Direct-to-Consumer Trade and the Value of De Minimis

Preliminary

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Motivation

- US tariffs on Chinese imports have increased dramatically since 2018

- Section (§) 321 of the 1930 Trade Act
  - $800/person per day can arrive duty-free and w/ minimal customs burden

- Use of "de minimis" import channel has exploded in recent years. In 2022:
  - 685m shipments entered through §321 vs 39.1m formal entries
  - §321 imports are 6% of consumer imports, and 18% of E-commerce sales
  - in 2023,1 *billion* §321 shipments, collectively valued at $49.4b

- Driven by
  - emergent "direct-to-consumer" trade integral to online retailers/platforms
  - higher tariffs

§321 Importance in US Imports

	CBP Official Statistics		US Consumer Spending	
year	§321 value ($b) (1)	§321 BOLs (mil) (2)	consumer imports (%) (3)	e-commerce (%) (4)
2012	0.05	110.5	0.01%	0.1%
2013	0.07	117.9	0.01%	0.1%
2014	0.7	122.8	0.1%	1%
2015	1.6	138.9	0.3%	2%
2016	9.2	224.0	1.6%	9%
2017	13.0	332.3	2.1%	11%
2018	29.2	410.6	4.4%	22%
2019	56.2	503.1	8.9%	37%
2020	67.0	636.7	9.4%	30%
2021	43.5	771.5	5.3%	18%
2022	46.5	685.4	6.0%	18%
2023	49.4	1,000.0		

Notes: Panel reports official statistics for §321 imports (columns 1-2) obtained through a FOIA, CBP Publication 2036-1022 and CBP E-Commerce Statistics. Column 3 reports the share of §321 import values to aggregate US spending on consumer imports (excluding autos and food), and column 4 reports the share relative to aggregate E-commerce sales. The latter two statistics are from Census and pulled the FRED database. BOLs means bill of ladings.

Research Questions

- What are the aggregate consequences of allowing for §321 imports?
- Which consumers benefit more vs less from §321 imports?

De Minimis Trade Policy: Key Forces

- What are the economic impacts of a minimum value threshold for trade policy?
- Shipments above threshold face tariffs and customs processing fees:
  - standard tariff distortion: tariffs make imports more expensive
  - fees could be sizeable relative to value of cheap packages
- However, a de minimis tax notch is a novel source of gains from trade
  - high-price firms bunch at notch, thereby lowering consumer prices
  - a finite de minimis threshold could be preferred to free trade
- Tradeoffs vary across consumer groups based on their de minimis expenditures

Data

- Census data exclude de minimis shipments (contain shipments above $2000)
- We analyze international shipments into the US handled by three carriers
  - shipments range from $0 to ∼$100m
  - analyze 414m shipments, valued at $709b
- in 2021, these carriers are 36.1% of total §321 value and 17.0% of §321 shipments
- have obtained 1w of §321 shipments from CBP through FOIA, 2017-22
  - can compare carrier data with a snapshot of the universe of §321 shipments
  - future versions will use CBP sample to adjust welfare estimates

Research Design

- Framework
  - heterogeneous consumers vary in expenditures over DM goods by origin
  - heterogeneous exporters operate subject to de minimis rules
- Quantification requires two key empirical moments:
  - density of shipments over values by consumer group (e.g., zipcode income)
  - change in density from pre-2016 ($200 threshold, low tariffs) to post-2016 ($800 threshold, high tariffs)
- Changes in notches and tariffs identify key elasticities:
  1. within origins across package values
     - ★ exploit change in bunching at the notch Kleven 16
  2. across origins facing different US tariffs future versions

Preliminary Findings

1. §321 spending as a share of income is U-shaped
   - the lowest and highest income zips have highest spending shares
   - §321 spending shares higher in zips with a high percentage of non-white hh
   - within §321, lower-income zipcodes import more from China
2. Simulate eliminating §321: direct shipments $\leq$\$800 face tariffs and processing fees
   - prices rise 1.5% (or 2.1% with higher fee)
   - increased consumer costs: \$33.9/yr (or \$46.8/yr with higher fee)
     - ★ compare to ↑ \$160/yr costs from 2018 trade war tariffs FKGT 2020
   - accounting for tariff gains, welfare loss per capita: \$14.9/yr
3. Distributional impacts from policy experiment:
   - as % of income, lowest & highest median income zips lose more than middle
   - zipcodes with higher share of non-white households lose more
   - if tariff revenue rebated equally, eliminating §321 is regressive:
     - ★ zipcodes with highest white share gain
     - ★ zipcodes with highest non-white share lose

- future versions
  - calibrate to sample of shipments obtained from CBP
  - estimate impacts across more demographic characteristics (pop density, broadband access)

Road Map

- §321 Policy, Data and Descriptive Statistics
- Framework
- Moments and Estimation
- Policy Experiment

