Trade Barriers

AEA MEETINGS

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Motivation

- Over the past seventy years, GATT/WTO multilateral processes have reduced average tariffs below 3% … but Temporary Trade Barriers (TTBs) have increased over time.

- Are TTBs used “to protect specific industries in exceptional circumstances” as allowed by the WTO? Or are they used instead for other, strategic, reasons?

- Existing empirical evidence on retaliation has been inconclusive—we argue because of identification problems. Makes it difficult to ascertain whether TTBs are used in case of material injury to a sector; or more broadly whether they are being used in circumstances allowed by WTO.

- If TTB use is more pervasive and goes against the grain of multilateral rules, speaks to broader problems with global trade system.

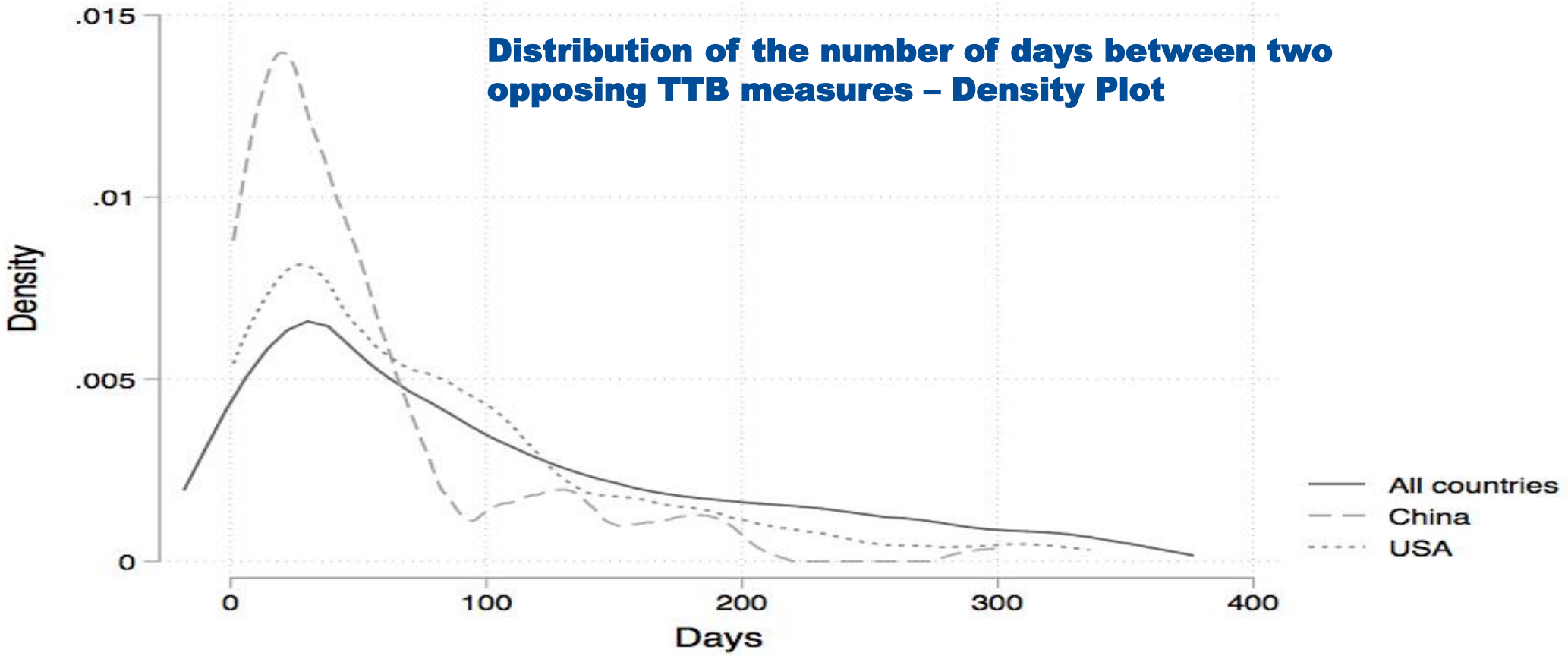
Knowns and Unknowns

- We know (Bown and Crowley, 2013) that TTBs respond to macro conditions—casts some *prima facie* doubt on multilateral rules unless macro and sectoral harm are strongly correlated.
- But we don't know what drives the plethora of TTBs that follow in time TTBs imposed by trade partner *within a year*.
- We don't have a good way to handle endogeneity either; or intensity; we don't have an easy way to distinguish sectoral versus aggregate drivers of TTB use.
- We need both more granular data than has been used to date in the literature; and an identification strategy that is promising for answering these questions.

Problem 1: Within-Year TTB Responses are Pervasive

Dummy variable that takes the value of one if TTB filed by country *r* against *i* and country *i* had in previous years filed against *r* ➔ Problem: **Most actions occur within a year**.

