

Recovering Credible Trade Elasticities From Incredible Trade Reforms

Alessandria, Khan, Khederlarian, Ruhl, and Steinberg

April 2025

Intro

- ▶ Trade elasticity: most important concept in international economics?
- ▶ Structural interpretation: response to **canonical reform**: unanticipated & once-and-for-all
- ▶ Reduced form estimates: vary widely, both across time horizons but also across contexts
- ▶ This paper: canonical reforms don't exist in the data!
 - ▶ Empirical: compare “more-canonical” vs. “less-canonical” reforms
 - ▶ Quantitative: recover canonical elasticity by feeding data through structural model

Big idea: $\Delta\text{trade} = f(\Delta\text{observed policy, expectations})$

Non-canonical reforms

Anticipation (e.g. phased-in PTAs)

Uncertainty (e.g. Brexit, Trump tariffs)

+

Dynamic trade theory

Forward-looking export participation decisions due to front-loaded costs, back-loaded returns

- Trade depends on stochastic policy process, not just observed realizations
- Changes in expectations cause trade growth, even when policy doesn't change
- **Same policy change causes different trade responses under different expectations**

Big question: empirical estimates vs. canonical elasticities

- ▶ How canonical is the typical trade reform? Which reforms are most/least canonical?
- ▶ How and why do trade elasticity estimates from non-canonical reforms differ from canonical elasticities? How big are the differences?
- ▶ **Can data from non-canonical reforms tell us about canonical elasticities?**

Preview: empirics

- ▶ U.S. import data from 1974–2017
- ▶ Assign country-product-year observations into regimes: NNTR, MFN, PTA, UTPP
- ▶ Compare tariff & trade dynamics within regimes vs. across regimes
 - ▶ Within: Common & transitory, low trade elasticities (~ 3 in LR)
 - ▶ Across: Rare, large, & persistent, high trade elasticities (~ 6 in LR)
 - ▶ $N_{\text{Within}} \gg N_{\text{Across}} \Rightarrow$ full-sample estimates get responses to major reforms wrong
- ▶ Case studies: China & Vietnam
 - ▶ Same policy path: Embargo \rightarrow NNTR \rightarrow conditional MFN \rightarrow “permanent” MFN
 - ▶ More persistent tariffs, higher trade elasticities than typical regime switch (~ 11 in LR)
 - ▶ Different trade dynamics in SR \Rightarrow different expectations

Preview: model

- ▶ Heterogeneous firms, sunk entry costs, fixed costs probabilistically improve market access
 - ▶ Alessandria, Choi, and Ruhl (2021) with many goods in partial equilibrium
- ▶ Illustrate measurement biases from non-canonical policy dynamics
 - ▶ Expected future tariffs change less than observed tariffs $\Rightarrow \downarrow$ LR elasticity
 - ▶ Expectations change before policy $\Rightarrow \uparrow$ SR elasticity
- ▶ Recover canonical trade elasticity using China & Vietnam case studies
 - ▶ Estimate regime-switching probability to match reduced-form elasticity path as in Alessandria et al. (2025a)
 - ▶ Conduct counterfactual canonical reform. LR elasticity ≈ 14 .

Related Literature

► Strands:

- Trade dynamics (data): Orcutt (1950), Houthakker-Magee (1969), Gallaway et al. (2003), Baier-Bergstrand (2007), Yilmazkuday (2019), Khan-Khederlarian (2021), Boehm et al. (2023)
- Trade dynamics (models): Baldwin-Krugman (1989), Das et al. (2007), Alessandria-Choi (2007), Ruhl-Willis (2017), Alessandria et al. (2021), Steinberg (2023), Fitzgerald et al., (2024)
- Trade-policy uncertainty: Ruhl (2011), Pierce-Schott (2016), Handley-Limão (2015 & 2017), Steinberg (2019), Caldara et al. (2020), Bianconi et al. (2021), Alessandria et al. (2025ab)

► Lessons:

- Reduced-form estimates biased by interaction between forward-looking decisions and policy dynamics
- Some reforms “more canonical” than others. Estimates from “less canonical” reforms lack external validity.
- Disentangling effects of past reforms vs. policy dynamics requires model
- Ideal setting: well-specified policy process and few realized policy changes

Roadmap

1. Empirical evidence
2. Model + numerical experiments
3. Calibration + recover structural elasticity

Data

- ▶ Sample: U.S. imports from 1974–2017
 - ▶ Captures transition from high tariffs in 70s & 80s to low tariffs (until liberation day)
 - ▶ Covers major reforms: China's NTR grant, NAFTA, GATT rounds, GSP, etc.
- ▶ Aggregation: 5-digit SITC rev. 2
 - ▶ 1974–1988 U.S. imports at 8-digit TS-USA level: Concordance by Feenstra (1996)
 - ▶ 1989–2017 U.S. imports at 8-digit HTS level: Concordance using UNCTAD
- ▶ 44 years (t), 163 countries (j), 2,032 goods (g), 2,279,579 observations (jgt)
 - ▶ Drop jg affected by TTBs at any point in observation period
- ▶ Policy at jgt level: applied tariff (=duties/FOB imports)

Approach #1: Within vs. across tariff regimes

- ▶ Four statutory policy regimes: **MFN**, Non-Normal Trade Relations (**NNTR**), Preferential Trade Agreement (**PTA**), Unilateral Trade Preference Program (**UTPP**)
- ▶ Compare policy and trade dynamics within vs. across regimes

From	To	N # <i>jgt</i>	Mean (p.p.)	Median (p.p.)	Std. dev. (p.p.)
<i>(a) Within</i>					
NTR	NTR	1,352,360	-0.15	0.00	9.47
NNTR	NNTR	10,542	-0.25	0.00	9.25
PTA	PTA	75,910	-0.12	0.00	1.34
UTPP	UTPP	149,526	-0.03	0.00	1.04
<i>(b) Across</i>					
NNTR	NTR	1,523	-27.63	-26.17	24.04
NTR	PTA	10,291	-3.01	-1.80	4.57
NTR	UTPP	29,860	-4.02	-2.90	14.53
Total		1,671,098	-0.17	0.00	8.92

