Global Impacts of the US-China Trade War

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A 21st Century Trade War

- In 2018-19, US and China collectively raised tariffs on about $420b trade
  - US targeted 18% of imports (~2.5% of GDP)
  - China targeted 11% of imports (~3.6% of GDP)
  - 1930 Smoot-Hawley targeted 1.4% of GDP Irwin 98

- Tariffs remain elevated, plus:
  - industrial policy: protection of certain sectors, like EVs
  - national security: export bans on products with dual-use
  - executive order on “de minimis” shipments
  - Jan 20, 2025: 60% on China, 20% on RW?

- What are the economic impacts of the trade war?
  - US and China?
  - “bystander” countries?

Papers

1. Fajgelbaum, Goldberg, Kennedy, Khandelwal 20, *Return to Protectionism*, **Quarterly Journal of Economics**

2. Fajgelbaum & Khandelwal 22, *The Economic Impacts of the US-China Trade War*, **Annual Review Economics**

3. Fajgelbaum, Goldberg, Kennedy, Khandelwal, Taglioni 24, *The US-China Trade War & Global Reallocations*, **AER:Insights**

4. Fajgelbaum & Khandelwal 24*, The Value of De Minimis Imports*

5. Khandelwal 23, *The US-China Trade War and India's Export Response*, **India Policy Forum**

6. Ghose, Khandelwal, Taglioni, *Vietnam's Short- and Long-Run Exports Responses to the US-China Trade War*

Table 1: The 2018-19 Trade War

Panel A: Tariffs on U.S. Imports Enacted by U.S.						
Tariff Wave	Date Enacted	Products	2017 Imports		Tariff (%)	
		(# HS-10)	(mil USD)	(%)*	2017	Post-War
Solar Panels	Feb 7, 2018	8	5,782	0.2	0.0	30.0
Washing Machines	Feb 7, 2018	8	2,105	0.1	1.3	32.2
Aluminum	Mar-Jun, 2018	93	17,685	0.7	2.0	12.0
Iron and Steel	Mar-Jun, 2018	757	30,655	1.3	0.0	25.0
European Union	Oct 18, 2019	226	11,819	0.5	4.8	28.7
China	Jul '18 - Sep '19	16,403	352,563	14.7	4.1	26.4
Total		**17,495**	**420,608**	**17.6**	**3.7**	**25.8**

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Panel B: Retaliatory Tariffs on U.S. Exports Enacted by Trading Partners

Retaliating Country	Date Enacted	Products	2017 Exports		Tariff (%)	
		(# HS-10)	(mil USD)	(%)*	2017	Post-war
Mexico	Jun 5, 2018	232	6,746	0.4	9.4	27.9
Turkey	Jun 21, 2018	248	1,554	0.1	8.8	31.6
European Union	Jun 22, 2018	303	8,244	0.5	4.4	28.9
Canada	Jul 1, 2018	325	17,818	1.2	2.1	20.2
Russia	Aug 6, 2018	165	268	0.0	5.2	37.2
India	Jun 16, 2019	65	1,280	0.1	13.2	27.5
China	Apr '18 - Sep '19	7,757	98,016	6.3	8.7	19.5
Total		**8,400**	**133,926**	**8.7**	**7.7**	**20.8**

Visualizing Impacts

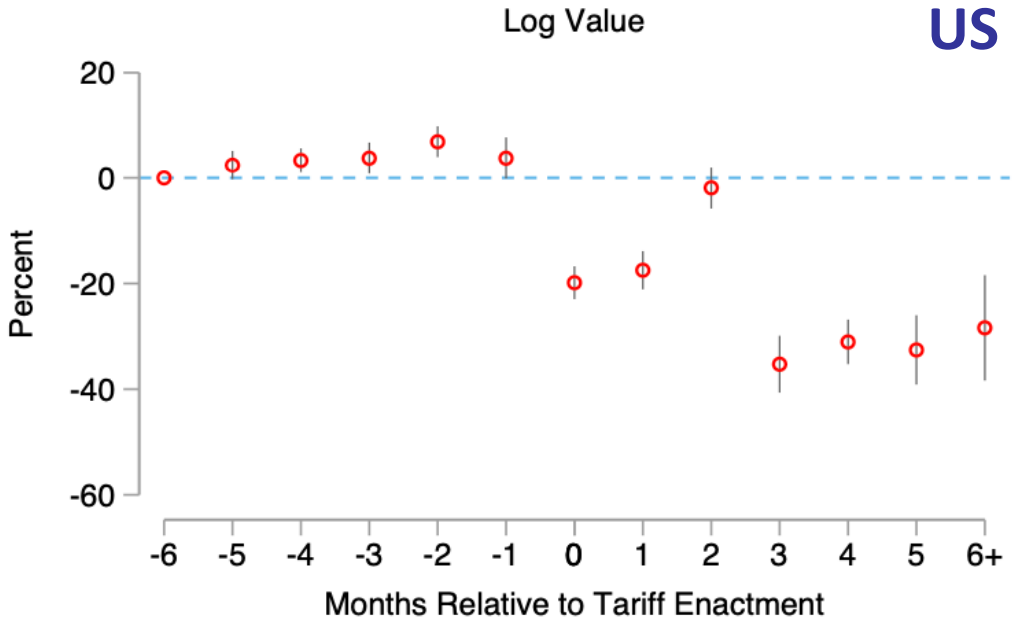
- What happened to trade?
  - Census data: US imports & exports, by product-origin-month
  - Tariff schedules: match tariff rates to product codes

- Event study

$$\ln y_{igt} = \alpha_{ig} + \alpha_{gt} + \alpha_{it} + \sum_j \beta_{0j} I(event_{igt} = j) + \sum_j \beta_{1j} I(event_{igt} = j) \times target_{ig} + \epsilon_{igt}$$

  - **i** origin, **g** HS10 product, **t** month
  - target: dummy if **ig** variety is targeted
  - import values, quantities, unit values (before- and after-tariff)

US Imports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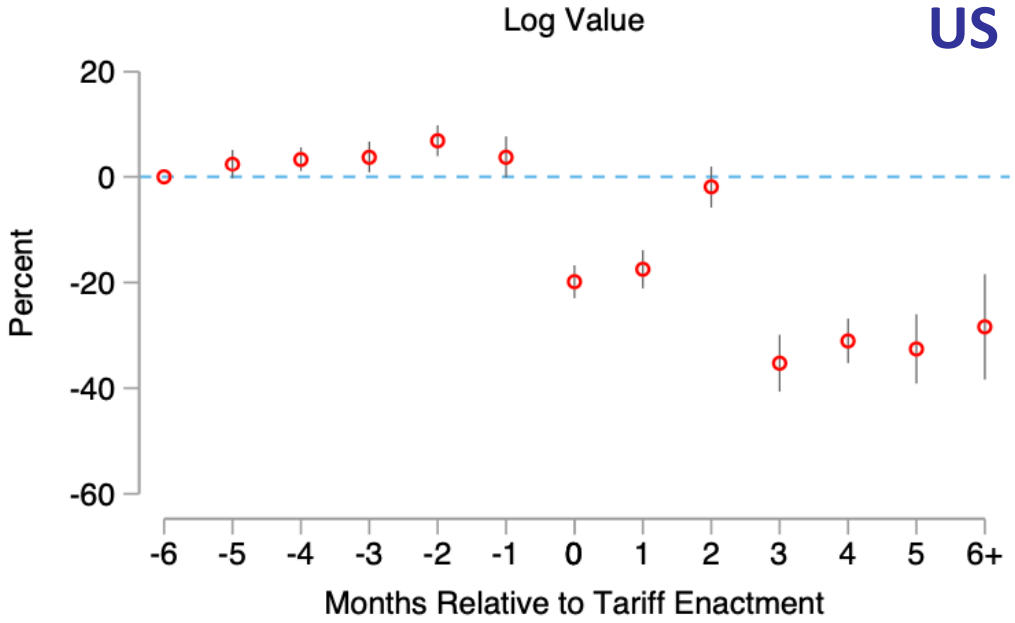
Months Relative to Tariff Enactment

