Political Affinity and the Stumbling Block Puzzle:
Evidence from Antidumping

Xiaohua Bao[1] Joseph Mai[1] Xiaozhuo Wang[2]

[1]College of Business, Shanghai University of Finance and Economics
xhbao369@mail.shufe.edu.cn Josephm@mail.shufe.edu.cn

[2]Shanghai University of Political Science and Law
475789627@qq.com

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The Puzzle: FTAs and External Protection

Stumbling Block

- Limão (2006, *AER*): US MFN tariffs declined less in PTA-bound products
- Prusa–Teh (2010): Extra-PTA AD up 10–30%
- Karacaovali–Limão (2008)
- Bown–Tovar (2016): Mercosur

Building Block

- Estevadeordal–Freund–Ornelas (2008, *QJE*): FTAs lower MFN tariffs
- Tovar (2019, 2021): developing countries
- Ornelas (2005): endogenous FTA formation
- Crivelli (2016)

The puzzle: How can the same institutional arrangement (FTAs) produce opposite effects on external protection? Can both sides be right?

Why Antidumping?

- **Most frequently invoked trade remedy** worldwide
- **Discretionary**: governments can adjust without violating WTO bound tariffs
- MFN tariffs are constrained by multilateral negotiations
  $\Rightarrow$ **AD is the margin of adjustment**
- Bown & Tovar (2016): "building block" evidence from tariff data **disappears** once AD and safeguards are included
- Prusa, Teh & Zhu (2022): AD diversion patterns differ systematically across FTA partnerships

"Looking only at MFN tariffs gives an incomplete picture."

Our Argument: Political Affinity Is the Missing Variable

Prior work treats all FTA partnerships as homogeneous (a binary dummy).
But political relationships are **profoundly heterogeneous**.

High affinity ($\varphi_r \to 1$):

- US–Canada (USMCA)
- France–Germany (EU)
- Voting alignment, defense treaties
- $\Rightarrow$ Stumbling block

Low affinity ($\varphi_r \to 0$):

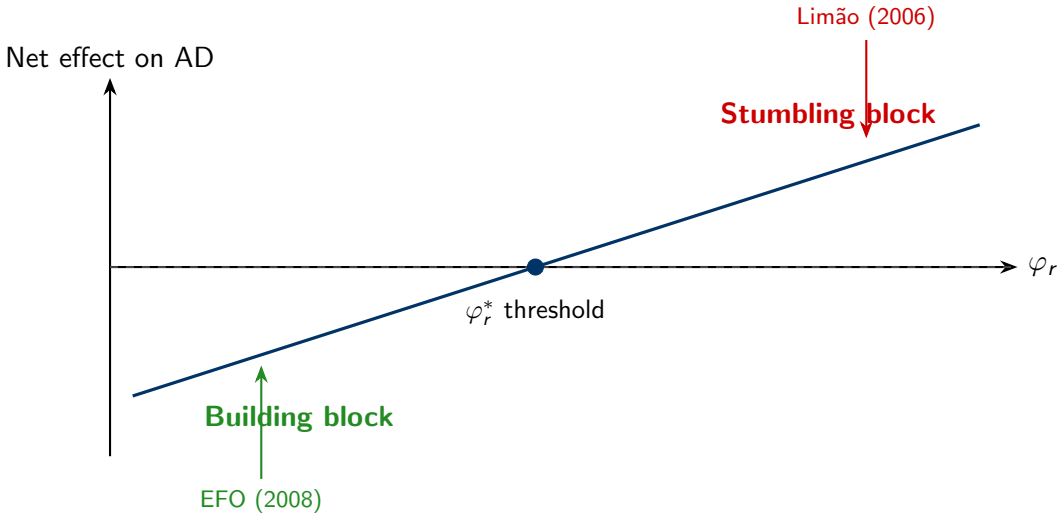
- Early MERCOSUR
- Some ASEAN pairs
- Geographic proximity, limited coordination
- $\Rightarrow$ Building block

$\varphi_r \in [0, 1]$ determines the sign $\Rightarrow$ **reconciles the literature**

Preview of Results

1. **Theory**: φ_r determines whether FTAs are stumbling blocks or building blocks
   - Proposition 3 reconciles Limão (2006) vs. EFO (2008)
2. **Empirics**: Heterogeneity modulated by import demand elasticity $|\varepsilon|$
   - High $|\varepsilon|$: $\hat{\beta}_3 = 0.370$ (stumbling block)
   - Low $|\varepsilon|$: $\hat{\beta}_3 = -0.135^{*}$ (building block)
   - Interaction coefficient: 0.505^{***} ($p < 0.01$)
   - Wald test for heterogeneity: $p = 0.053$
3. **Welfare**: Stumbling blocks concentrate where protection is costliest
   - Calibrated Canada–US–China EV case: **CAD $1.06 billion/year**

Contribution: Reconciling the Literature



Limão (2006) and EFO (2008) can **both** be right – for different FTA

Contribution: Political Economy & Geopolitics

Political economy of trade policy:

- Extends "protection for sale" (Grossman–Helpman, 1994) to the FTA context
- Partner-specific weights φ_r capture bilateral political relationships
- Endogenous AD as the margin of adjustment (vs. MFN tariffs)

Geopolitical alignment & trade policy:

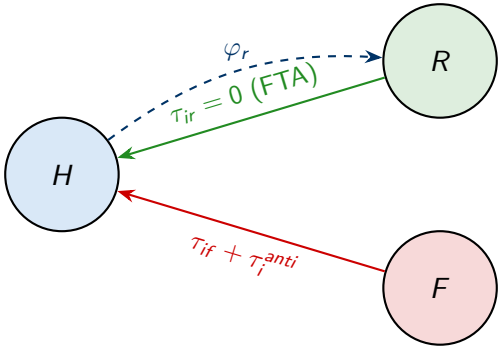
- Connects to Becko–Grossman–Helpman (2025), Bonadio et al. (2025)
- φ_r captures both altruistic internalization and strategic compliance
- Welfare costs of "tariff synchronization" across asymmetric partners

Roadmap

- **Model**: 3 propositions (tariff complementarity, coordination, net effect)
- **Empirical**: IV estimation, baseline, heterogeneity, robustness
- **Welfare**: DWL decomposition, Canada–US–China EV calibration
- **Conclusion**: Summary, limitations, future work

Model: Setup

- **Three country groups**: Home (H), FTA Partners (R), Non-members (F)
- Monopolistic competition, differentiated products, CES preferences
- $N + 1$ industries: one numeraire (freely traded), N differentiated
- n_{ij} firms from country j compete in Home market i



Preferences and Demand

Quasi-linear upper-tier utility:

$$U = X_0 + \sum_{i=1}^{N} \alpha_i \ln X_i$$

CES sub-utility in industry i:

$$X_i = \left(\sum_j n_{ij}\, d_{ij}^{1/\sigma_i}\, x_{ij}^{(\sigma_i-1)/\sigma_i} \right)^{\sigma_i/(\sigma_i-1)}$$

Demand:

$$x_{ij} = \alpha_i\, d_{ij}\, p_{ij}^{-\sigma_i}\, P_i^{\sigma_i-1}$$

Two key parameters: σ_i (substitution elasticity) and ε_{if} (import demand elasticity)
Under CES: $\varepsilon_{if} = \sigma_i - (\sigma_i - 1)\, s_{if}$

Government Objective

Without FTA coordination:

$$G(\tau) = \underbrace{CS(\tau)}_{\text{consumer surplus}} + \underbrace{TR(\tau)}_{\text{tariff revenue}} + \underbrace{\sum n_{iH}\pi_{iH}(\tau)}_{\text{domestic profits}}$$

Optimal AD without FTA (inverse elasticity rule):

$$\varepsilon_{if} \cdot \tau_i^{anti*} = \frac{\sigma_i - 1}{\sigma_i} \cdot s_{iH}$$

- AD is **increasing** in domestic market share s_{iH} (profit-shifting)
- AD is **decreasing** in import demand elasticity ε_{if} (distortion cost)
- Standard optimal tariff logic (Broda–Weinstein 2006)

The Key Innovation: Political Affinity in the Objective

With FTA coordination — add partner profits weighted by φ_r:

$$G(\tau) = CS(\tau) + TR(\tau) + \sum n_{iH}\pi_{iH}(\tau) + \sum_r \varphi_r \cdot n_{ir} \cdot \pi_{ir}(\tau)$$

- $\varphi_r \in [0, 1]$: weight Home places on partner r's export profits
- $\varphi_r = 0$: no coordination $\Rightarrow$ FTA has no effect via this channel
- $\varphi_r = 1$: full internalization $\Rightarrow$ partner firms treated as domestic

This single parameter φ_r is doing all the work.
Everything else is standard CES monopolistic competition.

Equilibrium AD Under FTA: The Main Equation

$$\varepsilon_{if} \cdot \tau_i^{anti*} = \underbrace{\frac{\sigma_i - 1}{\sigma_i} \cdot s_{iH}}_{\text{Term 1: Domestic share}} + \underbrace{(\sigma_i - 1) \sum_r \tau_{ir}\, s_{ir}}_{\text{Term 2: Tariff complementarity}} + \underbrace{\frac{\sigma_i - 1}{\sigma_i} \sum_r \varphi_r (1 - \tau_{ir})\, s_{ir}}_{\text{Term 3: Tariff coordination}}$$

Term 1

Domestic market share
Same as no-FTA benchmark
$\beta_1 > 0$

Term 2

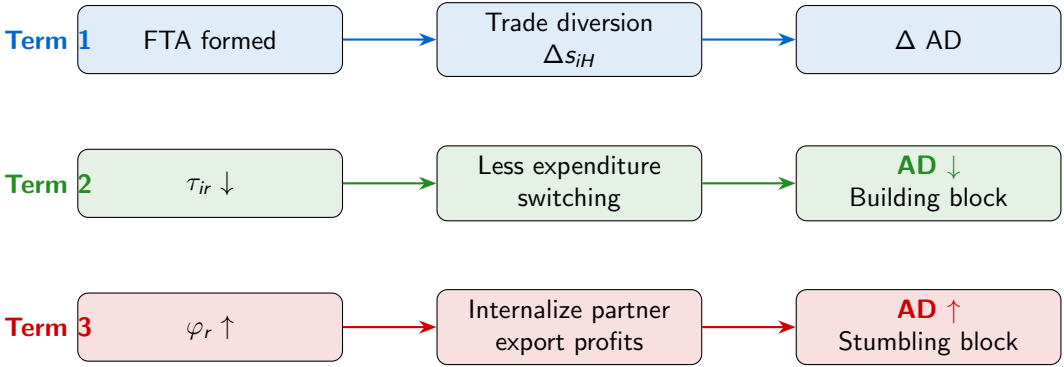
Tariff complementarity
BUILDING BLOCK
Operates $\forall \varphi_r$