Approach #1: Within vs. across tariff regimes

- ▶ Four statutory policy regimes: **MFN**, Non-Normal Trade Relations (**NNTR**), Preferential Trade Agreement (**PTA**), Unilateral Trade Preference Program (**UTPP**)
- ▶ Compare policy and trade dynamics within vs. across regimes

From	To	N # <i>jgt</i>	Mean (p.p.)	Median (p.p.)	Std. dev. (p.p.)
<i>(a) Within</i>					
NTR	NTR	1,352,360	-0.15	0.00	9.47
NNTR	NNTR	10,542	-0.25	0.00	9.25
PTA	PTA	75,910	-0.12	0.00	1.34
UTPP	UTPP	149,526	-0.03	0.00	1.04
<i>(b) Across</i>					
NNTR	NTR	1,523	-27.63	-26.17	24.04
NTR	PTA	10,291	-3.01	-1.80	4.57
NTR	UTPP	29,860	-4.02	-2.90	14.53
Total		1,671,098	-0.17	0.00	8.92

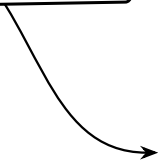
Vast majority of sample. Small mean-zero tariff changes.

Approach #1: Within vs. across tariff regimes

- ▶ Four statutory policy regimes: **MFN**, Non-Normal Trade Relations (**NNTR**), Preferential Trade Agreement (**PTA**), Unilateral Trade Preference Program (**UTPP**)
- ▶ Compare policy and trade dynamics within vs. across regimes

From	To	N # <i>jgt</i>	Mean (p.p.)	Median (p.p.)	Std. dev. (p.p.)
<i>(a) Within</i>					
NTR	NTR	1,352,360	-0.15	0.00	9.47
NNTR	NNTR	10,542	-0.25	0.00	9.25
PTA	PTA	75,910	-0.12	0.00	1.34
UTPP	UTPP	149,526	-0.03	0.00	1.04
<i>(b) Across</i>					
NNTR	NTR	1,523	-27.63	-26.17	24.04
NTR	PTA	10,291	-3.01	-1.80	4.57
NTR	UTPP	29,860	-4.02	-2.90	14.53
Total		1,671,098	-0.17	0.00	8.92

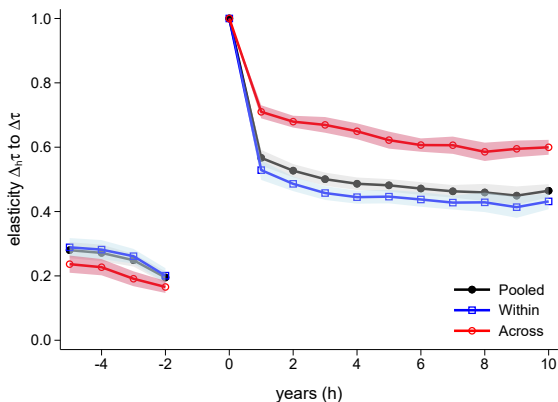
Small fraction of sample. Large tariff cuts/hikes.



Across-regime tariff changes are more persistent

$$\Delta_h \tau_{jgt} = \beta_h^W \Delta_0 \tau_{jgt} \text{Within}_{jgt} + \beta_h^A \Delta_0 \tau_{jgt} \text{Across}_{jgt} + \delta_{jt} + \delta_{gt} + u_{jgt}$$

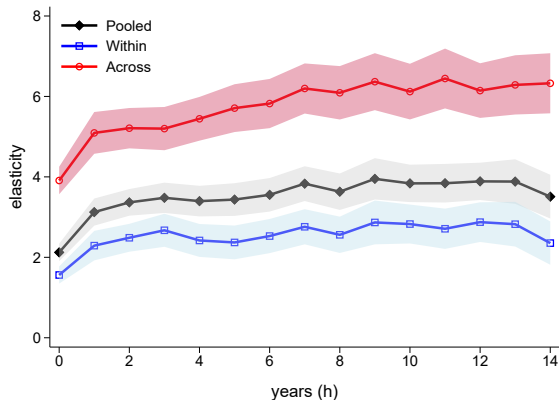
- ▶ Tariff-change autocorrelation, conditioning on regime switches
 - ▶ $\text{Within}_{jgt} = \mathbb{1}_{\{\text{regime}_{jgt} \neq \text{regime}_{jgt-1}\}}$
 - ▶ $\text{Across}_{jgt} = \mathbb{1}_{\{\text{regime}_{jgt} = \text{regime}_{jgt-1}\}}$
- ▶ δ_{gt} : common variation across countries, e.g. GATT rounds. Bigger differences when excluded.
- ▶ $\beta_h^W \approx$ pooled β_h because sample mostly comprised of within-regime obs



Across-regime tariff changes have higher trade elasticities

$$\Delta_h x_{jgt} = -\beta_h^W \Delta_h \tau_{jgt} \text{Within}_{jgt} - \beta_h^A \Delta_h \tau_{jgt} \text{Across}_{jgt} + \delta_{jt} + \delta_{gt} + u_{jgt}.$$

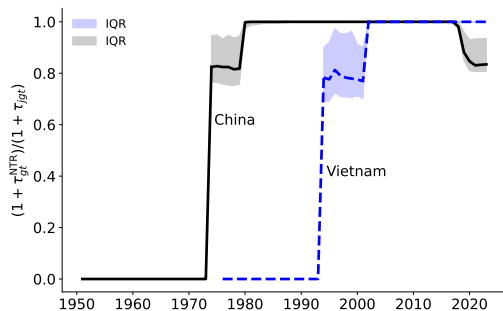
- ▶ Use $\Delta_0 \tau$ as IV for $\Delta_h \tau$ (BLPN 2023)
 - ▶ IRF to tariff shock at $h = 0$
 - ▶ Incorporate across vs. within differences in tariff autocorrelation
- ▶ δ_{jt} : bilateral exchange-rate movements, exporter business cycles
- ▶ δ_{gt} : good-specific demand shocks, multilateral policy changes
- ▶ Again, $\beta_h^W \approx$ pooled β_h
- ▶ Robust to other specifications (e.g. ECM), industry- j - t effects