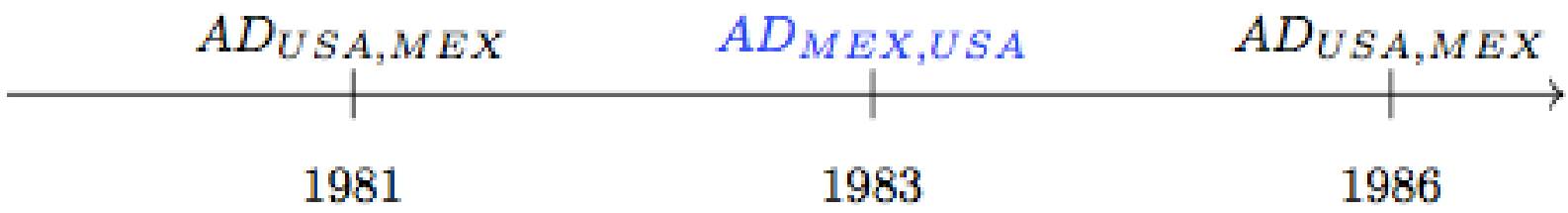
Distribution of the number of days between two opposing TTB measures – Density Plot



Source: Temporary trade barriers database. Kernel density.

Problem 2: Endogeneity

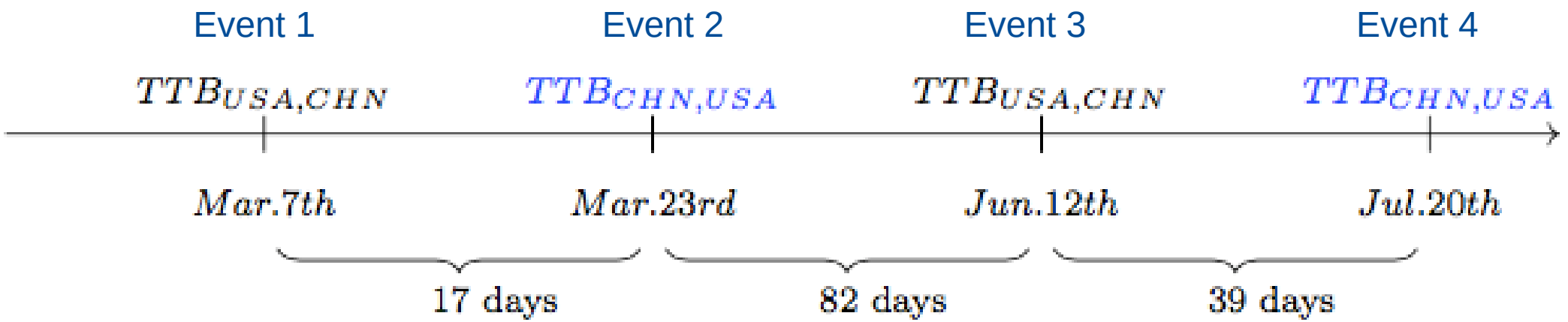
Dummy variable that takes the value of one if country *i* has ever filed a TTB against *r* prior to year t (or t-1)➔ **Endogeneity**.



- AD introduced by Mexico in 1983 considered when examining retaliation of USA in 1986, but both measures endogenous to AD introduced by USA in 1981.

An Identification Strategy

Timeline of new investigations between China and the US in 2012



Step 1. Calculate country-specific thresholds: median number of days for China (USA) to introduce a TTB following TTBs introduced in its trading partners → China median response 38 days; USA median response 64 days

Step 2. China retaliatory TTBs: March 23 event qualifies given median threshold; July 20 event does not

- → **17 days < 38 days median => counts as retaliatory action.**
- → **39 days > 38 days median => does not count as retaliatory action.**