US Imports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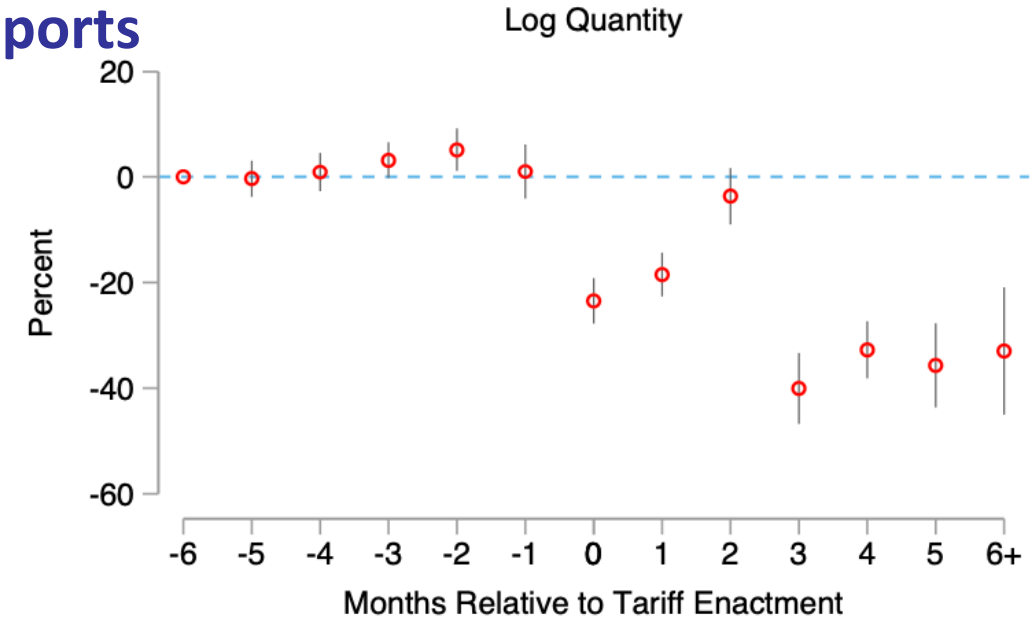
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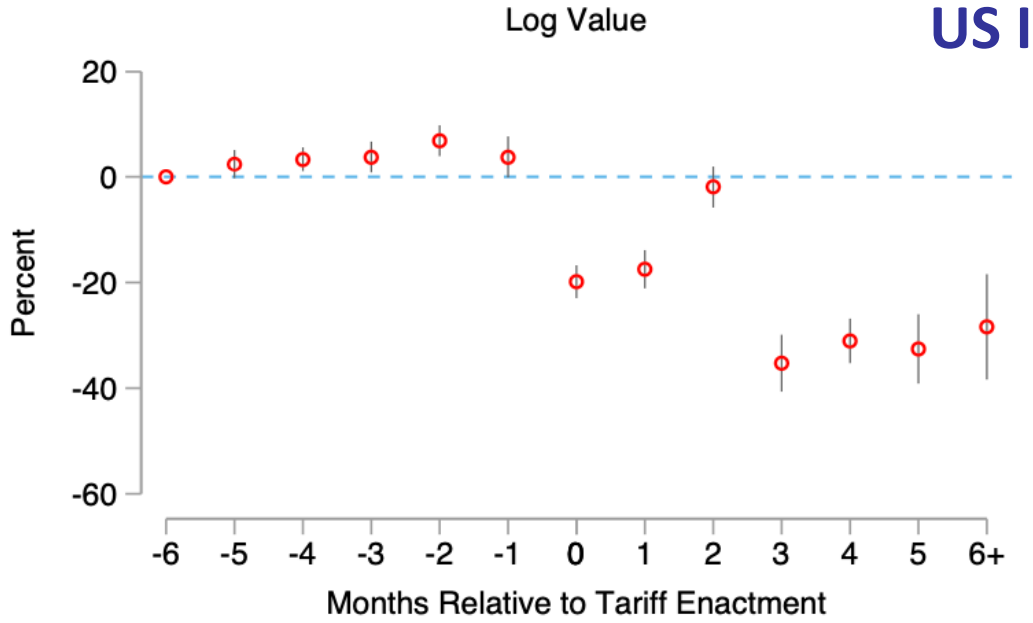
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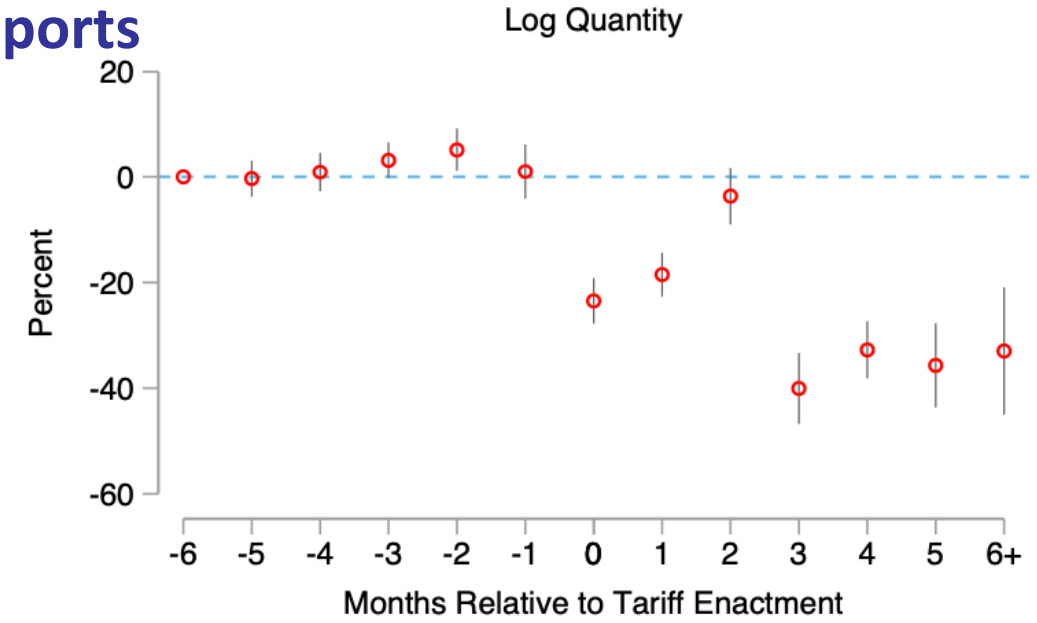
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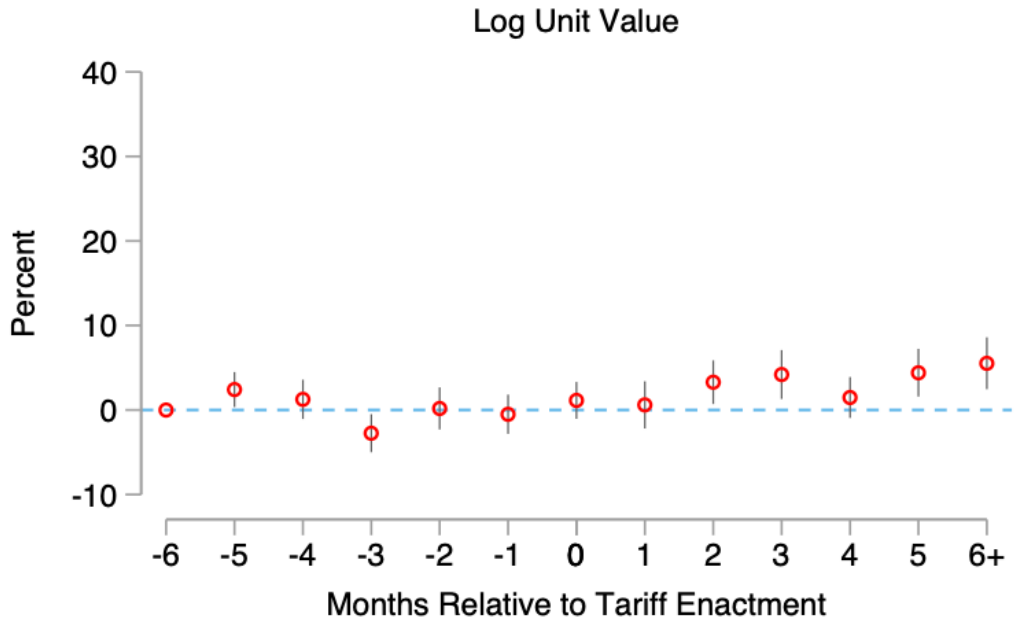
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Months Relative to Tariff Enactment