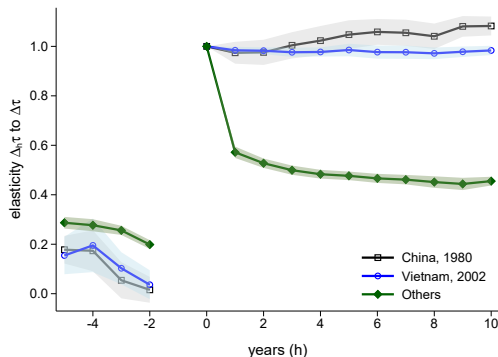
Approach #2: Case studies of China & Vietnam

- ▶ Same observed policy trajectory: embargo → NNTR → MFN
- ▶ Ex post, “most canonical” reforms in US trade history. Ex ante, lots of uncertainty.
- ▶ Clearly-defined policy risk, no phase-in, embargo start allow for clean quantitative analysis

Inverse tariffs (rel. MFN countries)



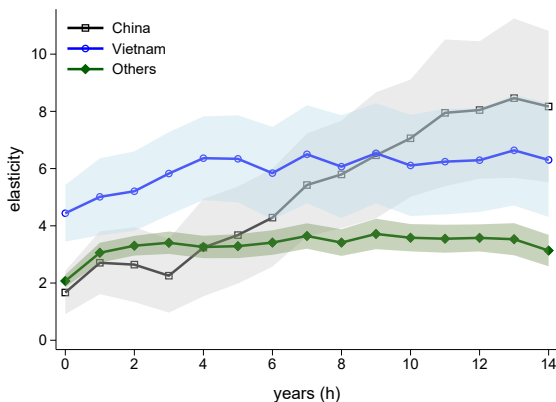
Tariff-change autocorrelation



CHN & VNM have higher trade elasticities than other countries

$$\Delta_h x_{jgt} = -\beta_h^{\text{CHN}} \Delta_h \tau_{jgt} \mathbb{1}_{\{j=\text{CHN}\}} - \beta_h^{\text{VNM}} \Delta_h \tau_{jgt} \mathbb{1}_{\{j=\text{VNM}\}} - \beta_h^{\text{OTH}} \Delta_h \tau_{jgt} \mathbb{1}_{\{j=\text{Other}\}} + \delta_{jt} + \delta_{gt} + u_{jgt}$$

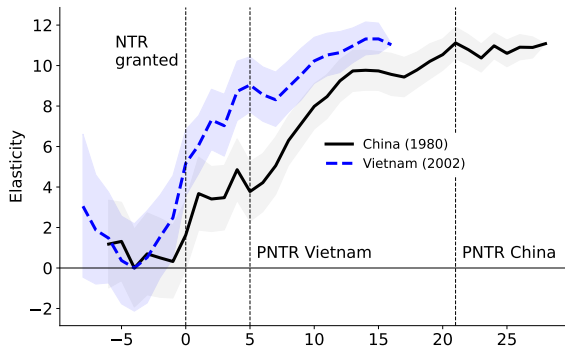
- ▶ Condition on countries instead of regime changes
- ▶ Includes all tariff changes for China and Vietnam, not just MFN grant
- ▶ Long run: CHN and VNM similar, larger than other countries (and also typical regime change)
- ▶ Short run: CHN similar to other countries but VNM higher (and similar to typical regime change)



Event-study to MFN access shows even higher elasticities

$$v_{jgt} = \sum_{t'=1974}^{2008} \beta_t^{\text{CHN}} \mathbb{1}_{\{t=t' \wedge j=\text{CHN}\}} X_g + \sum_{t'=1994}^{2017} \beta_t^{\text{VNM}} \mathbb{1}_{\{t=t' \wedge j=\text{VNM}\}} X_g + \delta_{jt} + \delta_{jg} + \delta_{gt} + u_{jgt}.$$

- ▶ Elasticity of trade to gap between NNTR and MFN tariffs (“NNTR gap”):
 - ▶ $X_g = \log(1 + \tau_{g,1999}^{\text{NNTR}} - \tau_{g,1999}^{\text{MFN}})$
- ▶ Dual meaning: tariff reduction upon MFN access, but also exposure to risk of losing that access
- ▶ Similar LR elasticities, substantially larger than country averages and for average regime change
- ▶ Similar pre-MFN elasticities, but VNM's starts rising several years before MFN access



Roadmap

1. Empirical evidence
- 2. Model + numerical experiments**
3. Calibration + recover structural elasticity

Overview of the model

- ▶ Partial equilibrium version of Alessandria, Choi and Ruhl 2021 (ACR 2021)
 - ▶ Slow adjustment due to exporter life-cycle, large gap between SR and LR response
 - ▶ Expectations about future trade policy, not current policy, drive export participation
- ▶ Firms
 - ▶ Heterogeneous in productivity (z), variable trade cost (ξ)
 - ▶ Die with probability $1 - \delta$, replaced by new firm (fixed mass)
 - ▶ Pay sunk cost to export next period, smaller fixed cost to continue
 - ▶ New exporters start with low export capacity (ξ_H)
 - ▶ Longer tenure as exporter \Rightarrow greater chance of low iceberg cost (ξ_L w.p. $1 - \rho_\xi$)
- ▶ Trade policy
 - ▶ Allow for innovations to current tariffs (τ) and expectations about future tariffs ($\mathbb{E}\tau'$)
 - ▶ Exporting threshold depends on expected z , ξ and $\mathbb{E}\tau'$

Production, demand, static optimization

- ▶ Production technology (z = productivity; ℓ = labor):

$$y = z\ell$$

- ▶ Export demand curve (p = price; τ = tariff):

$$d(p, \tau) = (p\tau)^{-\theta}$$

- ▶ Resource constraint (ξ = variable trade cost):

$$y \geq \xi d(p, \tau)$$

- ▶ Given z, ξ, τ , choose p, ℓ to max flow profits

$$\pi(z, \xi, \tau) = \max_{p, \ell} p d(p, \tau) - w\ell \quad \text{s.t.} \quad z\ell \geq \xi d(p, \tau)$$