USA retaliatory TTBs: Action on July 20 does not qualify as retaliation

- → **82 days > 64 days median => does not count as retaliatory action.**

Implementation

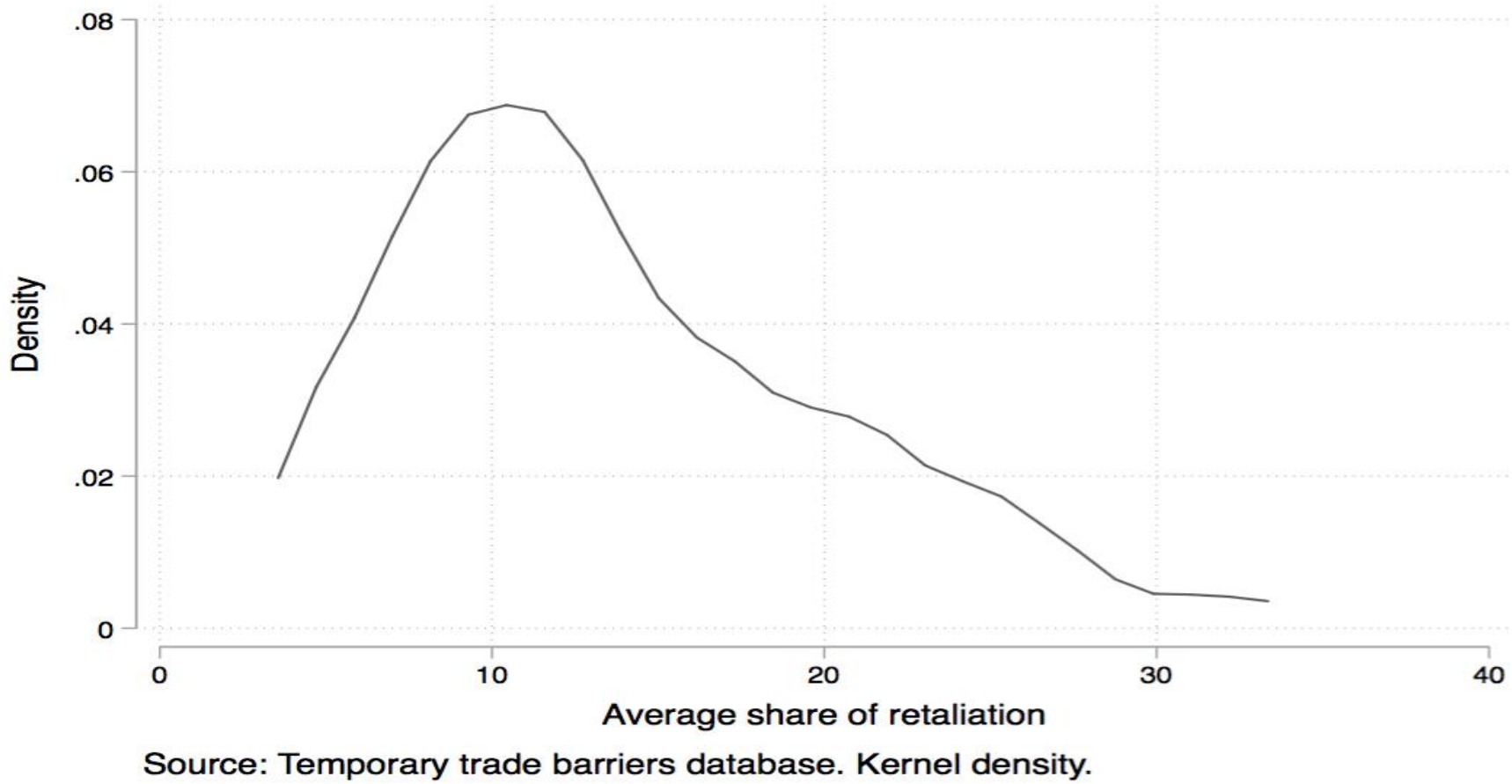
Approach: Trade retaliation is defined as the number of new HS6–digit-product actions by country *r* against *i* which are launched up to *x* days after an action by country *i* on country *r*, where *x* is country *r*'s median number of days to respond to a foreign measure (across all *i*).

Types of TTBs: Antidumping duties (AD), countervailing duties (CV), global safeguards (GS), China-specific safeguards (CS). Time coverage 1970-2015.

TTB dataset (Bown, 2015): Daily data on each measure, reports exact day a new investigation has been launched by country *r* on country *i* on a product (HS8 or even HS10 level available).

Advantages: Daily data, sectoral data, country data and identification strategy with time-invariant country specific thresholds for retaliation (and robust to alternative thresholds). Specifically: can deal with within-year retaliation; sectoral versus macro retaliation; can control for macro and sectoral shocks that vary through time.