Term 3

Tariff coordination
STUMBLING BLOCK
Increasing in φ_r

Equation (15) in the paper

Three Channels: Intuition



- Term 2 operates regardless of φ_r (Bagwell–Staiger 1999 pedigree)
- Term 3 is the **new contribution**: political affinity drives a stumbling block
- Net effect: Term 2 + Term 3 $\Rightarrow$ depends on φ_r

Proposition 3: The Reconciliation Result

Proposition 3 (Net Effect)

The net effect of FTA on external AD is **ambiguous**:

- When φ_r is high $\Rightarrow$ coordination dominates $\Rightarrow$ stumbling block
- When φ_r is low $\Rightarrow$ complementarity dominates $\Rightarrow$ building block

Remark: Reconciliation

Limão (2006) studies **US FTAs** (high φ_r: close allies)
EFO (2008) study **developing country FTAs** (lower φ_r: geographic proximity)

$\Rightarrow$ Both are correct for their respective samples.

We are not asking whether FTAs are stumbling blocks **or** *building blocks.*
The answer is: **both**, *depending on* φ_r.

Empirically Relevant Case: $\tau_{ir} = 0$

Under GATT Article XXIV, preferential tariffs are typically zero:

- Term 2 vanishes: $(\sigma - 1) \sum_r \tau_{ir}\, s_{ir} = 0$
- Term 3 simplifies: $(1 - \tau_{ir}) = 1$

$$\varepsilon_{if} \cdot \tau_i^{anti*} = \frac{\sigma_i - 1}{\sigma_i} \cdot s_{iH} + \frac{\sigma_i - 1}{\sigma_i} \sum_r \varphi_r\, s_{ir}$$

- Two regressors: domestic share s_{iH} and affinity-weighted partner share $\sum_r \varphi_r s_{ir}$
- Building block effect operates only through Δs_{iH} (trade diversion)
- **This is what we take to data**

Melitz Extension

Extension: Firms draw productivity from Pareto $G(\phi) = 1 - (\phi_{\min}/\phi)^k$

- Only sufficiently productive firms export: $\phi > \phi^*_{ij}$
- AD raises the export cutoff: $\partial\phi^*_{if}/\partial\tau^{anti} > 0$
  $\Rightarrow$ Eliminates least productive non-member exporters

Key results:

- Same three-term structure as Eq. (15), amplified by Pareto factor $\frac{k}{k-\sigma_i+1} > 1$
- Propositions 1–3 carry over unchanged
- **New prediction (Proposition 7):**

Proposition 7

$$\frac{\partial^2 \tau_i^{anti*}}{\partial\varphi_r\,\partial k} < 0$$

The stumbling block effect is **stronger** in industries with greater firm-level heterogeneity (lower k).

Model Summary: Testable Predictions

	Prediction	**Sign**	**Channel**
Prop. 1	$\downarrow \tau_{ir} \Rightarrow \downarrow$ AD against F	$-$	Building block
Prop. 2	$\uparrow \varphi_r \Rightarrow \uparrow$ AD against F	$+$	Stumbling block
Prop. 3	Net effect ambiguous	$\pm$	Depends on φ_r
Prop. 7	Stumbling block $\uparrow$ in firm heterogeneity	$-$ cross-deriv	Amplification

We now take these predictions to data.

Estimating Equation

Latent variable framework: $\text{AD}_{if,t} = \mathbf{1}[\tau_i^{anti*} > c_{if,t}]$ where $c_{if,t}$ is the filing cost

Linear probability model (Eq. 18a, under $\tau_{ir} = 0$):

$$\text{AD}_{if,t} = \beta_0 + \beta_1 s_{iH,t} + \beta_3 \sum_r \varphi_{r,t} s_{ir,t} + \gamma' \text{FE} + \epsilon_{if,t}$$

- $\beta_1 > 0$: domestic market share effect (Prop. 1)
- β_3: net coordination effect — **sign is the key test**
  - $\beta_3 > 0$: stumbling block dominates
  - $\beta_3 < 0$: building block dominates
- Innovation: φ_r weights partner shares instead of binary FTA dummy

Data and Sample

Data sources:

- AD initiations: GAD database
- Trade: BACI (ISIC Rev. 3)
- Political affinity: UN voting (Bailey–Strezhnev–Voeten 2017)
- Output: UNIDO INDSTAT
- Elasticities: Kee–Nicita–Olarreaga (2008)
- Gravity: CEPII

Sample:

- Period: 1990–2015
- 58 importers, 83 exporters
- 119 industries (ISIC3)
- **Non-RTA pairs only**
- $N \approx 311{,}900$
- AD initiation rate: **2.2%**

Unit of observation: (Home H, non-member f, industry i, year t)
Regressors vary at (H, i, t); outcome at (H, f, i, t)