Exporter life cycle, dynamic optimization

- ▶ Variable trade cost (ξ) captures current export status
 - ▶ ∞ : non-exporter
 - ▶ ξ_H : High iceberg (low-capacity) exporter
 - ▶ ξ_L : low iceberg (high-capacity) exporter
- ▶ Costs of exporting in $t + 1$ depend on current export status in t
 - ▶ New exporters: pay f_0 , start with low export capacity (ξ_H)
 - ▶ Continuing exporters: pay f_1 , switch to higher/lower export capacity with prob. $1 - \rho_\xi$
- ▶ Given z, ξ, τ , choose whether to export at $t + 1$ to max PV of profits:

$$V(z, \xi, \tau) = \pi_{gt}(z, \xi, \tau) + \max \left\{ \underbrace{-f(\xi) + \frac{\delta(z)}{1+r} \mathbb{E} V(z', \xi', \tau')}_{\text{export}}, \underbrace{\frac{\delta(z)}{1+r} \mathbb{E} V(z', \infty, \tau')}_{\text{don't export}} \right\}$$

- ▶ Solution characterized by entry + exit thresholds that depend on z, ξ , and $\mathbb{E}\tau'$

Aggregation, trade elasticities

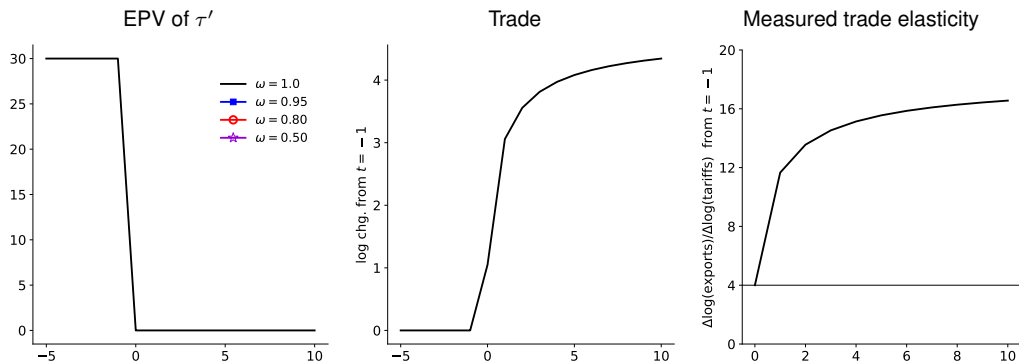
- ▶ Aggregate exports:

$$EX = \sum_{\xi \in \{\xi_L, \xi_H\}} \int_Z p(z, \xi, \tau) d(p(z, \xi, \tau), \tau) \varphi(z, \xi) dz.$$

- ▶ Per-firm sales (pd') depend on current tariffs
 - ▶ Distribution (φ) depends on τ process: past realizations + expectations about future
- ▶ Mapping to canonical trade elasticities:
 - ▶ SR response to *unanticipated* reform: demand elasticity = θ
 - ▶ LR response to *permanent* reform: $> \theta$, increasing in ξ_H/ξ_L and ρ_ξ

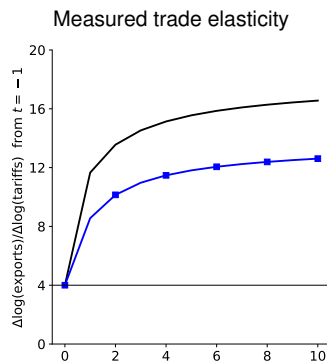
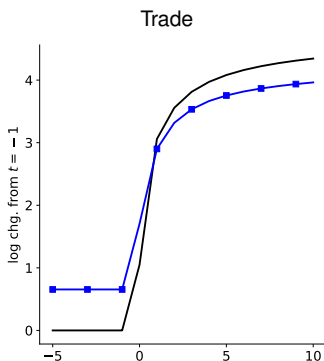
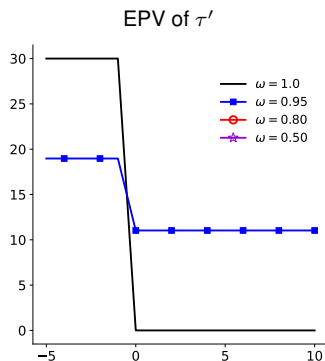
Experiment #1: persistent vs. transitory shocks

- ▶ Two-state Markov process: high vs. low tariffs, switching probability $1 - \omega$
- ▶ Start with τ_H for $t = -\infty, \dots, -1$, then switch to τ_L for $t = 0, \dots, \infty$
- ▶ Compare canonical reform ($\omega = 1.0$) to less persistent reforms ($\omega \in \{0.95, 0.80, 0.5\}$)



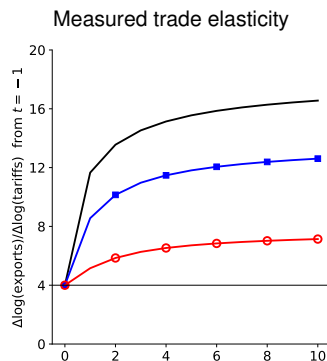
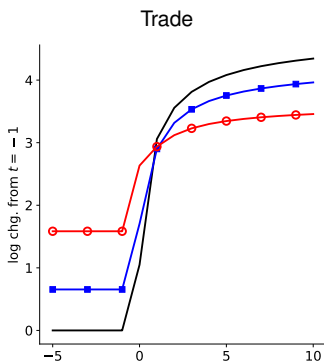
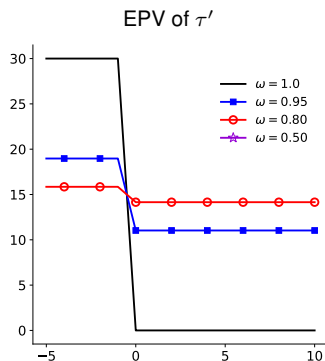
Experiment #1: persistent vs. transitory shocks

- ▶ Two-state Markov process: high vs. low tariffs, switching probability $1 - \omega$
- ▶ Start with τ_H for $= -\infty, \dots, -1$, then switch to τ_L for $t = 0, \dots, \infty$
- ▶ Compare canonical reform ($\omega = 1.0$) to less persistent reforms ($\omega \in \{0.95, 0.80, 0.5\}$)