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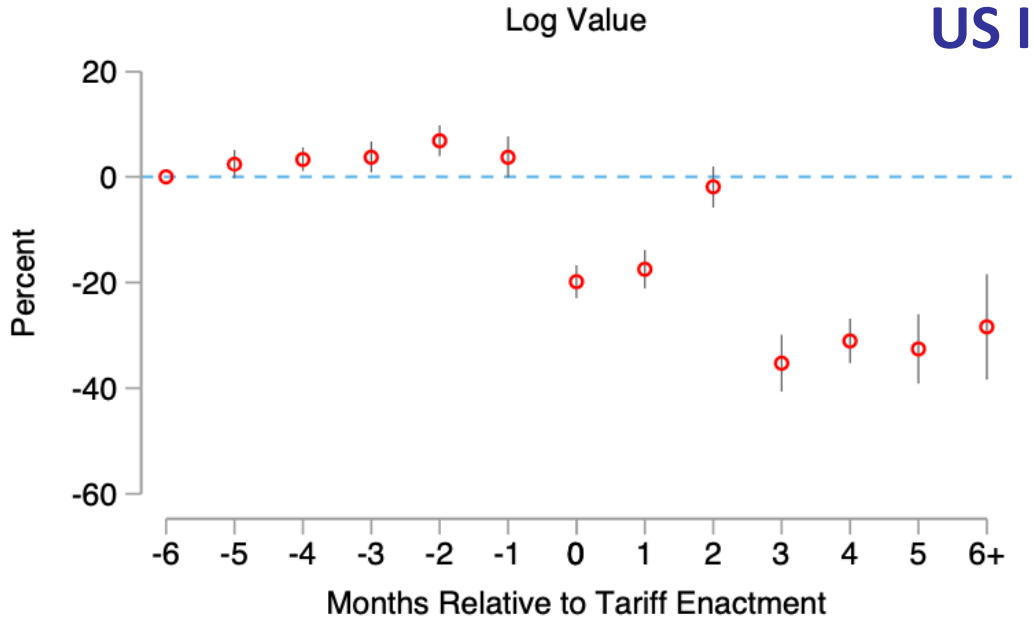
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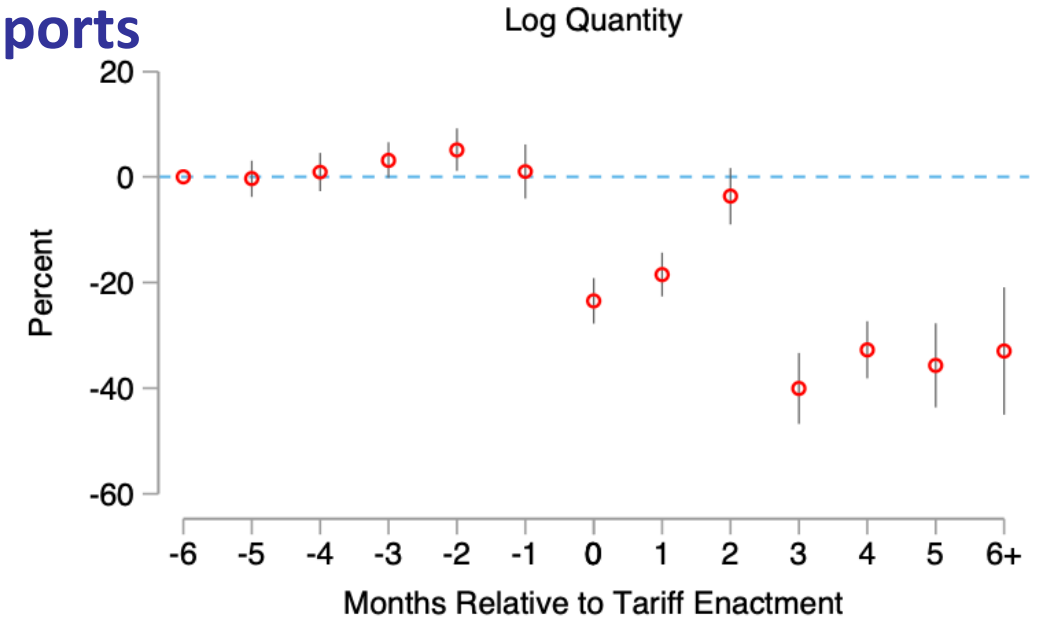
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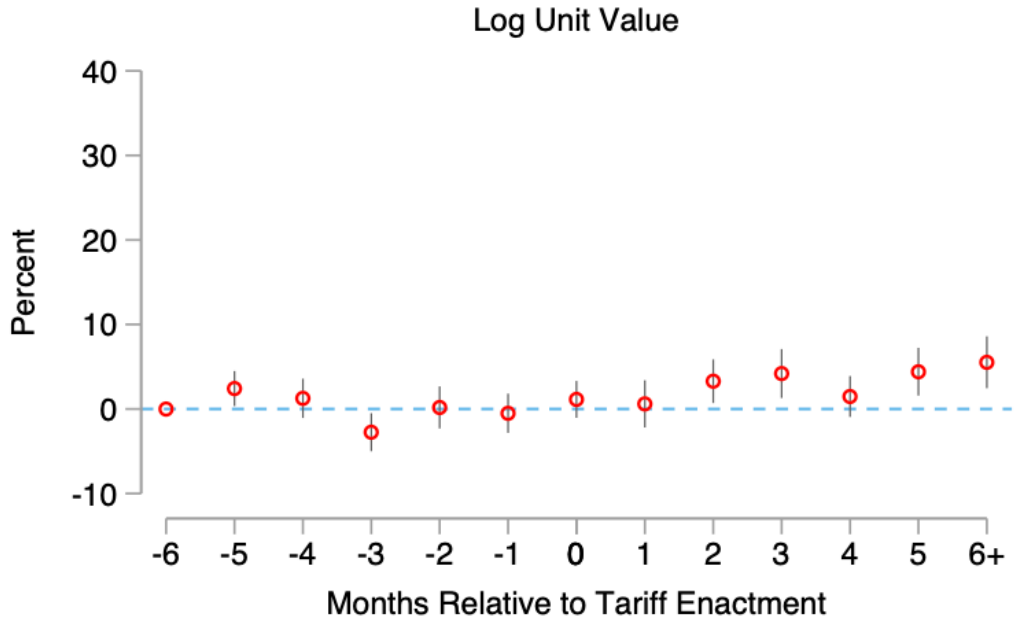
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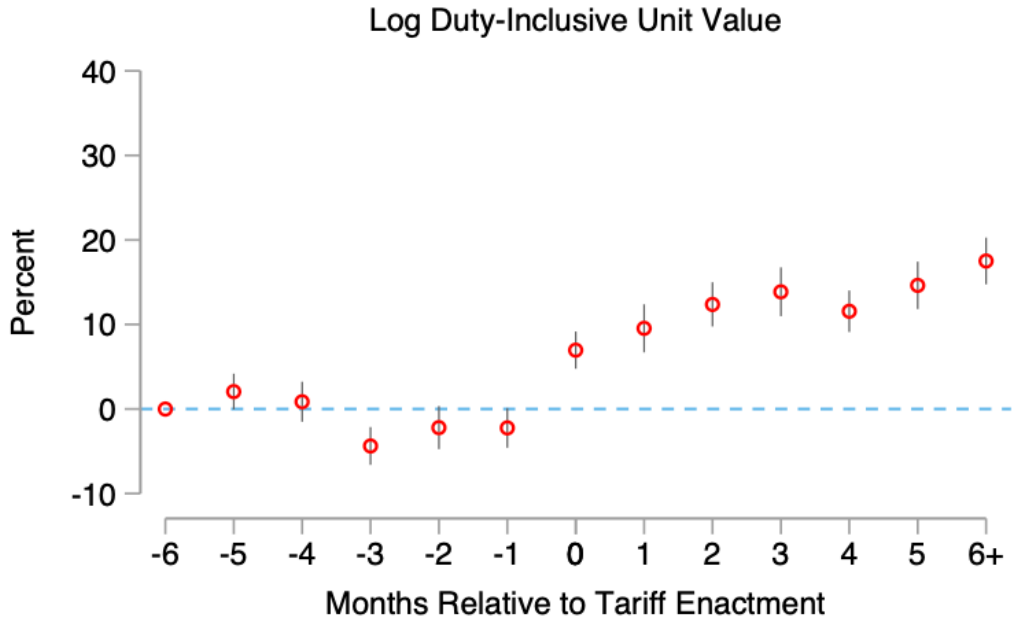
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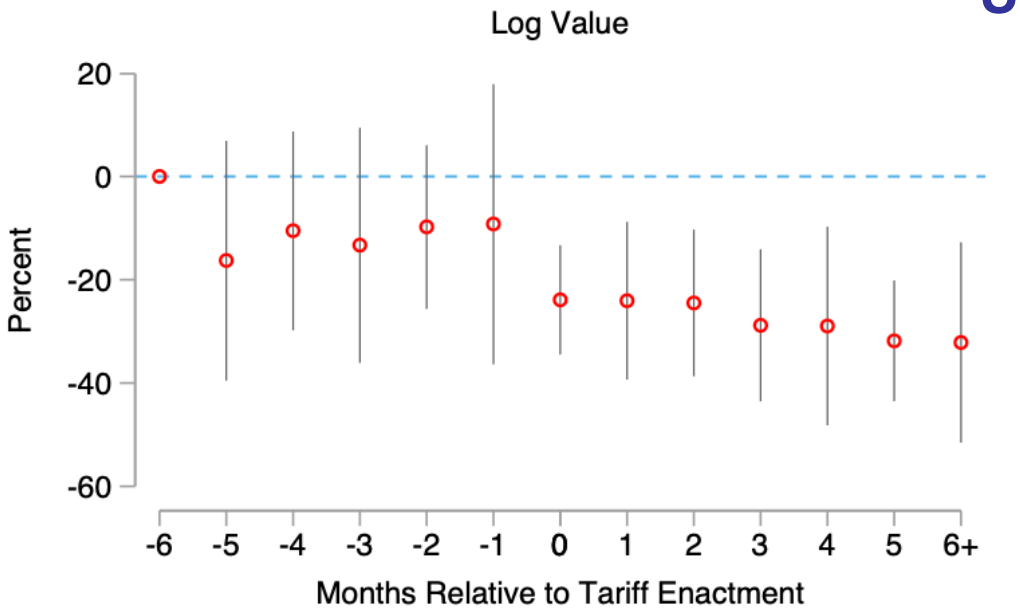
Months Relative to Tariff Enactment