Key Variables

Variable	Definition	Mean (SD)
$AD_{if,t}$	$\in \{0,1\}$: antidumping initiation	0.022 (0.146)
$s_{iH,t}$	$\frac{Y_{iH}}{M_i+Y_{iH}-X_{iH}}$ (domestic share)	0.993 (0.081)
$\sum_r \varphi_r s_{ir,t}$	Affinity-weighted partner share	0.003 (0.020)
σ_i	CES substitution elasticity	6.09 (9.63)
ε_{if}	Import demand elasticity (KNO 2008)	-1.09 (0.76)

- φ_r: UN voting alignment (3-category, normalized to $[0,1]$)
- Small on average but **substantial cross-sectional and time variation**

Fixed Effects

$$\text{AD}_{if,t} = \beta_1 s_{iH,t} + \beta_3 X^3_{i,t} + \underbrace{\alpha_{Hf}}_{\text{pair}} + \underbrace{\alpha_{Ht}}_{\text{imp}\times\text{yr}} + \underbrace{\alpha_{ft}}_{\text{exp}\times\text{yr}} + \underbrace{\alpha_{i_2 t}}_{\text{ISIC2}\times\text{yr}} + \epsilon_{if,t}$$

FE	**Absorbs**
Pair ($H \times f$)	Time-invariant bilateral factors
Importer $\times$ Year	Country-level policy shocks
Exporter $\times$ Year	Target-country shocks (e.g., China surge)
ISIC2 $\times$ Year	Industry-specific protection trends

Very demanding FE structure.
Identification: within-pair time-series variation in (H, i, t) *regressors.*

Identification: Two IV Strategies

Challenge: market shares are endogenous (AD $\leftrightarrow$ trade flows)

IV1: Gravity

- Gravity-predicted trade (distance, contiguity, language, colony) $\times$ year dummies
- Exclusion: geography affects AD only through trade flows
- **K-P F = 272** (strong)

IV2: Bartik (Shift-Share)

- Initial (1988) industry composition $\times$ leave-one-out global growth
- Following BHJ (2022) identification
- Exclusion: global industry growth affects AD only through market shares

- Hansen J test ($p = 0.691$) when both IVs are used: cannot reject validity
- Primary IV is gravity (not shift-share) $\Rightarrow$ AKM (2019) concern is second-order

Baseline Results: OLS vs. IV

	OLS			IV (Gravity)		
	(1)	(2)	(3)	(4)	(5)	(6)
s_{iH}	0.0066*	0.0066*	0.0027	0.0221***	−0.0006	0.0271
	(0.004)	(0.004)	(0.006)	(0.008)	(0.054)	(0.018)
$\sum \varphi_r s_{ir}$			−0.020			0.0286
			(0.023)			(0.090)
K-P F				1.25×10^6	0.51	**272**
N	313,688	313,688	313,688	311,896	311,896	311,896

- $\beta_1 > 0$: IV corrects attenuation bias ($0.007 \to 0.027$)
- $\hat{\beta}_3 = 0.029$ (positive, as Prop. 2 predicts) but SE $= 0.090$
- **Insignificant average is predicted by Proposition 3**

Why Is the Average Effect Insignificant?

This is **not** a non-result. Proposition 3 explicitly predicts ambiguity.

The insignificant average **pools heterogeneous effects**:

Stumbling block
in high-$|\varepsilon|$ industries
$(\beta_3 > 0)$

$+$

Building block
in low-$|\varepsilon|$ industries
$(\beta_3 < 0)$

$$\underbrace{\text{Weighted average}}_{\approx 0}$$

$\Rightarrow$ We need the **interaction specification** to unpack the heterogeneity.

Heterogeneity: Theoretical Motivation

From the structural equation, $|\varepsilon_{if}|$ plays a dual role:

1. **Per-unit sensitivity**: $\partial\tau^{anti}/\partial\varphi_r \propto 1/|\varepsilon_{if}|$
   $\Rightarrow$ Effect of φ_r is larger when $|\varepsilon|$ is *low*
2. **But under CES**: $\varepsilon_{if} = \sigma_i - (\sigma_i - 1)s_{if}$
   - Low $|\varepsilon| \Leftrightarrow$ high s_{if} (non-member import penetration)
   - High $s_{if} \Rightarrow$ strong tariff complementarity $\Rightarrow$ building block
3. **Net prediction**: the building block dominates in low-$|\varepsilon|$ industries, while the coordination channel dominates in high-$|\varepsilon|$ industries

Reduced-form test:

$$\text{AD}_{if,t} = \beta_1 s_{iH} + \beta_3 X^3_{i,t} + \beta_\times \cdot X^3_{i,t} \times \mathbf{1}[|\varepsilon| > \text{median}] + \text{FE} + \epsilon$$