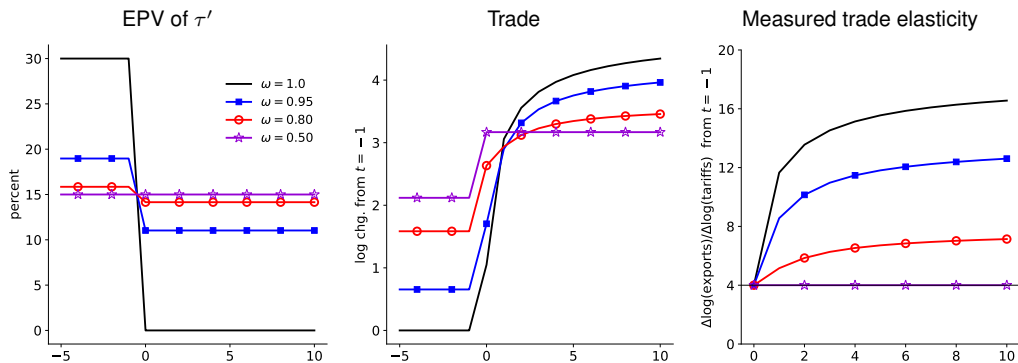
Experiment #1: persistent vs. transitory shocks

- ▶ Two-state Markov process: high vs. low tariffs, switching probability $1 - \omega$
- ▶ Start with τ_H for $t = -\infty, \dots, -1$, then switch to τ_L for $t = 0, \dots, \infty$
- ▶ Compare canonical reform ($\omega = 1.0$) to less persistent reforms ($\omega \in \{0.95, 0.80, 0.5\}$)



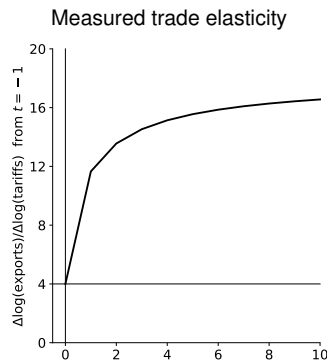
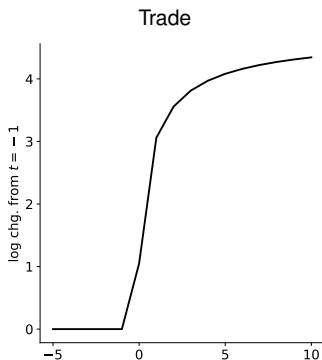
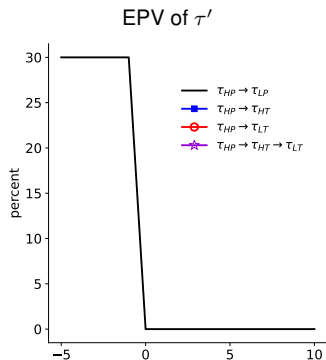
Experiment #1: persistent vs. transitory shocks

- ▶ Two-state Markov process: high vs. low tariffs, switching probability $1 - \omega$
- ▶ Start with τ_H for $= -\infty, \dots, -1$, then switch to τ_L for $t = 0, \dots, \infty$
- ▶ Compare canonical reform ($\omega = 1.0$) to less persistent reforms ($\omega \in \{0.95, 0.80, 0.5\}$)



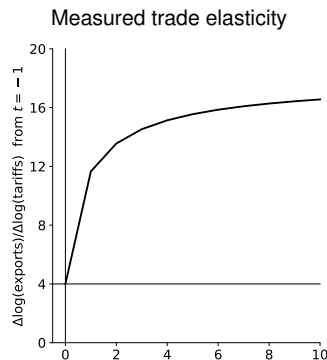
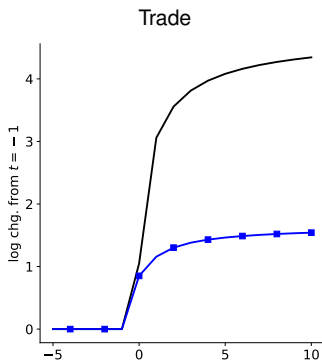
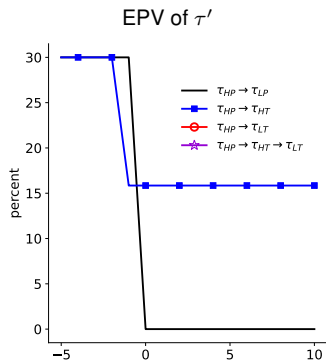
Experiment #2: shocks to expectations

- ▶ Four-state Markov process: $[\tau_H, \tau_L] \times [\omega_P, \omega_T]$
- ▶ Four experiment variations:
 - ▶ $\tau_{HP} \rightarrow \tau_{LP}$: \downarrow tariffs only
 - ▶ $\tau_{HP} \rightarrow \tau_{HT}$: \downarrow persistence only
 - ▶ $\tau_{HP} \rightarrow \tau_{LT}$: simultaneous \downarrow in tariffs and persistence in $t = 0$
 - ▶ $\tau_{HP} \rightarrow \tau_{HT} \rightarrow \tau_{LT}$: \downarrow persistence in $t = -1$, then \downarrow tariffs in $t = 0$



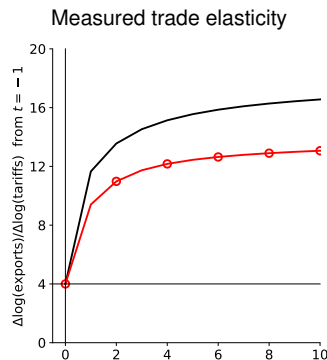
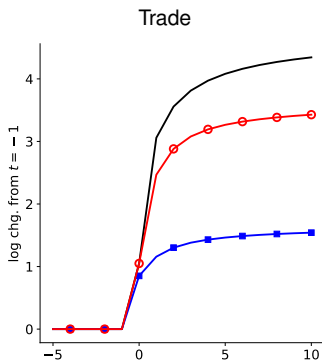
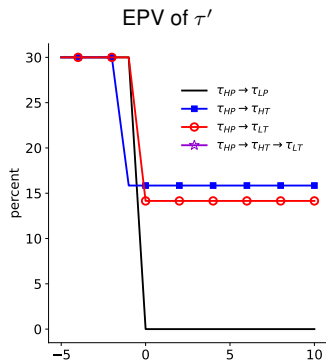
Experiment #2: shocks to expectations