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§321 Import Policy

- Most countries have a de minimis policy (avg $145)
- US streamline procedures for two types of low-value shipments:
  - informal entries ($801-$2500)
    - ★ subject to tariffs & merchandise processing fees ($2.22, $6.66, or $9.99)
    - ★ CBP Form 7501
    - ★ immediately released by CBP, unlike formal entries (>$2500)
  - §321 entries ($0-$800)
    - ★ not subject to tariffs or processing fees
    - ★ minimal paper work (simply present BOL or commercial invoice)
- §321 provision
  - $800 limit per consignee per day (change from $200 in March 2016)
  - CBP captures origin, value, address, item descriptions, no HS codes
  - cannot break up a single order across shipments that span multiple days
- §321 shipments not present in Census data
  - Census data pulls from CBP Form 7501, so captures shipments above $2000

Carrier Data

- Carriers' universe of international air shipments to US
  - date, origin, value, address/postal code, items description, entry code
  - for >\$800 shipments, have HS codes
  - 2014-22, but incomplete coverage across carriers
  - across years and carriers, observe 414m shipments valued at \$709b
  - shipments delivered to virtually all ZCTAs

- Sample also contains shipments to non-US destinations trans-shipped through US
  - entry codes: 62 "transportation & exportation" 63 "immediate export"

- Representativeness:
  - 85.7% of §321 shipments enter by air, and 29.9% by private carriers CBP
  - in 2021, our data are:
    - ★ 17.0% of total §321 shipments
    - ★ 36.1% of total §321 value
  - can benchmark to sample of ≤\$1500 shipments obtained via a FOIA from CBP for 1 week in 2017-22

- Zipcode median income, population, demographics from Michigan ICPSR

Carrier Data

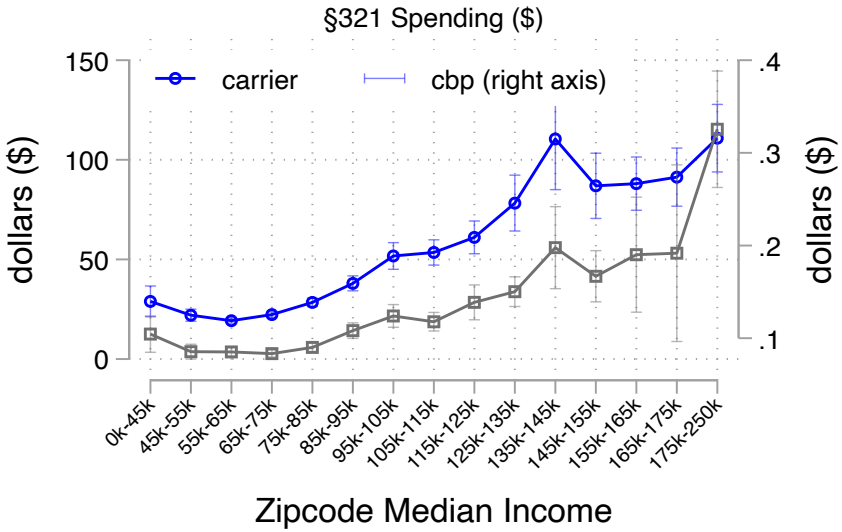
		§321 Shipments to USA		Non §321 Imports [$801,$5,000]		Shipments to OECD ($\leq$$5,000)	
year	carrier	§321 value ($b)	§321 BOLs (m)	value ($b)	BOLs (m)	value ($b)	BOLs (m)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
2014	A	0.2	7.0	1.2	1.1	0.2	0.4
2015	A	0.6	16.1	2.7	2.6	0.5	3.3
2016	A	1.4	18.3	2.4	1.4	0.5	3.4
2017	A	2.8	30.0	3.5	1.7	0.8	5.3
2018	A	3.6	34.3	4.3	2.0	1.0	6.2
2019	A	4.2	36.5	4.6	2.1	1.1	6.5
2020	A B* C	7.9	68.5	8.5	3.9	2.2	11.1
2021	A B C	15.7	130.9	17.3	8.0	2.8	11.0
2022	B* C*	3.6	31.3	5.1	2.4	0.01	0.01