The Key Result: Elasticity-Dependent Heterogeneity

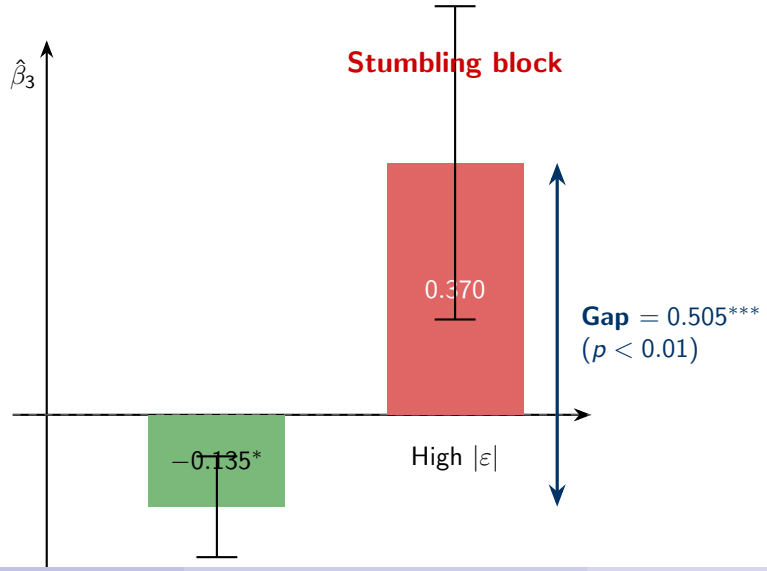
	High $\lvert\varepsilon\rvert$ (4)	**Low** $\lvert\varepsilon\rvert$ (5)	**Interaction** (6)	**Top tercile** (7)	**Bot tercile** (8)
$\sum \varphi_r s_{ir}$	0.316	-0.134^{*}	-0.135^{*}	-0.027	0.403
	(0.220)	(0.074)	(0.070)	(0.070)	(0.304)
$X^3 \times \mathbf{1}[\lvert\varepsilon\rvert > \text{med}]$			**0.505*****		
			(0.168)		
K-P F	138	145	139	112	102
N	152,640	158,223	310,957	103,305	103,761

Wald test $\hat{\beta}_3^{\text{high}} = \hat{\beta}_3^{\text{low}}$: $p = 0.053$. AR test (col 6): $p < 0.001$.

Building block in low-$\lvert\varepsilon\rvert$: $\hat{\beta}_3 = -0.135^{*}$ **Stumbling block** in high-$\lvert\varepsilon\rvert$: $-0.135 + 0.505 = \mathbf{0.370}$

Interaction 0.505^{***} ($p < 0.01$) | Strong instruments (K-P $F = 139$)

Visualizing the Heterogeneity



Robustness: Alternative Specifications

	Baseline (1)	s2un (2)	idealdiff (3)	Bartik (4)	Both IVs (5)	3-term (6)
$\hat{\beta}_3$	0.029	0.022	0.045**	0.059	0.049	0.030
	(0.090)	(0.082)	(0.022)	(0.107)	(0.086)	(0.092)
K-P F	272	278	170	272	169	7.4
Hansen J					$p = 0.691$	

- $\hat{\beta}_3$ positive in 7 of 8 specifications (range: -0.008 to $+0.374$)
- **Bartik IV** produces similar estimates $\Rightarrow$ not an artifact of gravity exclusion restriction
- **Hansen** J: cannot reject instrument validity ($p = 0.691$)
- Ideal point distance: largest magnitude (0.045^{**})

Alternative Affinity: CEPII Structural Ties

CEPII composite $=$ (colony $+$ common language $+$ contiguity)$/3$ (time-invariant)

	Baseline (s3un)	CEPII (Gravity)	CEPII (Bartik)	CEPII Hi-$\lvert\varepsilon\rvert$	CEPII Lo-$\lvert\varepsilon\rvert$
$\hat{\beta}_3$	0.029	-1.532^{***}	0.109	-0.990	-1.699^{***}
	(0.090)	(0.529)	(0.297)	(0.871)	(0.554)

- CEPII captures **structural integration** (deep historical ties)
- Negative sign $\Rightarrow$ building block for structurally integrated partners
- Same elasticity-dependent pattern: concentrated in low-$\lvert\varepsilon\rvert$ subsample
- Two fundamentally different affinity measures, **same qualitative pattern**

Alternative Clustering (Moulton Robustness)

Regressors vary at (H, i, t) but outcome at (H, f, i, t) $\Rightarrow$ Moulton (1990) concern

	Baseline (H, f, i)	Cluster (H, i)	Cluster (i, t)	Two-way (Hfi, yr)
SE($\hat{\beta}_3$)	0.090	0.127	0.093	0.094
K-P F	272	45	134	118

- Point estimates identical (0.0286) across all clustering schemes
- (H, i) clustering most directly addresses Moulton: SE increases from 0.090 to 0.127
- K-P $F = 45$ under (H, i): still well above Stock–Yogo thresholds
- Qualitative inference unchanged

Diagnostic Tests

Diagnostic	**Statistic**	**Interpretation**
K-P F (baseline)	272	$\gg$ Stock–Yogo 10% threshold
K-P F (interaction)	139	Strong
Anderson–Rubin test	$p = 0.018$ (baseline) $p < 0.001$ (interaction)	Weak-IV robust
Hansen J (both IVs)	$p = 0.691$	Cannot reject validity
SW partial F	598, 442, 792	Each endogenous var well-identified
Lee–McCrary–Moreira–Porter	CIs numerically identical	No weak-IV distortion

- Instruments are strong across all specifications
- AR test is significant even when Wald test is marginal $\Rightarrow$ weak-IV robust inference supports the findings