US Exports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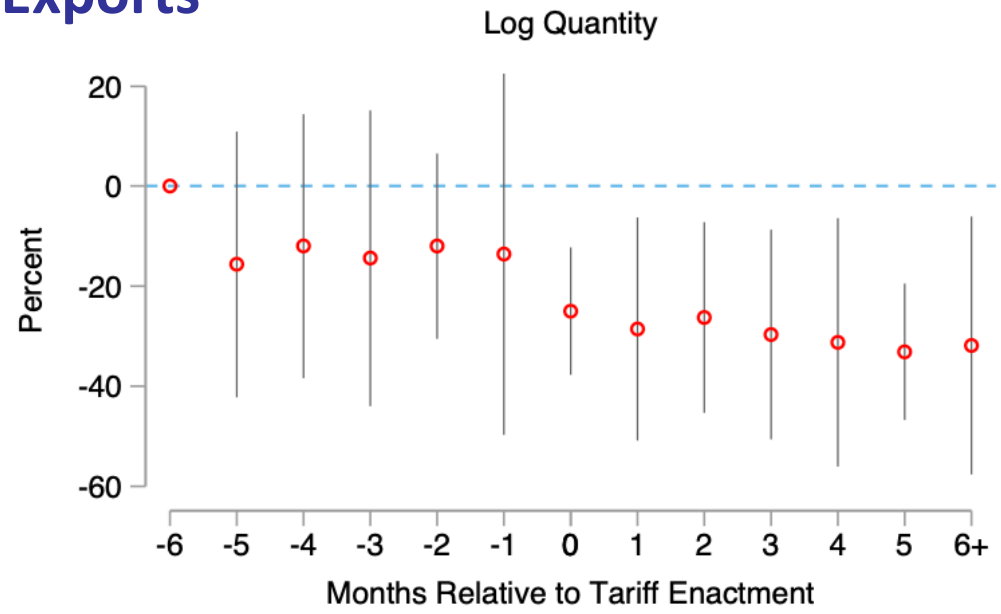
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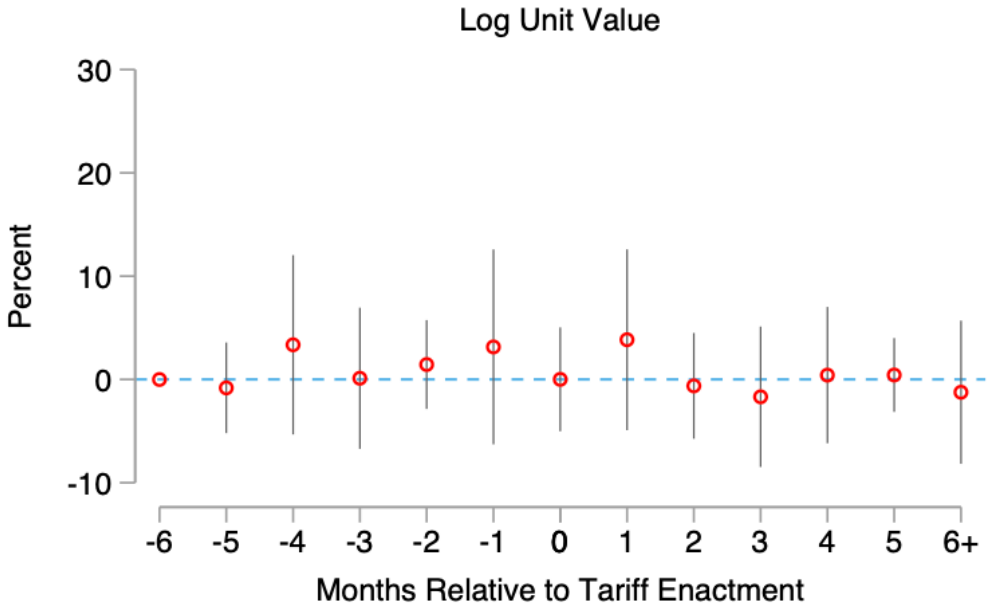
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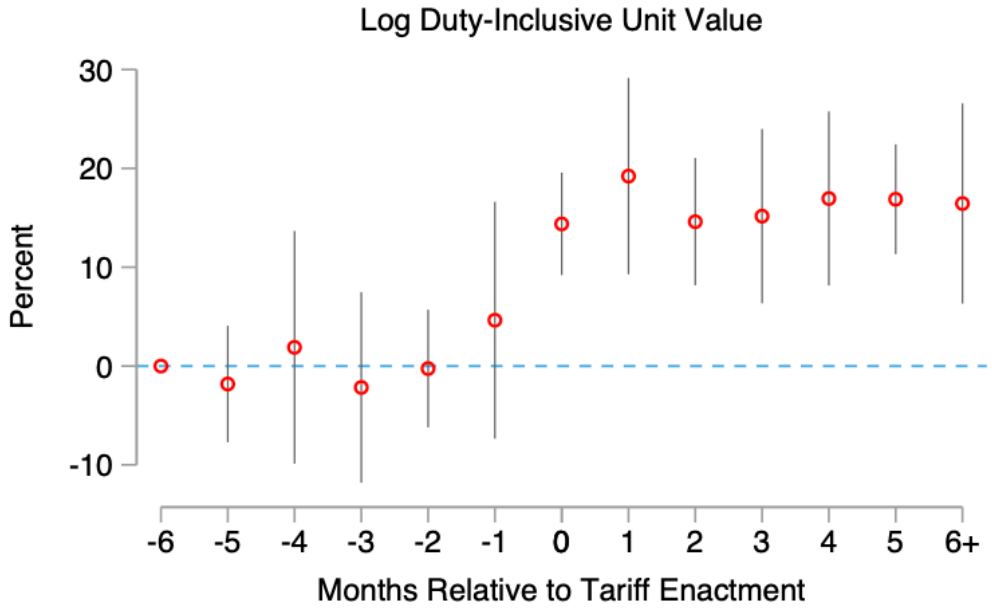
Log Duty-Inclusive Unit Value
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-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6+
Months Relative to Tariff Enactment

Aggregate Impacts

$$\text{EV} = -\boldsymbol{m}'\Delta\mathbf{p}^{\boldsymbol{M}} + \boldsymbol{x}'\Delta\mathbf{p}^{\boldsymbol{X}} + \boldsymbol{\Delta}\mathbf{R}$$

- With complete pass-through and no terms-of-trade effects, 1st order impact: $\text{EV} = -\boldsymbol{m}'\Delta\mathbf{p}^{\boldsymbol{M}}$
  - import share of GDP: ~15%
  - fraction of trade targeted: ~15%
  - average increase in import prices = average increase in tariffs = ~15%
  - $\text{EV} \approx 0.15^3 = 0.34\%$ GDP

- full GE model:
  - demand and supply elasticities estimated from tariff changes
  - terms-of-trade impacts at the sector level (because of a fixed factor)
  - input-output structure
  - retaliations
  - rebate tariff revenue

Tariff Propagation

- **Consumers**
  - 3-tier CES demand
    - κ (domestic vs imports)
    - γ (across imported products)
    - σ (across varieties within products)
- **Producers**
  - DRS (fixed factor = capital)
  - perfect competition
  - input-output structure
  - retaliations reduce foreign demand
  - foreign exporters' export supply (ω^*)
- **Government Revenue**
  - rebated back to consumers by region
- **Calibration**
  - 2016 economy
  - regional production structure
  - immobile labor

Estimating Equations for Key Parameters

- Imports and exports of product **g** from origin **i**

$$m_{igt} = m_{gt} a_{igt} \left((1 + \tau_{igt}) p^*_{igt} \right)^{-\sigma}$$

$$p^*_{igt} = z^*_{igt} m^{\omega^*}_{igt}$$

- Estimating equations

$$\Delta \ln m_{igt} = \alpha_{gt} + \alpha_{it} - \sigma \Delta \ln (1 + \tau_{igt}) p^*_{igt} + \epsilon_{igt}$$

$$\Delta \ln p^*_{igt} = \eta_{gt} + \eta_{it} - \omega^* \Delta \ln m_{igt} + \nu_{igt}$$

- If tariff changes ⊥ supply/demand shocks, can simultaneously recover both curves Zoutman et al 18
  - log-linear supply/demand system
  - tax levied on demand side
  - producer receives before-tariff price, consumer pays tariff-inclusive price

- Find $\sigma = 2.5$ and $\omega^* \approx 0$
- aggregate demand/instrument to estimate product elasticity ($\gamma = 1.5$) and sector elasticity ($\kappa = 1.19$)