- ▶ Four-state Markov process: $[\tau_H, \tau_L] \times [\omega_P, \omega_T]$
- ▶ Four experiment variations:
 - ▶ $\tau_{HP} \rightarrow \tau_{LP}$: \downarrow tariffs only
 - ▶ $\tau_{HP} \rightarrow \tau_{HT}$: \downarrow persistence only
 - ▶ $\tau_{HP} \rightarrow \tau_{LT}$: simultaneous \downarrow in tariffs and persistence in $t = 0$
 - ▶ $\tau_{HP} \rightarrow \tau_{HT} \rightarrow \tau_{LT}$: \downarrow persistence in $t = -1$, then \downarrow tariffs in $t = 0$



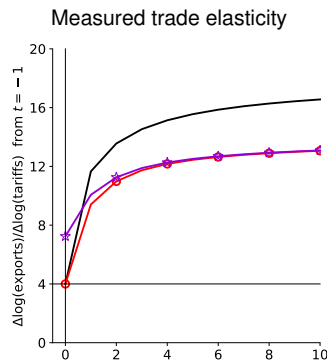
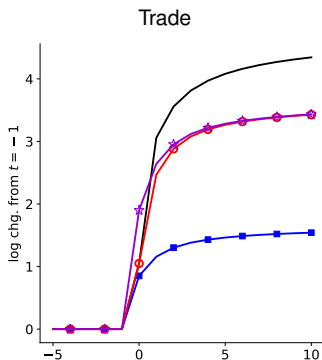
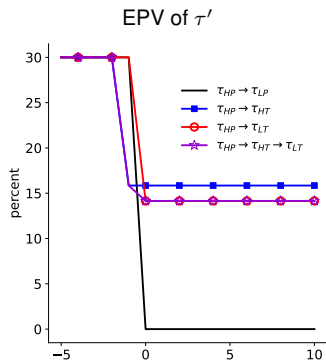
Experiment #2: shocks to expectations

- ▶ Four-state Markov process: $[\tau_H, \tau_L] \times [\omega_P, \omega_T]$
- ▶ Four experiment variations:
 - ▶ $\tau_{HP} \rightarrow \tau_{LP}$: \downarrow tariffs only
 - ▶ $\tau_{HP} \rightarrow \tau_{HT}$: \downarrow persistence only
 - ▶ $\tau_{HP} \rightarrow \tau_{LT}$: simultaneous \downarrow in tariffs and persistence in $t = 0$
 - ▶ $\tau_{HP} \rightarrow \tau_{HT} \rightarrow \tau_{LT}$: \downarrow persistence in $t = -1$, then \downarrow tariffs in $t = 0$



Experiment #2: shocks to expectations

- ▶ Four-state Markov process: $[\tau_H, \tau_L] \times [\omega_P, \omega_T]$
- ▶ Four experiment variations:
 - ▶ $\tau_{HP} \rightarrow \tau_{LP}$: \downarrow tariffs only
 - ▶ $\tau_{HP} \rightarrow \tau_{HT}$: \downarrow persistence only
 - ▶ $\tau_{HP} \rightarrow \tau_{LT}$: simultaneous \downarrow in tariffs and persistence in $t = 0$
 - ▶ $\tau_{HP} \rightarrow \tau_{HT} \rightarrow \tau_{LT}$: \downarrow persistence in $t = -1$, then \downarrow tariffs in $t = 0$



Experiment takeaways

- ▶ Transitory reforms have lower long-run trade elasticities
 - ▶ Post-reform trade suppressed by higher likelihood of reversal
 - ▶ Pre-reform trade boosted by expectation that reform more likely to happen
- ▶ Anticipated reforms have higher short-run trade elasticities
 - ▶ Trade begins to react when expectations change, not just when tariffs change
- ▶ Reforms can be non-canonical in different ways
 - ▶ Across-regime tariff changes more canonical in sense of experiment #1, but less canonical in sense of experiment #2
 - ▶ China & Vietnam similar in sense of experiment #1, but Vietnam less canonical in sense of experiment #2

Roadmap

1. Empirical evidence
2. Model + numerical experiments
- 3. Calibration + recover structural elasticity**

Overview of quantitative approach

- ▶ Leverage China & Vietnam case studies using Alessandria et al. (2025) methodology
- ▶ Model overview
 - ▶ Many goods $g = 1, \dots, G$ with tariffs $\tau_{gt}(s)$ that depend on trade-policy state s
 - ▶ Two states: NNTR ($s = 0$) and MFN ($s = 1$)
 - ▶ Time-varying stochastic process $\{\omega_t(s, s')\}_{t=0}^{\infty}$
- ▶ Estimate trade technology to match modern-day steady state
 - ▶ Key input: exporter-level panel data
- ▶ Estimate ω_t to match transition from embargo
 - ▶ Key input: NNTR-gap elasticity
- ▶ Use calibrated model to conduct canonical reform, measure long-run trade elasticity

Step #1: Calibrate steady state to firm-level trade dynamics

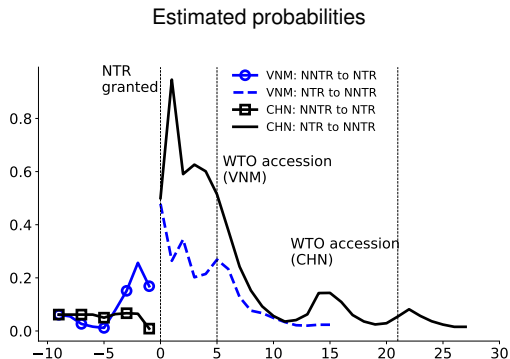
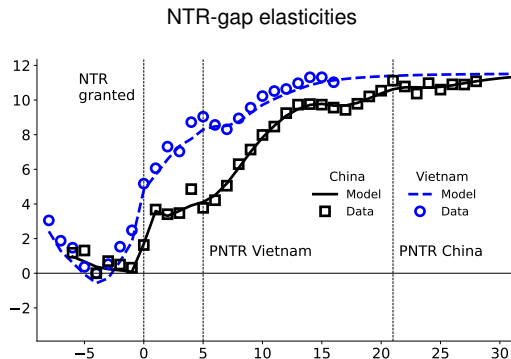
- ▶ For each country, use firm-level panel data to compute facts about cross-sectional distribution and life-cycle dynamics of export participation
- ▶ Calibrate production & trade technologies so that PNTR steady state matches these facts