FE Sensitivity

	Baseline	Less FE	No $e \times y$	No ISIC2$\times y$	Decomp $i \times y$	ISIC3$\times y$
$\hat{\beta}_3$	0.029	-0.008	0.029	-0.030	-0.004	0.065
	(0.090)	(0.091)	(0.088)	(0.083)	(0.091)	(0.097)
K-P F	272	276	273	302	276	287

- $\hat{\beta}_3$ ranges from -0.030 to $+0.065$ across FE configurations
- **Consistently small and imprecise** — consistent with Prop. 3 (ambiguous average)
- Instrument strength stable ($F > 272$) across all FE specs
- Removing exporter$\times$year has minimal impact; ISIC2$\times$year matters more

Empirical Summary

Finding	**Estimate**	**Significance**
Domestic market share (β_1)	0.027	Positive, robust
Political affinity, average (β_3)	0.029	Insignificant (as Prop. 3 predicts)
Interaction: $\beta_3 \times \mathbf{1}[\lvert\varepsilon\rvert > \text{med}]$	**0.505**	$p < 0.01$
β_3 in high-$\lvert\varepsilon\rvert$	$+0.370$	Stumbling block
β_3 in low-$\lvert\varepsilon\rvert$	-0.135	Building block ($p < 0.10$)
Wald test	$p = 0.053$	Marginal evidence

Consistent with theory: the average is ambiguous, the heterogeneity is where the action is.

Welfare: Over-Protection Under Political Affinity

At the optimum, the government's FOC is satisfied, but national welfare is not maximized:

$$\underbrace{\frac{\partial W_H}{\partial \tau^{anti}}}_{\text{national welfare}} = \underbrace{\frac{\partial G}{\partial \tau^{anti}}}_{=0 \text{ at optimum}} - \sum_r \varphi_r \frac{\partial \pi_{ir}}{\partial \tau^{anti}} = -\sum_r \varphi_r \frac{\partial \pi_{ir}}{\partial \tau^{anti}} < 0$$

- At the government's optimum, $\partial W_H / \partial \tau^{anti} < 0$
- Government **over-protects** relative to national welfare
- The **welfare wedge** is proportional to φ_r and s_{ir}

$\frac{\partial W_H}{\partial \varphi_r} < 0$ Increasing political affinity **unambiguously reduces** national welfare

Why Stumbling Blocks Are Costliest

Harberger triangle (deadweight loss of AD):

$$\text{DWL}_i \approx \frac{1}{2} \cdot |\varepsilon_i| \cdot (\tau_i^{anti})^2 \cdot M_{if}$$

Our finding:

- Stumbling blocks arise in **high-**$|\varepsilon|$ industries
- DWL per unit of protection is **largest** there

✓ Protection is costliest where it increases

Conversely:

- Building blocks arise in **low-**$|\varepsilon|$ industries
- DWL per unit of protection is **smallest** there

✓ Protection falls where it matters least

Aggregate deadweight loss is **amplified** by the industry composition: stumbling blocks where it's costly, building blocks where it's cheap.

Why Does Elasticity Matter? The Competing Forces

Apparent puzzle: structural equation says $\partial\tau/\partial\varphi_r \propto 1/|\varepsilon|$
$\Rightarrow$ Shouldn't the effect be larger when $|\varepsilon|$ is *low*?

Resolution under CES:

$$\varepsilon_{if} = \sigma_i - (\sigma_i - 1) \cdot s_{if} \qquad \Longleftrightarrow \qquad s_{if} = \frac{\sigma_i - \varepsilon_{if}}{\sigma_i - 1}$$

- Low $|\varepsilon| \Rightarrow$ high s_{if} (non-member import penetration)
- High $s_{if} \Rightarrow$ **strong tariff complementarity** $\Rightarrow$ building block dominates
- High $|\varepsilon| \Rightarrow$ low $s_{if} \Rightarrow$ **weak complementarity** $\Rightarrow$ coordination dominates

Sorting by $|\varepsilon|$ is equivalent to sorting by the **strength of the competing channel**.

Policy Synchronization: The Canada–US–China EV Case

Motivating example (2024):

- US imposes 100% tariff on Chinese EVs
- Canada matches $\Rightarrow$ informal tariff synchronization
- Why? 75% of Canadian exports go to the US (USMCA)

Model extension: small country S's modified objective:

$$G_S = CS_S + TR_S + \Pi_S - \lambda\big(|\tau_S - \tau_L|\big) \cdot V_S^{\text{FTA}}$$

- V_S^{FTA}: value of market access to large partner L
- $\lambda'(\cdot) > 0$: dissolution risk increases with tariff gap
- Pulls τ_S toward τ_L, even when $\tau_S^* \neq \tau_L$

φ_r in the data captures both altruistic internalization and strategic compliance.