Aggregate Impacts USA

Table 2: Aggregate Impacts

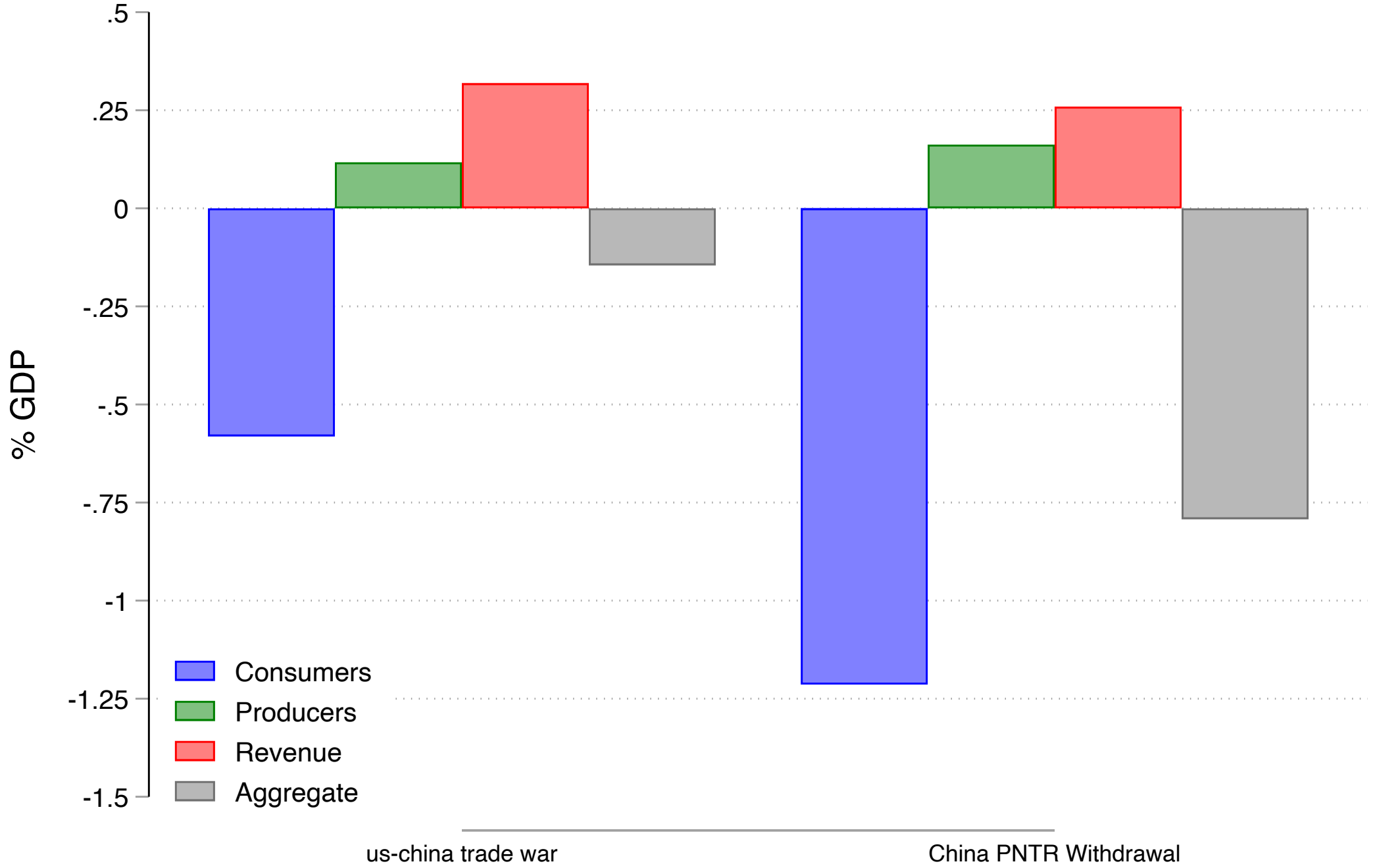
	EV^M	EV^X	ΔR	EV
	(1)	(2)	(3)	(4)
	2018-19 Trade War			
Change ($ b)	-114.2	24.3	65.0	-24.8
	[-121.8,-106.5]	[15.4,35.2]	[59.0,70.2]	[-39.4,-8.8]
Change (% GDP)	-0.61	0.13	0.35	-0.13
	[-0.65,-0.57]	[0.08,0.19]	[0.32,0.38]	[-0.21,-0.05]

Aggregate Impacts China

Table 8: Aggregate Impacts

	EV^X	EV^M	ΔR	EV
	(1)	(2)	(3)	(4)
2018–2019 trade war				
change ($ b)	-32.968	-6.906	1.976	-37.898
	[-45.159, 0.786]	[-15.524, 0.874]	[1.360, 3.708]	[-52.282, -3.153]
change (% GDP)	-0.272	-0.057	0.016	-0.312
	[-0.372,0.006]	[-0.128, 0.007]	[0.011,0.031]	[-0.431, -0.026]

Chang et al 21


.5
.25
0
-.25
-.5
-.75
-1
-1.25
-1.5
% GDP
Consumers
Producers
Revenue
Aggregate
us-china trade war
China PNTR Withdrawal

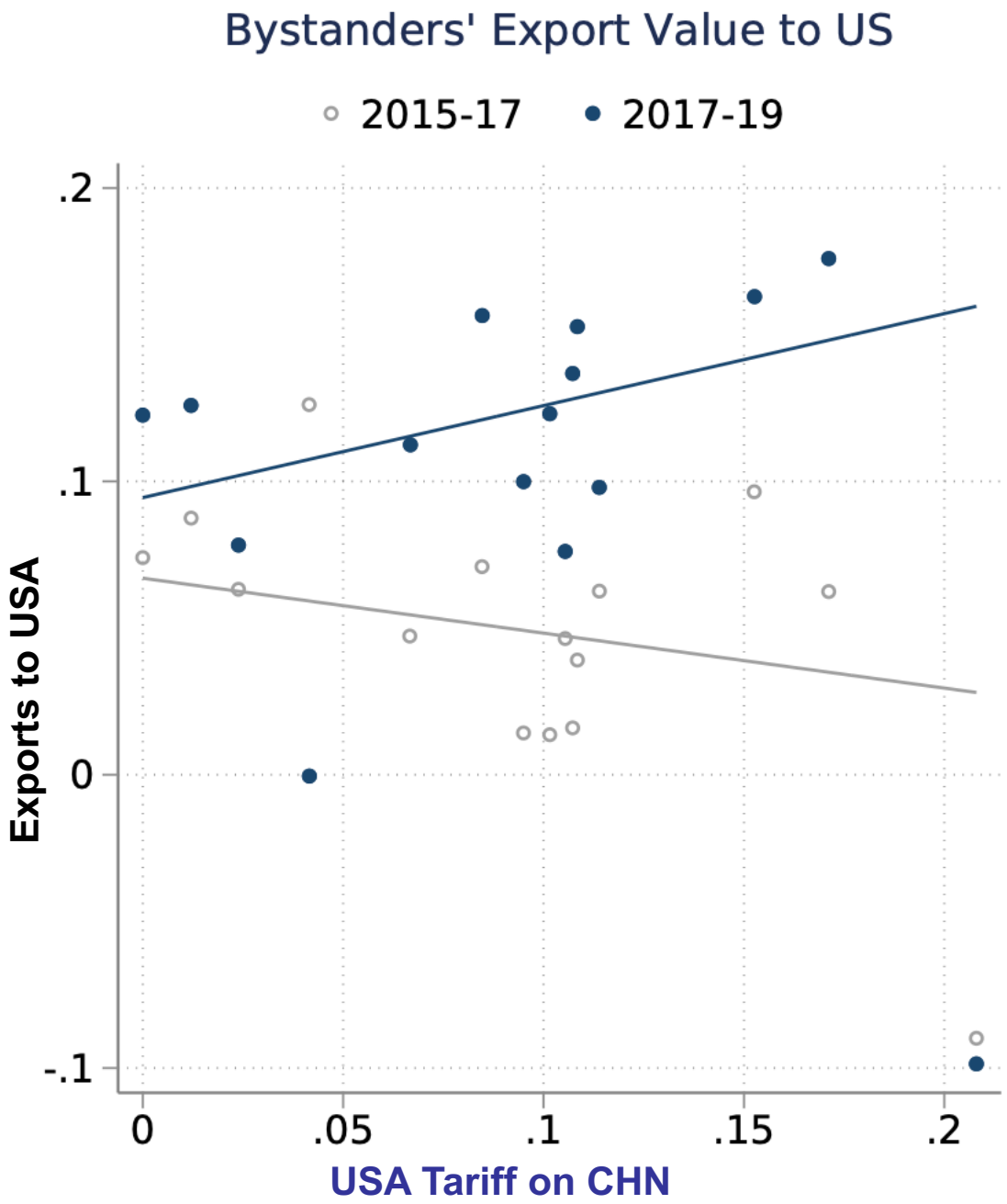
What about Bystander Countries?