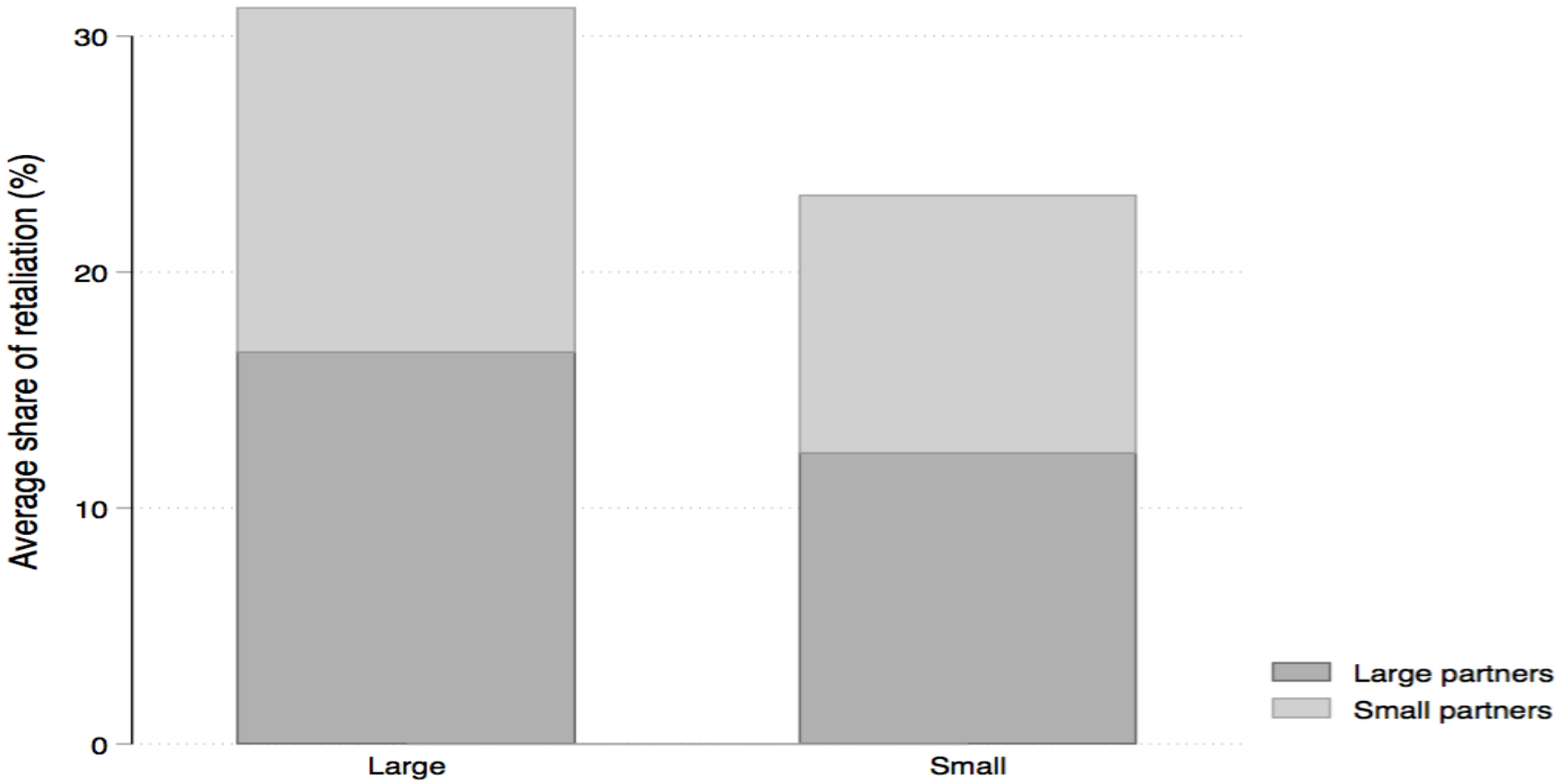
Fact 1: Retaliatory TTBs 10% of total, but wide variation



Source: Temporary trade barriers database. Kernel density.

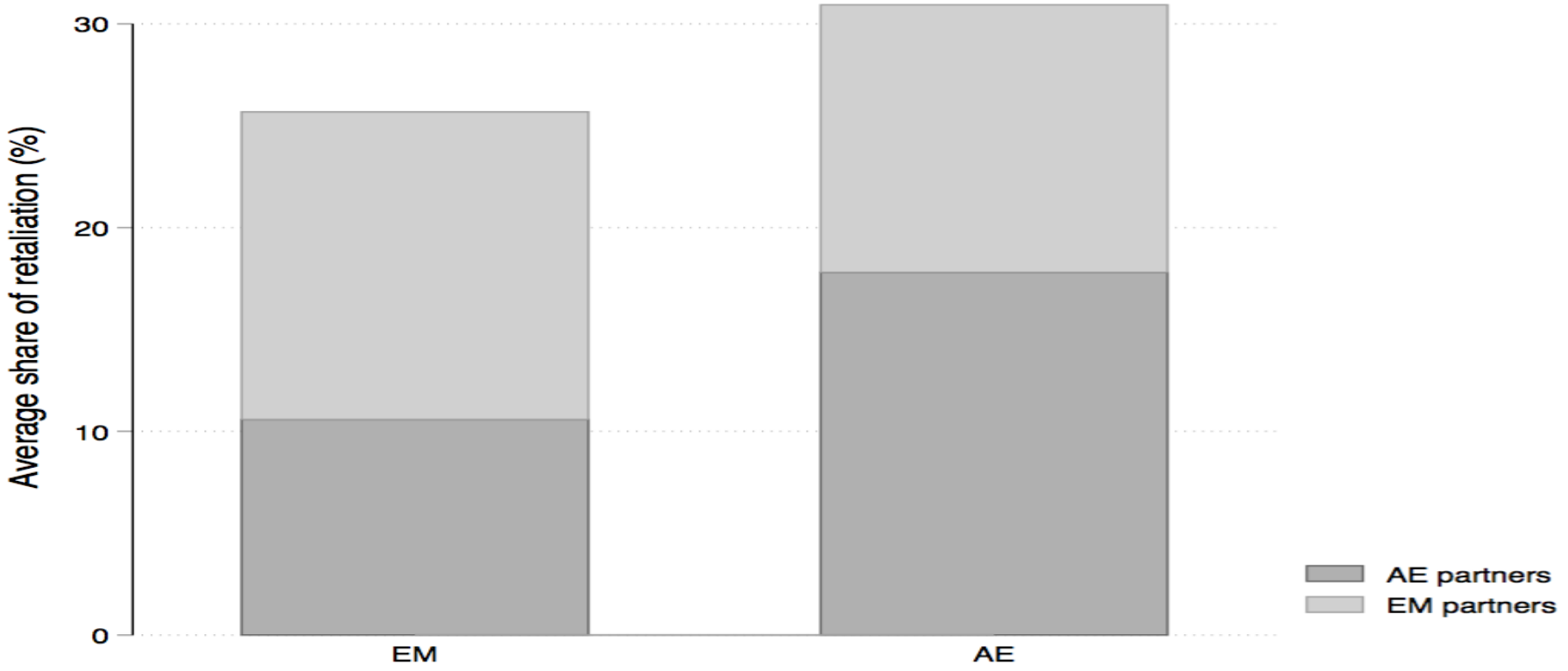
Notes: The figure plots the distribution of the average share of retaliation computed for each country as the share of retaliatory investigations out of total number of new investigations.