Calibration: Canada EV — CAD $1.06 Billion/Year

Parameter	**Value**
Canadian imports of Chinese EVs	CAD $2.2 billion
Import demand elasticity (ISIC 34)	$\lvert\varepsilon\rvert = 1.5$
US-aligned tariff	$\tau_L = 100\%$
Canada's optimal tariff (Ossa 2014)	$\tau_S^* = 20\%$

$$\text{DWL}^{\text{sync}} = \frac{1}{2} \cdot 1.5 \cdot (1.00 - 0.20)^2 \cdot 2.2 = \textbf{CAD \$1.06 billion/year}$$

$$\approx 0.04\% \text{ of Canadian GDP}$$

- **Convexity**: most cost comes from the extreme tariff gap (80pp)
- Moderate case (gap = 15pp): only $10M/billion imports — 50× smaller

Counterfactual 1: Eliminating Political Affinity ($\varphi_r \to 0$)

Setting $\varphi_r = 0$ removes the tariff coordination channel:

	At mean $X^3 = 0.003$	At +1 SD ($X^3 = 0.023$)
Δ AD (high-$\lvert\varepsilon\rvert$)	-0.11 pp (-5%)	-0.85 pp (-39%)
Δ AD (low-$\lvert\varepsilon\rvert$)	$+0.04$ pp	$+0.31$ pp
Net effect (full sample)	$\sim$110 fewer AD cases	

- Removing φ_r reduces stumbling blocks *but also removes building blocks*
- Net effect is positive because stumbling block industries have higher AD rates
- Effects are economically meaningful at high-affinity pairs

Counterfactual 2–3: Composition & Synchronization Costs

Exercise 2: Industry composition shift

- The composition gap = interaction coefficient = 0.505 pp per unit of X^3
- Shifting trade toward low-$|\varepsilon|$ sectors reduces aggregate DWL

Exercise 3: Generalizing synchronization costs

Scenario	Tariff gap	$\lvert\varepsilon\rvert$	DWL per \$1B imports
EV case (extreme)	80 pp	1.5	\$480M
Steel (moderate)	15 pp	0.9	\$10M
Textiles (small)	5 pp	1.2	\$1.5M

- DWL is **quadratic** in the tariff gap $\Rightarrow$ overwhelmingly concentrated in episodes of extreme protection

Counterfactual 4–5: Fragmentation & Full Coordination

Exercise 4: Geopolitical fragmentation

- 1 SD increase in φ_r for high-exposure pair:
  - High-$|\varepsilon|$: $+0.04$ pp ($+1.7\%$)
  - Low-$|\varepsilon|$: -0.01 pp (building block partially offsets)
- Welfare cost depends on **industry composition** of fragmented trade

Exercise 5: Full coordination ($\varphi_r = 1$, customs union limit)

- At sample means: $\sum_r s_{ir}/s_{iH} = 0.002/0.993 < 0.2\%$
  $\Rightarrow$ Stumbling block channel quantitatively small at the average
- **But**: for specific high-φ, high-s_{ir} pairs (Canada in USMCA, EU periphery), the ratio can be orders of magnitude larger

Welfare Summary

1. $\partial W_H/\partial \varphi_r < 0$:
   Political affinity **unambiguously reduces** national welfare through over-protection
2. Stumbling blocks concentrate in high-$|\varepsilon|$ industries where DWL is **largest**
   $\Rightarrow$ Aggregate cost is **amplified** by industry composition
3. For asymmetric FTA partners, compliance costs can be substantial:
   Canada–US–China EV: **CAD $1.06 billion/year**
4. DWL is quadratic in tariff gap $\Rightarrow$ driven by **extreme episodes**

Summary of Contributions

1. **Theory**: φ_r determines whether FTAs are stumbling blocks or building blocks
   - Proposition 3 reconciles Limão (2006) vs. EFO (2008)
   - Firm heterogeneity amplifies but does not alter predictions (Melitz extension)
2. **Empirics**: heterogeneity modulated by $|\varepsilon|$
   - Interaction: 0.505^{***} ($p < 0.01$); strong instruments (K-P $F = 139$)
   - High-$|\varepsilon|$: stumbling block ($+0.370$)
   - Low-$|\varepsilon|$: building block (-0.135^{*})
   - Two alternative affinity measures yield consistent patterns
3. **Welfare**: stumbling blocks where protection is costliest
   - Canada–US–China EV calibration: CAD \$1.06B/year
   - Synchronization costs quadratic in tariff gap

Limitations

- **Statistical precision**: Wald test $p = 0.053$ (marginal; not below 5%)
  - But: AR test $p < 0.001$; interaction $p < 0.01$
- **LPM**: approximately 40% of fitted values below zero (binary outcome)
  - Standard for high-dimensional FE + IV settings
- **Partial equilibrium**: no retaliation, GE feedback, or terms-of-trade effects
- φ_r **exogenous**: treated as a parameter, not endogenized
- **Dynamic specifications**: instruments lose power beyond 1–2 lags

Future Directions

- **Structural estimation of φ_r**
  Invert the model's FOCs (following Goldberg–Maggi 1999)
  $\Rightarrow$ Recover φ_r by country pair and time period
- **General equilibrium counterfactuals**
  Embed in Caliendo–Parro (2015) or Ossa (2014) framework
- **Episode studies**: USMCA, EU enlargement, RCEP
  $\Rightarrow$ Sharper identification from specific policy changes
- **Geoeconomic fragmentation**
  How does bloc formation (BGH 2025, Bonadio et al. 2025) interact with AD diversion?

The Bottom Line

FTAs are neither stumbling blocks nor building blocks.

They are **both**—depending on political affinity
and the elasticity environment.

The welfare cost of the stumbling block channel is **amplified**
by its concentration in high-elasticity industries
where protection is costliest.

Thank you

Comments welcome.