- Examine product-level exports to USA, CHN, RW
  - 2018-19 exports in HS6 products
  - Four sets tariffs: (USA → CHN, USA → RW) and (CHN → USA, CHN → RW)

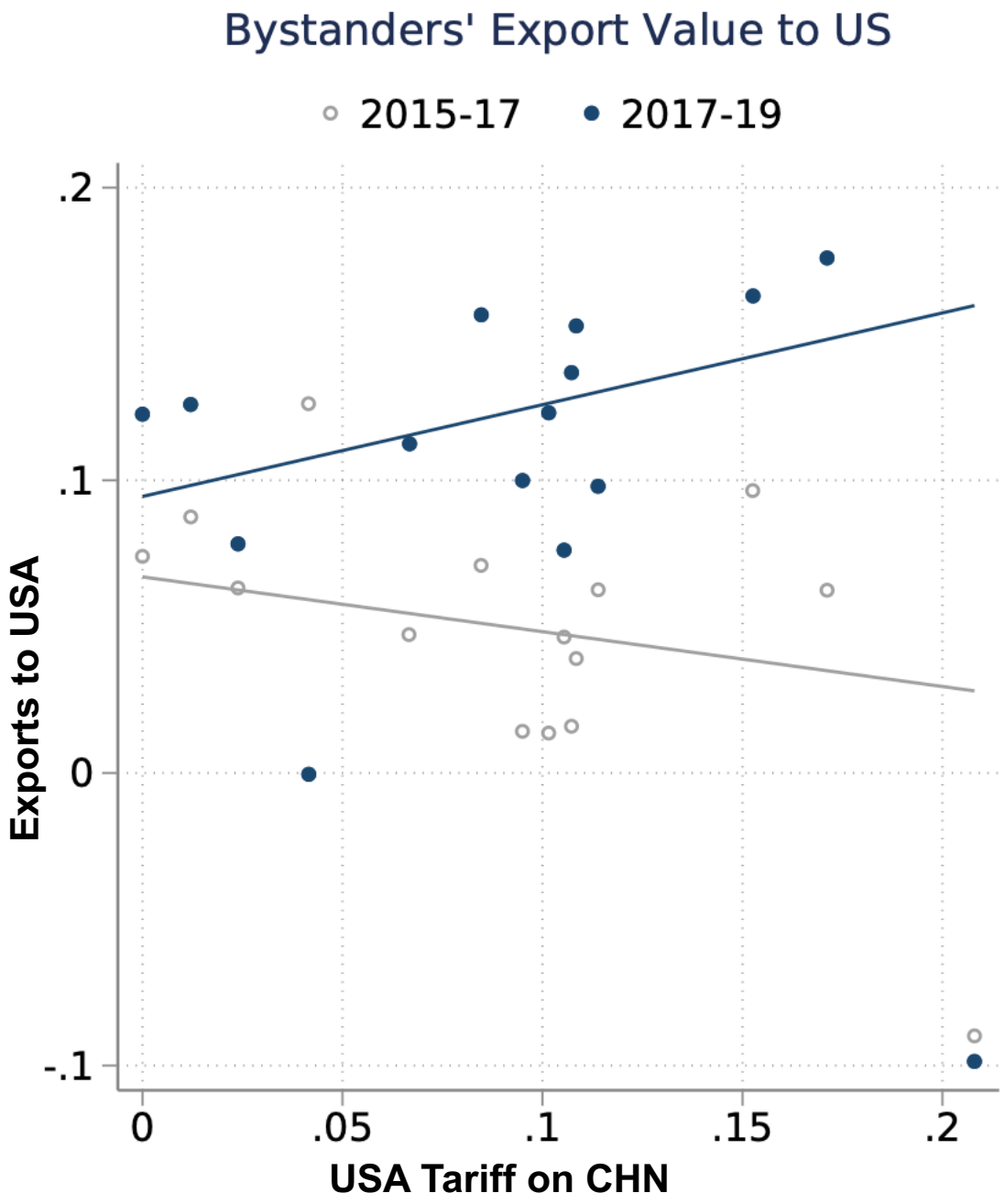
- Basic idea:
  - For each country, compare growth in taxed relative to untaxed products
  - model guides interpreting of responses:
    - Exports patterns to USA/CHN isolates substitute/complementarity
    - Exports patterns to RW isolates upward/downward supply curves

- Relative to untaxed products, bystander exports:

↗ to USA ↔ to CHN ↗ to RW



Pre-period: β=-0.19 (0.10). Post-period: β=0.31 (0.10).