Fact 2: Retaliation less frequent in small countries



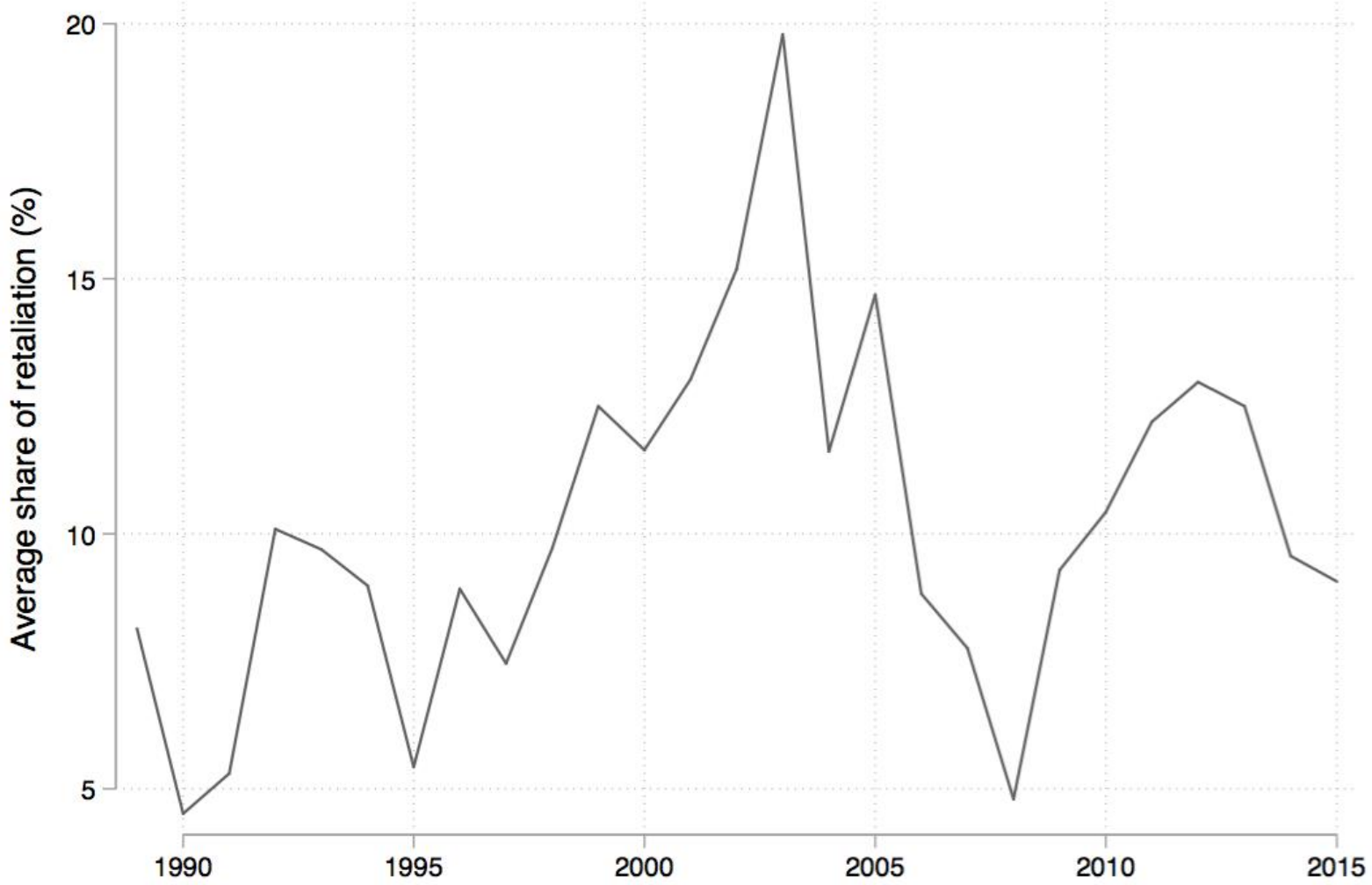
Notes: We compute for each country the share of investigations identified as potential retaliation out of the total number of new investigations. Large (small) importers defined as those with average imports above sample median.