Backup Slides

First-Stage Regressions

	s_{iH}	$\sum \varphi_r s_{ir}$
Gravity-predicted	0.9949***	0.3755***
	(0.001)	(0.025)
F-stat	1,250,000	222
R^2	0.830	0.336
N	311,896	311,896

- s_{iH}: near-perfect prediction ($R^2 = 0.83$)
- $\sum \varphi_r s_{ir}$: moderate but highly significant ($F = 222$)
- Both well above Stock–Yogo critical values

Heterogeneity by Substitution Elasticity σ (Proposition 7)

	High σ	Low σ	Interaction
$\hat{\beta}_3$	0.080	0.188	0.082
	(0.169)	(0.189)	(0.172)
σ interaction			0.047
			(0.186)
K-P F	203	44	35
N	123,658	122,350	246,098

- Directionally consistent with Prop. 7 (higher $\hat{\beta}_3$ in low-σ)
- **Not statistically significant**
- σ and ε overlap conceptually under CES

Dynamic Lag Structure (Table 3)

	$L = 1$	$L = 1$–2	$L = 1$–3	$L = 1$–6
$L1\_X^3$	-0.045	-0.006	0.023	-1.012
	(0.078)	(0.083)	(0.090)	(1.424)
K-P F	97.6	10.8	6.3	0.32
N	136,516	95,652	67,041	21,652

- Instruments lose power rapidly with additional lags
- Contemporaneous / 1-lag specification is the well-identified spec
- Point estimates noisy but generally small

Full Structural Equation (Eq. 15, with $\tau_{ir} \neq 0$)

$$\varepsilon_{if} \cdot \tau_i^{anti*} = \frac{\sigma_i - 1}{\sigma_i} \cdot s_{iH} \qquad \text{(Term 1: domestic share)}$$

$$+ (\sigma_i - 1) \sum_r \tau_{ir}\, s_{ir} \qquad \text{(Term 2: tariff complementarity)}$$

$$+ \frac{\sigma_i - 1}{\sigma_i} \sum_r \varphi_r (1 - \tau_{ir})\, s_{ir} \qquad \text{(Term 3: tariff coordination)}$$

Comparative statics:

- $\partial \tau^{anti*} / \partial s_{iH} > 0$ (Prop. 1: profit-shifting)
- $\partial \tau^{anti*} / \partial \tau_{ir} > 0$ (Prop. 1: complementarity)
- $\partial \tau^{anti*} / \partial \varphi_r > 0$ (Prop. 2: coordination)
- Net $\partial \tau^{anti*} / \partial$FTA: ambiguous (Prop. 3)

Full Estimating Equation (with Term 2)

$$\mathrm{AD}_{if,t} = \beta_0 + \beta_1\, s_{iH,t} + \beta_2 \sum_r \tau_{ir,t}\, s_{ir,t} + \beta_3 \sum_r \varphi_{r,t}(1-\tau_{ir,t})\, s_{ir,t} + \mathrm{FE} + \epsilon$$

Variable	**Estimate (Table 4, col 6)**
β_1 (domestic share)	0.025
β_2 (tariff complementarity)	0.000
β_3 (tariff coordination)	0.030
K-P F	7.4

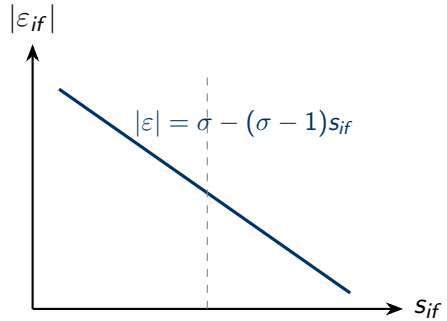
- 3-term specification is weakly identified (K-P $F = 7.4$)
- Under $\tau_{ir} = 0$ (baseline), Term 2 drops out
- This justifies focusing on the $\tau_{ir} = 0$ specification

CES Mechanism: $|\varepsilon|$ vs. s_{if}

Under CES preferences with N varieties:

$$\varepsilon_{if} = \sigma_i - (\sigma_i - 1) \cdot s_{if}$$

- This is a **one-to-one, monotonically decreasing** relationship
- $|\varepsilon| \downarrow \Leftrightarrow s_{if} \uparrow$ (non-member import penetration)
- Sorting by $|\varepsilon|$ is *equivalent* to sorting by s_{if} in opposite direction



Welfare Derivation: Key Equations

Consumer surplus change:

$$\frac{\partial CS_i}{\partial \tau^{anti}} < 0 \quad \text{(higher prices hurt consumers)}$$

Tariff revenue change:

$$\frac{\partial TR_i}{\partial \tau^{anti}} > 0 \quad \text{for } \tau < \frac{1}{\sigma - 1} \quad \text{(Laffer curve, below peak)}$$

National welfare wedge:

$$\left.\frac{\partial W_H}{\partial \tau^{anti}}\right|_{\tau=\tau^{anti*}} = -\sum_r \varphi_r \cdot \frac{\partial \pi_{ir}}{\partial \tau^{anti}} < 0$$

Effect of φ_r on welfare:

$$\frac{\partial W_H}{\partial \varphi_r} = -\frac{(\sigma - 1)^2}{\sigma} \cdot \frac{s_{ir} \cdot s_{iH}}{\varepsilon_{if}} < 0$$