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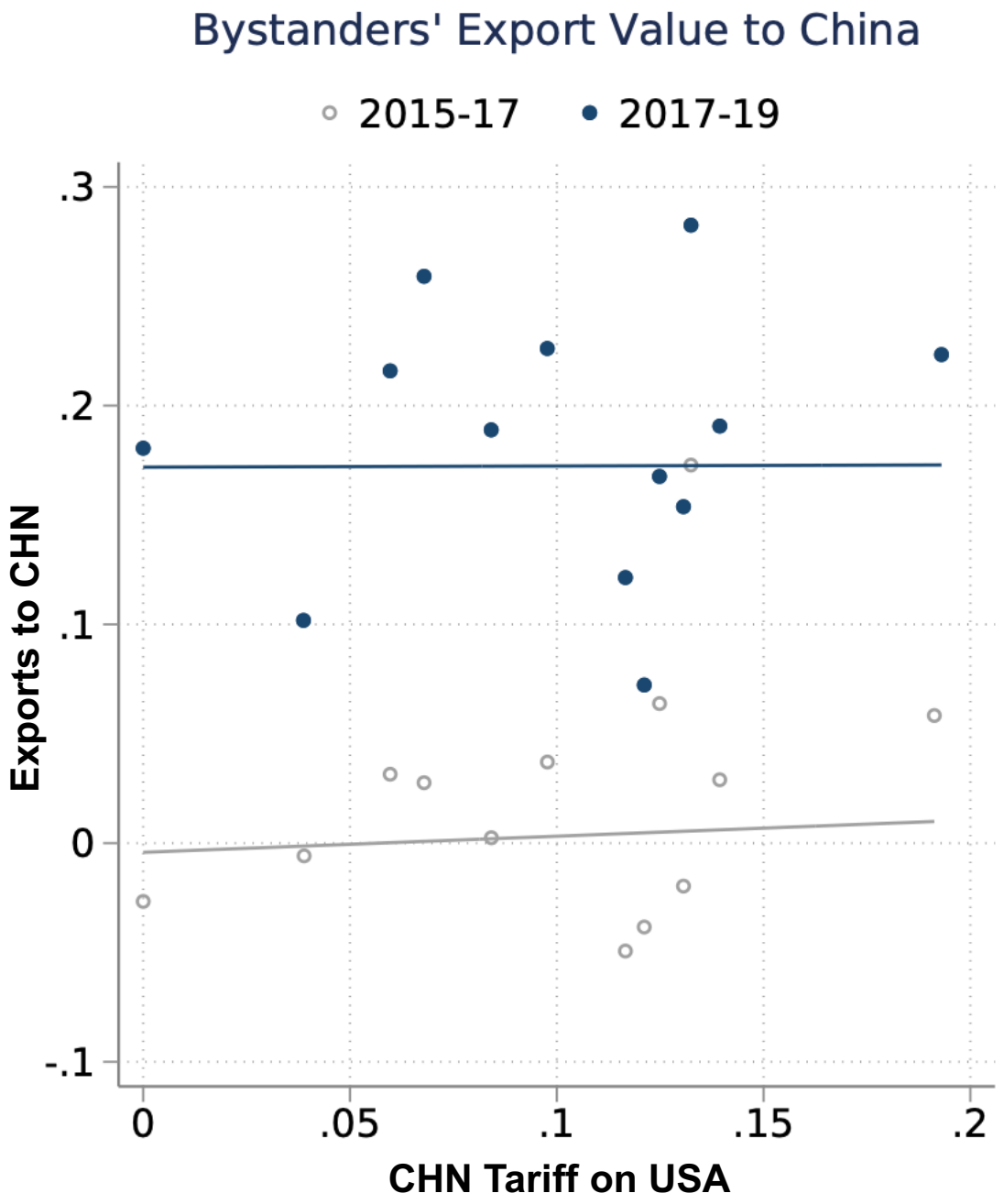
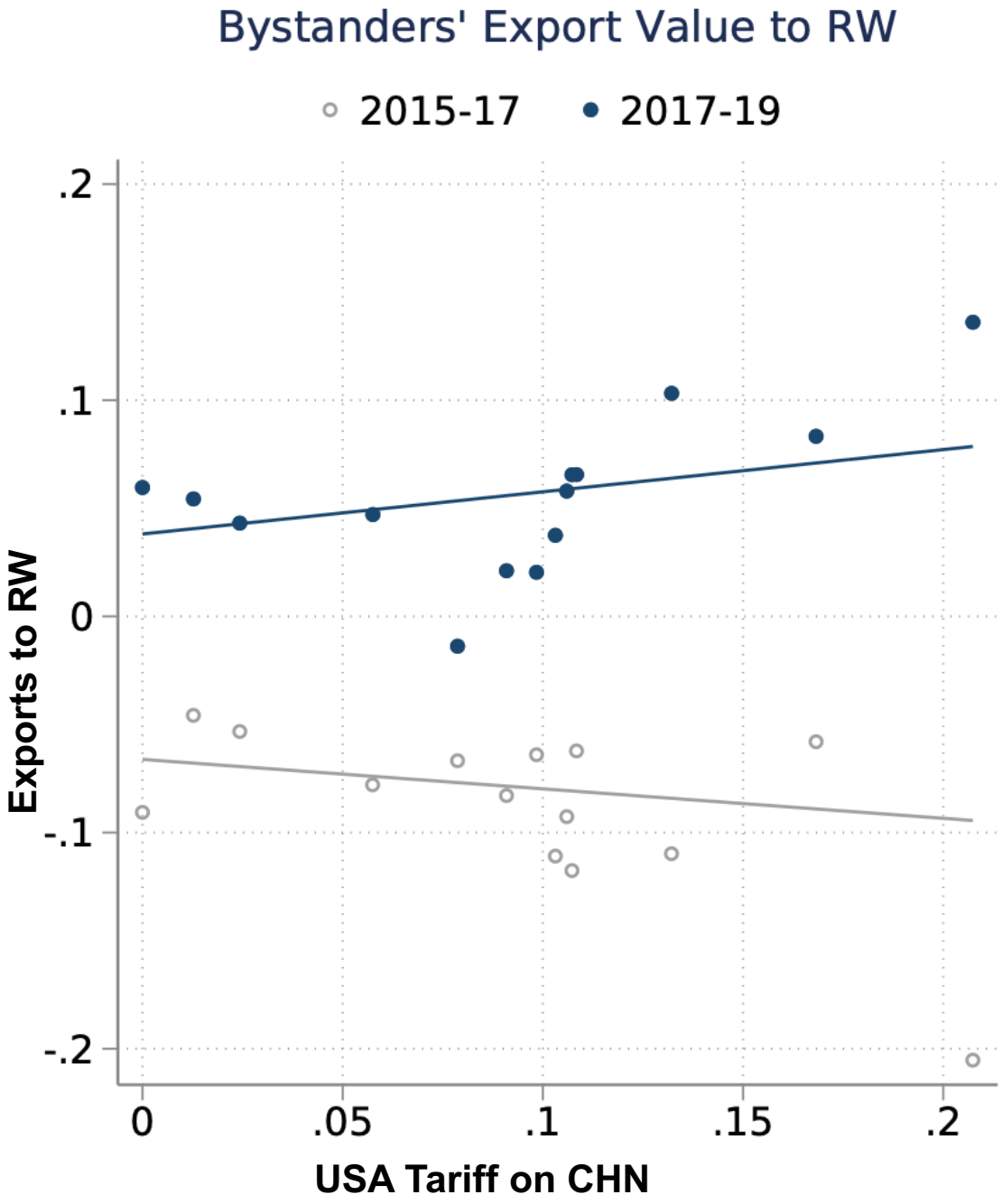
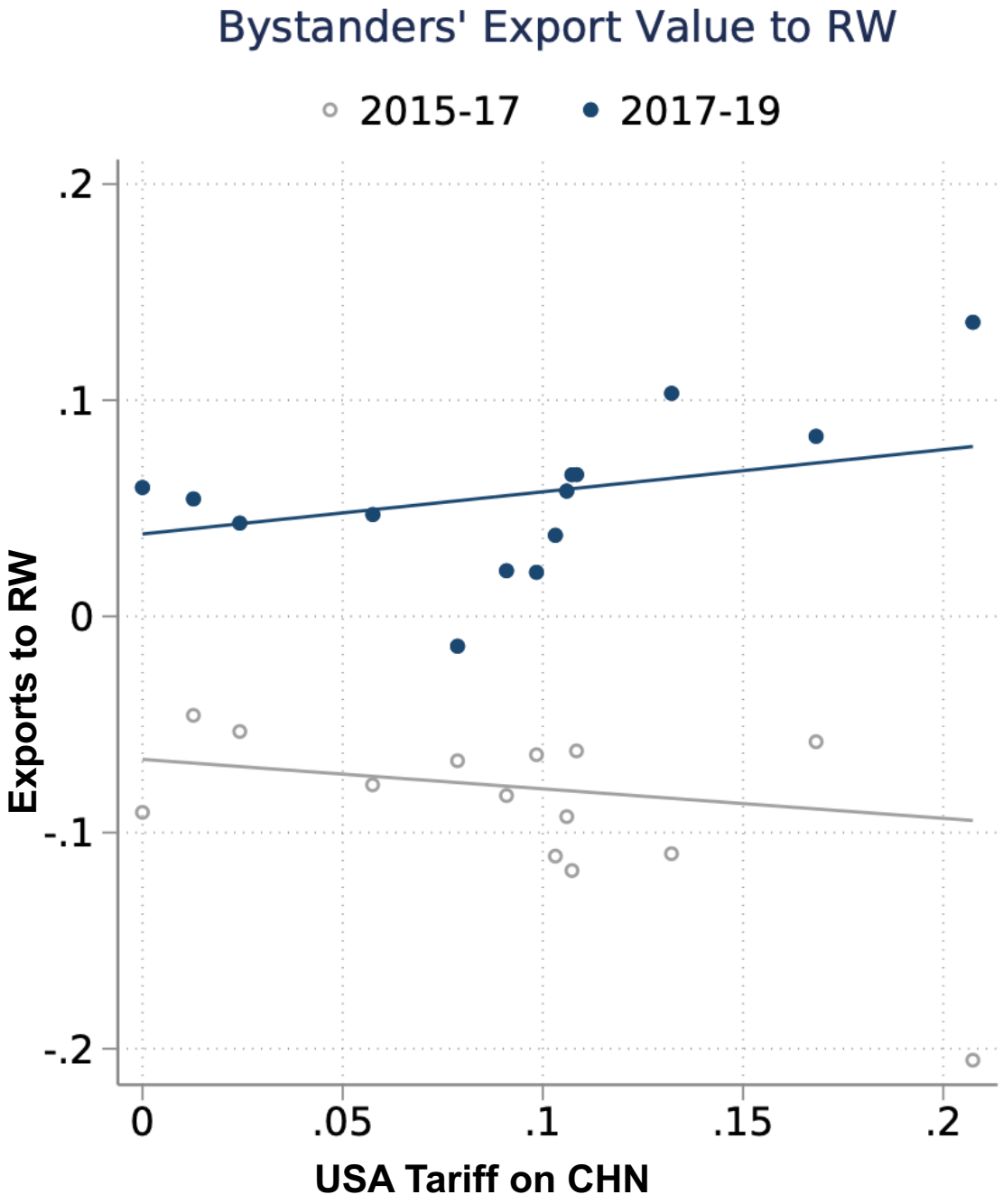


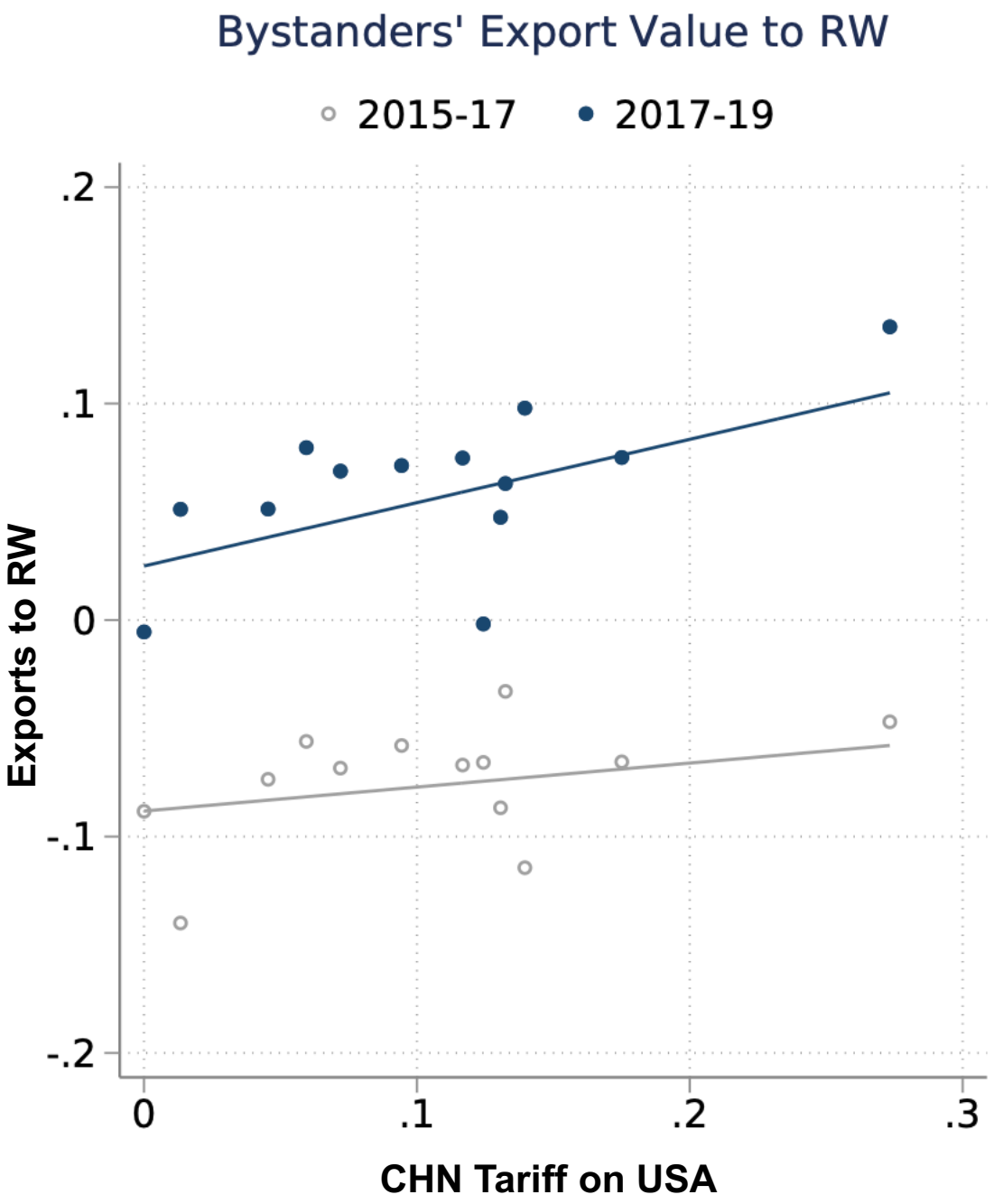
Pre-period: β=0.07 (0.18). Post-period: β=0.01 (0.19).