Fact 3: Emerging Markets Less Frequent Retaliators



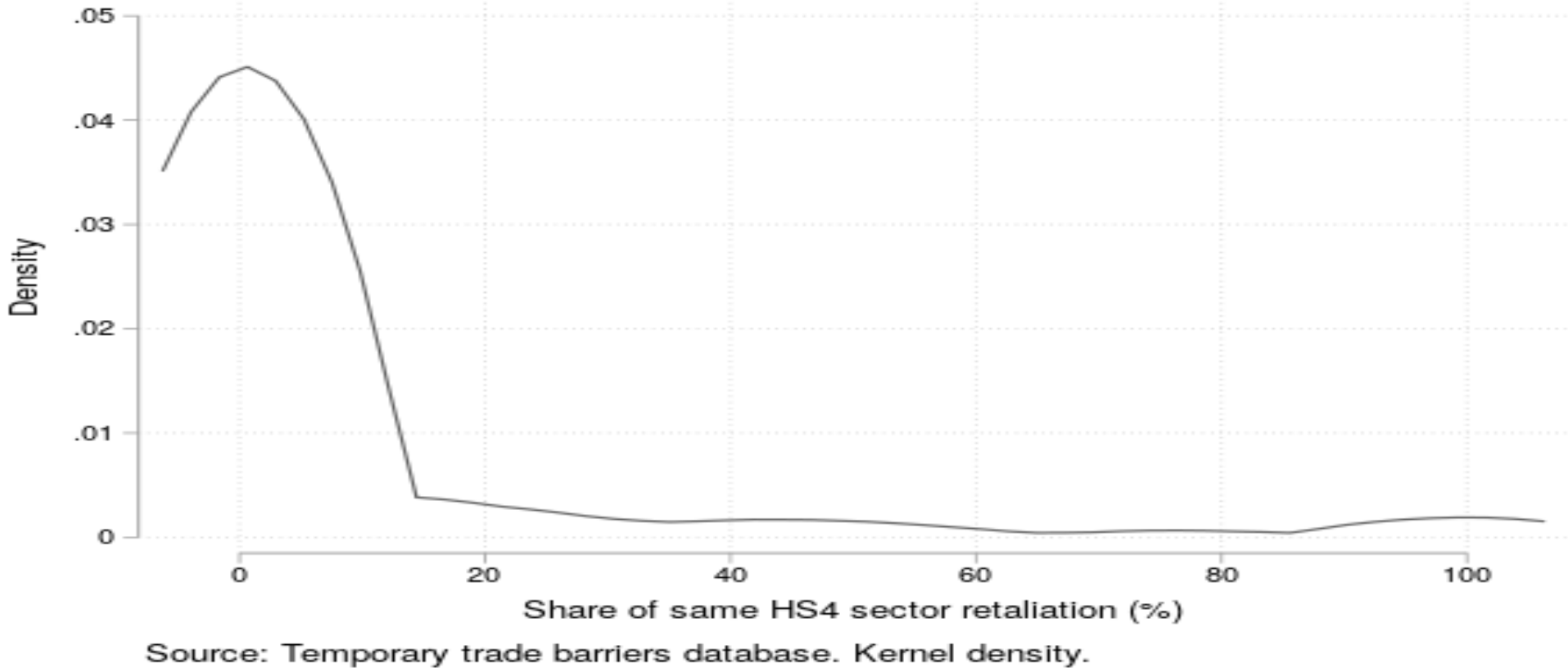
Notes: The figure plots the distribution of the average share of retaliation. We compute for each country the share of investigations identified as potential retaliation out of the total number of new investigations. AE (EM) classification is based on IMF.

Fact 4: Retaliation peaks in early 2000s & post-GFC



Notes: Figure plots average share of retaliatory to total TTBs.

Fact 5: Retaliation occurs mainly *across* sectors



Source: Temporary trade barriers database. Kernel density.

Notes: We examine within a country-pair *ri*, which sectors are generally targeted by *i*, and which sectors *r* generally retaliates to. We compute for each sector, within each dyad, how many times a specific sector is targeted by country *i*, and how many times country *r* retaliates in this same sector, and then aggregate this sectoral retaliation at the country-pair level. The figure plots the distribution of same HS4-sector retaliation.

Empirical Framework: Baseline

$$TTB_{rik,t} = \beta_1 TTB_{irk,x} + \beta_2 TTB_{irk',x} + \theta' \mathbf{Z}_{ri,t-1} + \alpha_{rt} + \delta_{it} + \gamma_{st} + \mu_{ri} + v_{rik,t}$$

Dependent variable and controls:

- Count of HS-6 imported products aggregated at HS4 sector *k* on which the government of economy *r* conducts a new temporary trade barrier investigation against trading partner *i* in year *t.* Non-negative count data, which exhibits over-dispersion in that the variance of the number of investigations per time period exceeds the mean.