Country	Targets				Parameters			
	Export part. (%)	Exit rate (%)	Incumbent prem.	Log CV exports	f_0	f_1	ξ_H	σ_z
China	28	11	2.9	2.27	0.73	0.342	3.92	1.50
Vietnam	11	15	4.41	2.91	1.57	0.657	5.89	1.69

- ▶ Note: Assign demand elasticity θ externally based on Soderberry (2018) estimates
 - ▶ Reminder: θ = canonical SR elasticity
 - ▶ Same as measured SR elasticity in experiments, except with anticipation shocks
 - ▶ Works for China & Vietnam, even though latter has higher measured SR elasticity

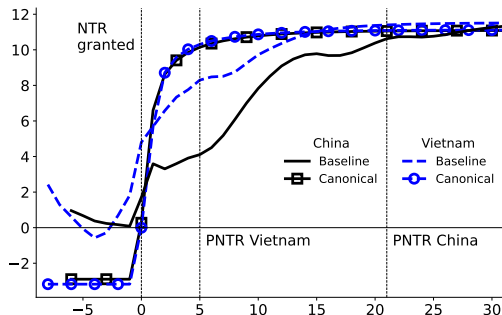
Step #2: Calibrate transition to aggregate trade dynamics

- Calibrate policy process to match elasticity of trade to NNTR gap
 - Pre-NTR dynamics identify $\omega_t(NNTR, MFN)$
 - Post-NTR dynamics identify $\omega_t(MFN, NNTR)$



Step #3: Measure canonical LR elasticities

- ▶ Start in NNTR steady state. Switch to NTR unanticipated + permanent.
- ▶ Measure canonical LR elasticity as SS-to-SS change in NNTR-gap elasticity
 - ▶ China: -14.0
 - ▶ Vietnam: -14.3
 - ▶ ~25% larger than observed change
- ▶ Observed LR elast biased ↓
 - ▶ $P(NTR) > 0$ before NTR grant
 - ▶ $P(NNTR) > 0$ after (even post-WTO)
- ▶ Observed SR elast biased ↑ for Vietnam due to $P(NTR) \uparrow$ during NNTR period



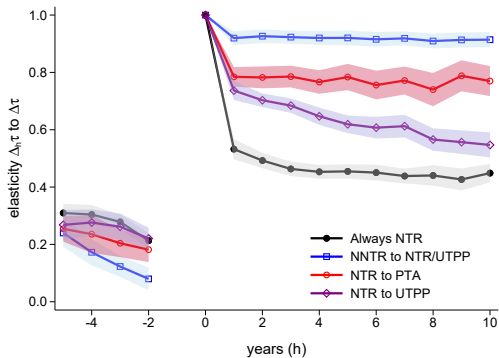
Summary & parting thoughts

- ▶ Empirical evidence on more-canonical vs. less-canonical reforms
 - ▶ Most reforms occur within tariff regimes. Transitory, with low LR trade elasticities.
 - ▶ Regime changes rare but persistent. Higher LR elasticities. Also higher SR elasticities, likely due to anticipation.
 - ▶ Most canonical: China & Vietnam MFN access. Very high LR elasticities. Differences in SR due to differences in anticipation.
- ▶ Recover canonical elasticity path using quantitative model
 - ▶ Estimate expectations for China & Vietnam by matching reduced-form evidence
 - ▶ Use calibrated model to conduct canonical reform. LR trade elasticity ≈ 14 .
- ▶ Recent events = bittersweet vindication of our perspective
 - ▶ Now clear that trade policy (even PTAs) less credible than people realized
 - ▶ Need to go beyond within-*g* variation and well-defined risks
 - ▶ Aggregate policy risk, ambiguity about distribution of potential tariff changes, etc.