Pre-period: β=-0.14 (0.08). Post-period: β=0.20 (0.08).



Pre-period: β=-0.14 (0.08). Post-period: β=0.20 (0.08).



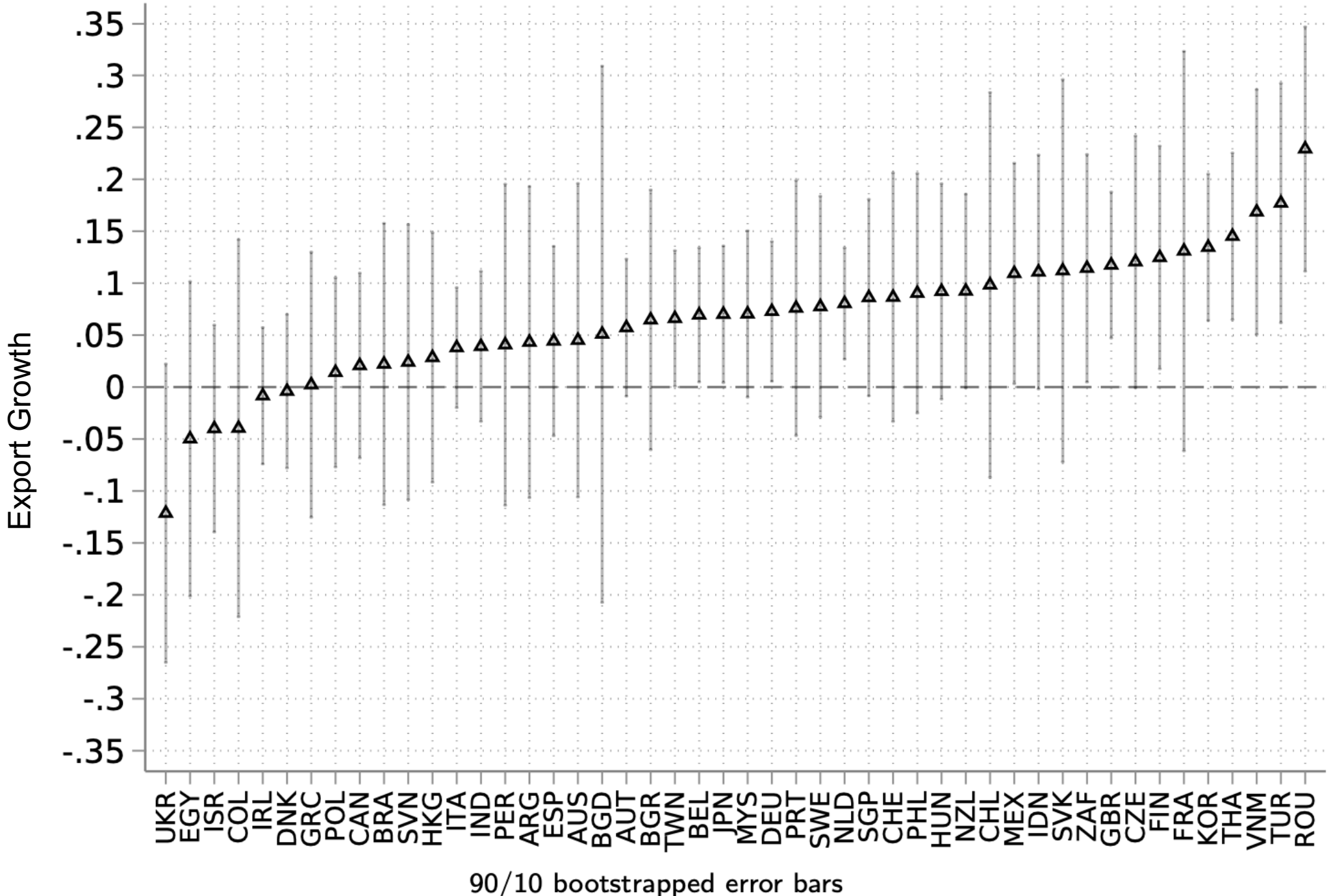
Pre-period: β=0.11 (0.08). Post-period: β=0.29 (0.08).

Heterogenous Tariff Responses

$$\Delta \ln X_{ig}^{n} = \beta_{1ig}^{n} \Delta \ln T_{CH}^{US} + \beta_{2ig}^{n} \Delta \ln T_{US}^{CH} + \beta_{3ig}^{n} \Delta \ln T_{i}^{US} + \beta_{4ig}^{n} \Delta \ln T_{i}^{CH} + controls + \epsilon_{ig}$$

- X_{ig}^{n} exports of product **g** from **i** to **n**
- Four tariffs:
  - $\Delta \ln T_{CH}^{US}$: USA tariff on CHN
  - $\Delta \ln T_{US}^{CH}$: CHN tariff on USA
  - $\Delta \ln T_{i}^{US}$: USA tariff on **i**
  - $\Delta \ln T_{i}^{CH}$: CHN tariff on **i**
- Tariff responses $(\beta_1, \beta_2, \beta_3, \beta_4)$ depend on:
  - country fixed effect
  - sector fixed effect
  - variety size
- Estimate this regression separately to USA, CHN, RW
- Aggregate predicted responses to world exports

$$\Delta \ln \widehat{X_{i}^{WD}} = \sum_{g} \sum_{n} \lambda_{ig}^{n} \begin{pmatrix} \widehat{\beta_{1ig}} \Delta \ln T_{CH}^{US} + \widehat{\beta_{2ig}} \Delta \ln T_{US}^{CH} \\ + \widehat{\beta_{3ig}} \Delta \ln T_{i}^{US} + \widehat{\beta_{4ig}} \Delta \ln T_{i}^{CH} \end{pmatrix}$$


Export Growth
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UKR EGY ISR COL IRL DNK GRC POL CAN BRA SVN HKG ITA IND PER ARG ESP AUS BGD AUT BGR TWN BEL JPN MYS DEU PRT SWE NLD SGP CHE PHL HUN NZL CHL MEX IDN SVK ZAF GBR CZE FIN FRA KOR THA VNM TUR ROU
90/10 bootstrapped error bars

The Rapid Rise of “de Minimis” Imports

- §321 of 1930 Tariff Act: can import $800/consignee-day duty-free, minimal customs burden

- “de minimis” channel grew by 1000x in a decade
  - 2012: 110m shipments, $50m
  - 2023: 1b shipments, $54b
  - 7.3% of consumer imports, 19.2% US e-commerce

- Driven by
  - “direct-to-consumer” trade, integral to online retailers (Temu, Shein)
  - higher tariffs

- Controversial
  - active debates over de minimis exemptions: EU, UK, ZAF, PHL, TUR, BRA, CHL
  - USA: 5 bi-partisan Congressional Bills, 9/24 White House Executive Order

Takeaways

- Evidence suggests:
  - high pass-through to US economy
  - increased incentive to shift consumer goods through §321
  - minimal, if any, gains to producers
  - global trade has reallocated, creating net trade opportunities for bystander countries

- A lot more work is needed!
  - other policies: export controls, tariff exemptions, firm-level mechanics driving reallocations
  - micro-level price data, dig deeper into pass-through results
  - incidence along to supply chain → industry analyses
  - factors driving bystanders' reallocation

- Higher tariffs on the horizon, buckle up…