- Macro control variables ***Z***: imports; RER; trade balances and X shares; tariff levels, changes, overhang (diff bound & applied tariffs); comparative advantage indicator; full array dummies.

Estimator:

- Pseudo-Poisson Maximum Likelihood estimations, following Silva and Tenreyro (2006, 2011).
- Retaliation coefficients are semi-elasticities: percent change for unit change in regressor.

Empirical Framework: Interactions

$$TTB_{rik,t} = \beta_1 TTB_{irk,x} + \beta_2 TTB_{irk\prime,x} + \theta' \boldsymbol{Z}_{ri,t-1} + \\ + \beta_3 TTB_{irk,x} \boldsymbol{M}_{ri,t-1} + \beta_4 TTB_{irk\prime,x} \boldsymbol{M}_{ri,t-1} + \\ + \alpha_{rt} + \delta_{it} + \gamma_{st} + \mu_{ri} + v_{rik,t}.$$

Covariates:

- Our measure of retaliation differentiated between responses to measures introduced in sector *k* ($TTB_{irk,x}$) and other sectors *k'* ($TTB_{irk\prime,x}$).
- Macro control interactions: can test whether retaliation is more common under certain macro conditions or structural features (high unemployment; large versus small countries).
- Trade policy controls: changes in applied tariffs, level of tariff overhang, dummies for the existence of trade agreement in the dyad, and indicating whether sector *k* is a comparative advantage sector of country *r* or *i*.
- Fixed effects: μ_{ri} is a country-pair fixed effect to control for unobservable characteristics such as cultural ties, distance, etc; α_{rt} and δ_{it} are time-varying country-specific factors to account for macroeconomic shocks in the domestic and foreign economy (e.g. changes in real GDP and unemployment); γ_{st} are sector-time varying fixed effects to account for sectoral specific trends (increased global protection in specific sectors, such as IT).

Baseline results

	Dependent variable: TTB_rikt				
	(1)	(2)	(3)	(4)	(5)
TTB_irkt	**0.0726****	**0.0991*****	**0.0710****	**0.0761****	**0.119*****
	(0.0308)	**(0.0301)**	**(0.0309)**	**(0.0361)**	**(0.0304)**
TTB_irk't	**0.0582*****	**0.0562*****	**0.0590*****	**0.0662*****	**0.0656*****
	(0.00360)	**(0.00413)**	**(0.00379)**	**(0.00471)**	**(0.00510)**
ΔImports_rik,t-1	-2.48e-06	-2.19e-06	-2.41e-06	-0.000116	-0.000125
	(7.43e-06)	(1.23e-05)	(7.36e-06)	(0.000106)	(0.000145)
ΔRER_ri,t-1	-0.0317*	-0.0481**	-0.0282	-0.0327	-0.0435
	(0.0179)	(0.0222)	(0.0192)	(0.0294)	(0.0328)
RTA_ri,t-1		-0.0477			0.122
		(0.158)			(0.181)
Overhang* ΔTariff_rik,t-1		-0.000235***			-0.000129
		(6.00e-05)			(0.000131)
ΔTariff_rik,t-1		-0.00160			0.0134***
		(0.00736)			(0.00447)
Overhang_rik,t-1		-0.00774***			-0.0115***
		(0.00217)			(0.00441)
Disputes_ri,t-1		0.177*			0.109
		(0.105)			(0.122)
Trade balance_ri,t-1			-0.0122		0.0206
			(0.0302)		(0.0469)
Total Imports_ir,t-1			-1.534**		-0.987
			(0.625)		(0.798)
Export share_ri,t-1			-0.916		-3.180*
			(1.074)		(1.685)
CA_rk				-0.239***	-0.182***
				(0.0471)	(0.0545)
CA_ik				0.539***	0.546***
				(0.0438)	(0.0496)
One SD TTB_irkt	**0.00126**	**0.00172**	**0.00123**	**0.00132**	**0.00207**
One SD TTB_irk't	**0.02193**	**0.02118**	**0.02223**	**0.02495**	**0.02472**
Observations	2,327,948	1,521,702	2,275,699	1,448,765	948,797
FE rt-it-ri-st	Yes	Yes	Yes	Yes	Yes
Cluster	rik	rik	rik	rik	rik

Notes: Standard errors are in parenthesis and clustered at the country-pair-hs4 sector dimension (*rik)*, and significance levels are defined such as *** p<0.01, ** p<0.05, * p<0.1. Each estimation contains both country-time (*rt* and *it*), country-pair (*ri*) and HS2 sector-time (*st*) fixed effects.