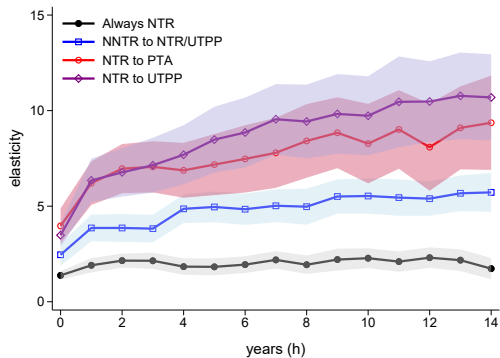
Appendix

Across vs. within regimes: detailed breakdown

Tariff autocorrelations

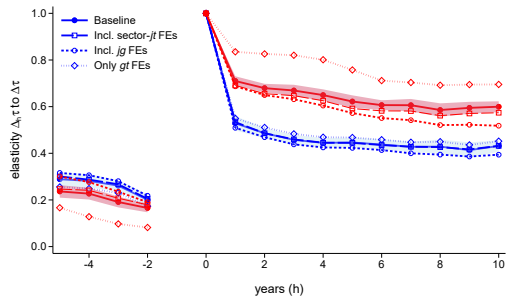


Reduced-form elasticities

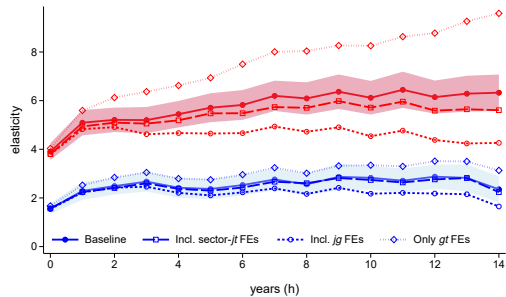


Across vs. within regimes: fixed effects

Tariff autocorrelations

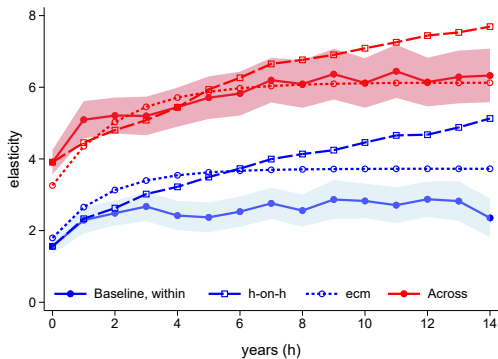


Reduced-form elasticities

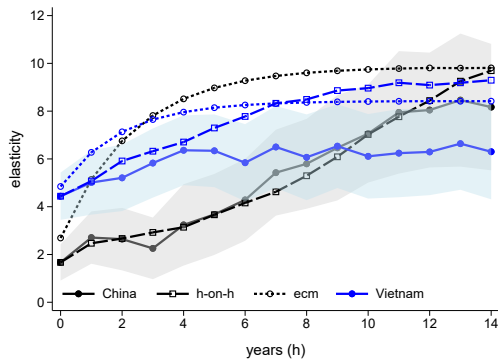


DiD vs. ECM

Across- vs. Within

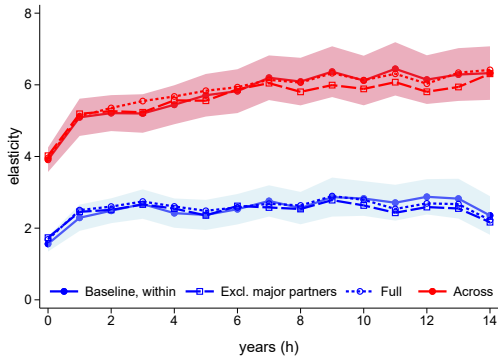


China & Vietnam

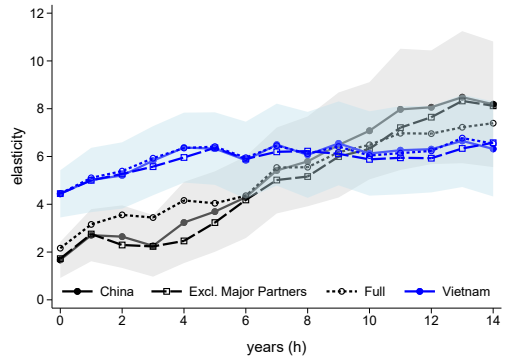


Sample design

(a) Across- vs. Within

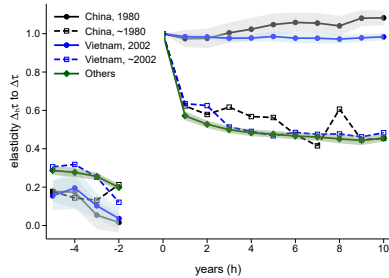


(b) China & Vietnam

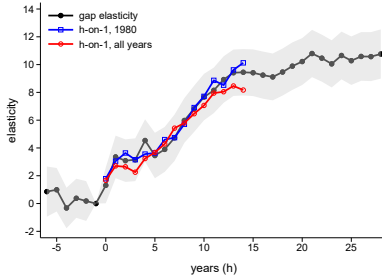


CHN & VNM: going from DiD to event study

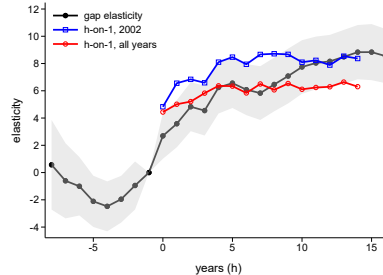
Tariff autocorrelation



Elasticities: China

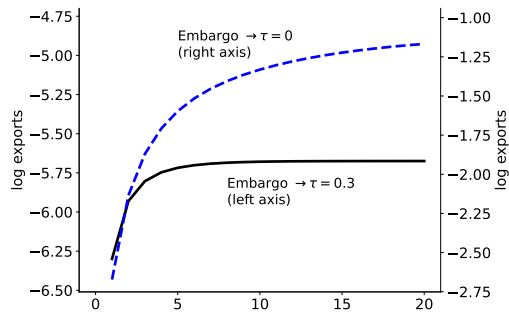


Elasticities: Vietnam

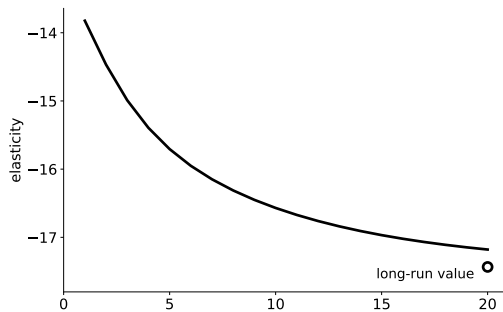


How starting from autarky affects elasticity estimates

Export volumes



Gap elasticity



Reconciling with other estimates

- ▶ Cross-sectional estimates: trade elasticity $\approx 4 - 6$
 - ▶ E.g. Simonovska-Waugh (2014), Caliendo-Parro (2015)
 - ▶ Our perspective: cross-sectional specifications mix SR and LR elasticities. Pool data from recent and distant reforms.
- ▶ Estimates from NAFTA using panel data
 - ▶ Romalis (2007): LR elasticity $\approx 6 - 11$
 - ▶ Khan-Khederlarian (2021): SR elasticity ≈ 3 , LR elasticity ≈ 9 . SR estimate corrected for anticipation of phased-in tariff cuts. Higher estimate w/o correction.
 - ▶ Larger than our across-regime estimates. We get similar results when distinguishing NTR→PTA transitions from other regime switches. See slide 30.
- ▶ Boehm et al. (2023): SR trade elasticity ≈ 0.7 , LR elasticity ≈ 2
 - ▶ Use only within-MFN tariff changes. More like $\omega = 0.5$ than $\omega = 1.0$. We find similarly low elasticities for these reforms.
 - ▶ Include *jgt* fixed effects. We can't because we only have one *i* (USA). But we find similar results when using sector-*jt* FEs.
 - ▶ Argue no pre-trends in trade \Rightarrow no anticipation. We show trade does not respond in advance unless expectations change. Stable expectations \Rightarrow no pre-trends, even if prob. of reform is high (i.e. $\omega = 0.5$).