Robustness checks

	(1) OLS	(2) Import coverage	(3) AD only	(4) 25th percentile threshold	(5) Whole sample median threshold	(6) Time-varying threshold
TTB_irkt	**0.539*** **		**1.314*** **	**0.124*** **	**0.128*** **	**0.118*** **
	(0.132)		**(0.206)**	**(0.0312)**	**(0.0213)**	**(0.0303)**
TTB_irk't	**0.0497*** **		**0.340*** **	**0.0531*** **	**0.0697*** **	**0.0665*** **
	(0.0131)		**(0.0931)**	**(0.00441)**	**(0.00529)**	**(0.00515)**
Targeted export share_rikt		**-1.282*** **				
		(0.109)				
Targeted export share_rik't		**1.315*** **				
		(0.109)				
Observations	2,426,420	1,855,008	734,859	948,797	948,797	948,797
R-squared	0.065	0.044				
FE rt-it-ri-st	Yes	Yes	Yes	Yes	Yes	Yes
Cluster	rik	rik	rik	rik	rik	rik

Notes: Standard errors in parenthesis clustered at the country-pair-hs4 sector dimension (*rik)*, and significance levels defined such that *** p<0.01, ** p<0.05, * p<0.1. Estimation contain both country-time (*rt* and *it*), country-pair (*ri*) and HS2 sector-time (*st*) fixed effects. Controls included but not reported.

Comparison with existing measures: Granularity Reveals Larger and More Precise Impacts

	HS4 sector-level data		Bilateral-level data	
	(1)	(2)	(3)	(4)
TTB_irkt	**0.119*** **			
	(0.0304)			
TTB_irk't	**0.0658*** **			
	(0.00506)			
TTB_irk,t-1		**-0.0678**		
		(0.238)		
TTB_irk',t-1		**0.0473*** **		
		(0.00499)		
TTB_ijxt			**0.00900** **	
			(0.00455)	
TTB_ij,t-1				**-0.000457**
				(0.00232)
Observations	948,797	948,797	6,574	6,574
FE rt-it-ri-st	Yes	Yes	Yes	Yes
Cluster	rik	rik	ri	ri

Notes: Standard errors are in parenthesis and clustered at the country-pair-hs4 sector dimension (*rik)*, and significance levels are defined such as *** p<0.01, ** p<0.05, * p<0.1. Each estimation contains both country-time (*rt* and *it*), country-pair (*ri*) and HS2 sector-time (*st*) fixed effects. In column (2) the variables of interest are the one-year lagged total number of new investigations launched by country *i* on country *r* in sector *k.* Columns (3) and (4) report estimates from the same exercises but at the bilateral level only. Controls included but not reported.

Non-linearities (Macro Interactions)

	(1)	(2)
TTB_ijx	**0.00775****	**0.0124*****
	(0.00356)	**(0.00257)**
TTB_ijx*ΔTariff_rik,t-1		**-0.000652****
		(0.000272)
TTB_ijx*HighU_rt	**0.00957****	
	(0.00475)	
Observations	653,895	715,530
FE rt-it-ri-st	Yes	Yes
Cluster	rik	rik

Notes: Standard errors in parenthesis clustered at the country-pair-hs4 sector dimension (*rik);* significance levels defined *** p<0.01, ** p<0.05, * p<0.1. Estimations contain both country-time (*rt* and *it*), country-pair (*ri*) and HS2-sector-time (*st*) fixed effects. Controls included but not reported.

Summary & Conclusions

Are TTBs used by countries as a means of retaliation? YES!

- New data; new identification strategy; new results.
- Wide dispersion across countries in the extent of reliance on TTBs for retaliation, with some using up to 30% of TTBs for retaliation purposes; smaller countries retaliating the least.
- Retaliation using TTBs has increased over time, peaking in the early 2000s.
- Retaliatory TTBs are not in general tailored to a single injured sector; retaliation also tends to occur in many sectors at the same time.
- Larger retaliation effects during periods of weaker economic activity.

Additional Slides

Country specific thresholds

Country	Median response	Country	Median response
ARG	137	MEX	108
AUS	198	MYS	423
BRA	125	NZL	423
CAN	177.5	PAK	315.5
CHL	155	PER	450
CHN	38	PHL	302
COL	454	RUS	443
CRI	426.5	THA	192.5
EUN	80	TUR	126
IDN	87	TWN	140
IND	60	USA	64
ISR	523	VEN	204
JPN	289	ZAF	288.5
KOR	76.50	Whole sample	116.5

Descriptive Statistics

	Mean	Standard deviation	Min	Max
TTB_rikt	.0091587	.2304509	0	27
TTB_irkt	.0000374	.0173776	0	14
TTB_rrk'≠k,t	.0025834	.3768482	0	172
Import growth_rik,t-1	63.64118	26783.17	-1	3.49e+07
RER var._ri,t-1	1.066357	15.03087	-85.72816	325.2191
Trade balance_ri,t-1	.1899252	1.601127	-8.557683	13.04149
Export share_ri,t-1	.0778474	.1333898	2.01e-06	.843114
Tariff_rik,t-1	6.603454	9.230103	0	813.58
Overhang,rik,t-1	12.29513	14.32947	-358.69	730.25
Tariff var._rik,t-1	.4845666	4.647727	-808.01	774.34
Tariff var. irk,t-1	.5215413	4.392807	-530.1	547.45
Disputes_ri,t-1	.0075315	.1043255	0	3
N. of observations	**2,327,948**			