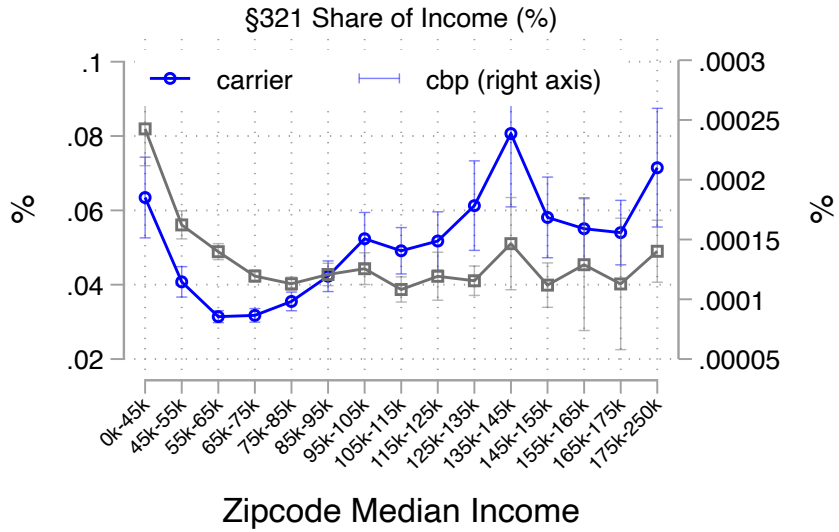
Notes: The table reports summary statistics from the carrier data. Column 1 reports the source carrier; "*" denotes incomplete data that year. Columns 2-3 report total value and BOLs for §321 imports into US. Columns 4-5 report stats for non-§321 imports under $5,000 . Columns 6-7 report statistics of transshippments under $5,000 handled by the carriers to OECD.

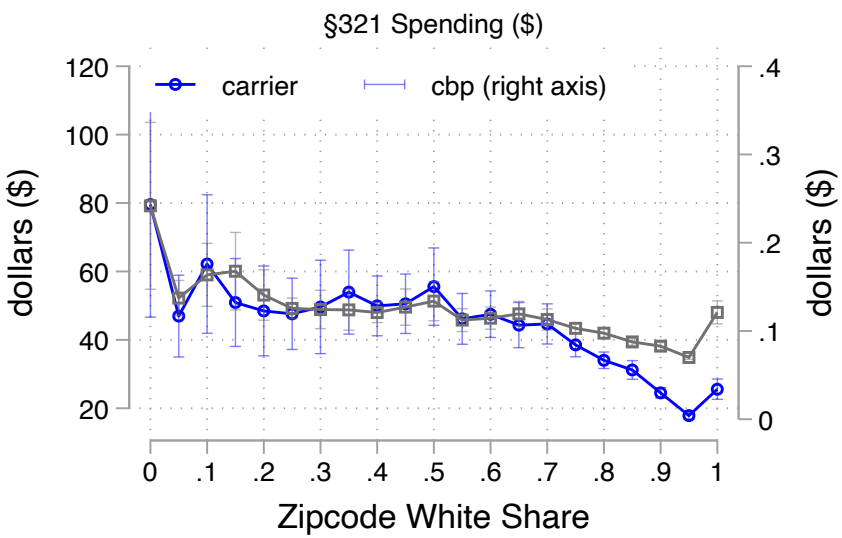
§321 Spending and Demographics

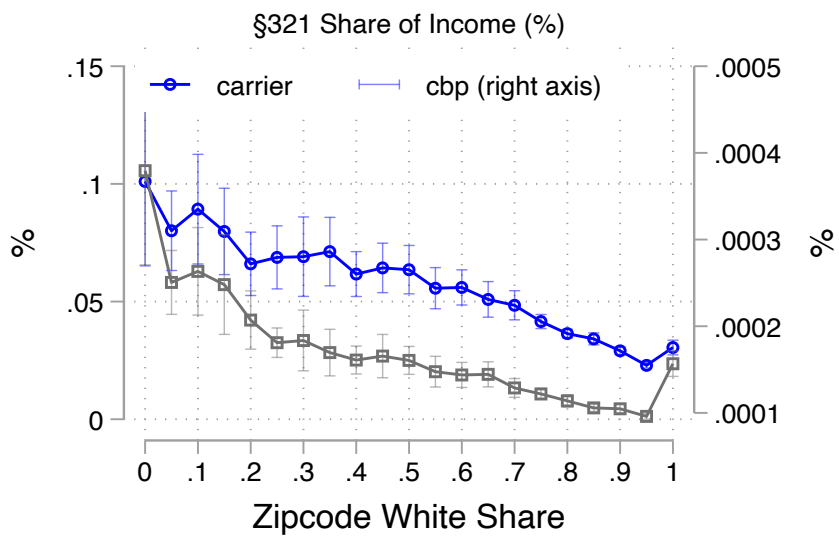
- From 2021 official CBP statistics, §321 spending pc was $131
- in carrier data, average zipcode §321 spending pc is $32.6
  - ratio of zipcode at the 90th vs 10th percentile of §321 spending pc is 10.0
- zipcodes' §321 per capita spending share:
  - of zipcode median household income: avg 0.04% (90-10 ratio: 7.4)
  - of zipcode apparel/electronic spending: avg 3.6% (90-10 ratio: 9.6)

§321 Spending and Demographics



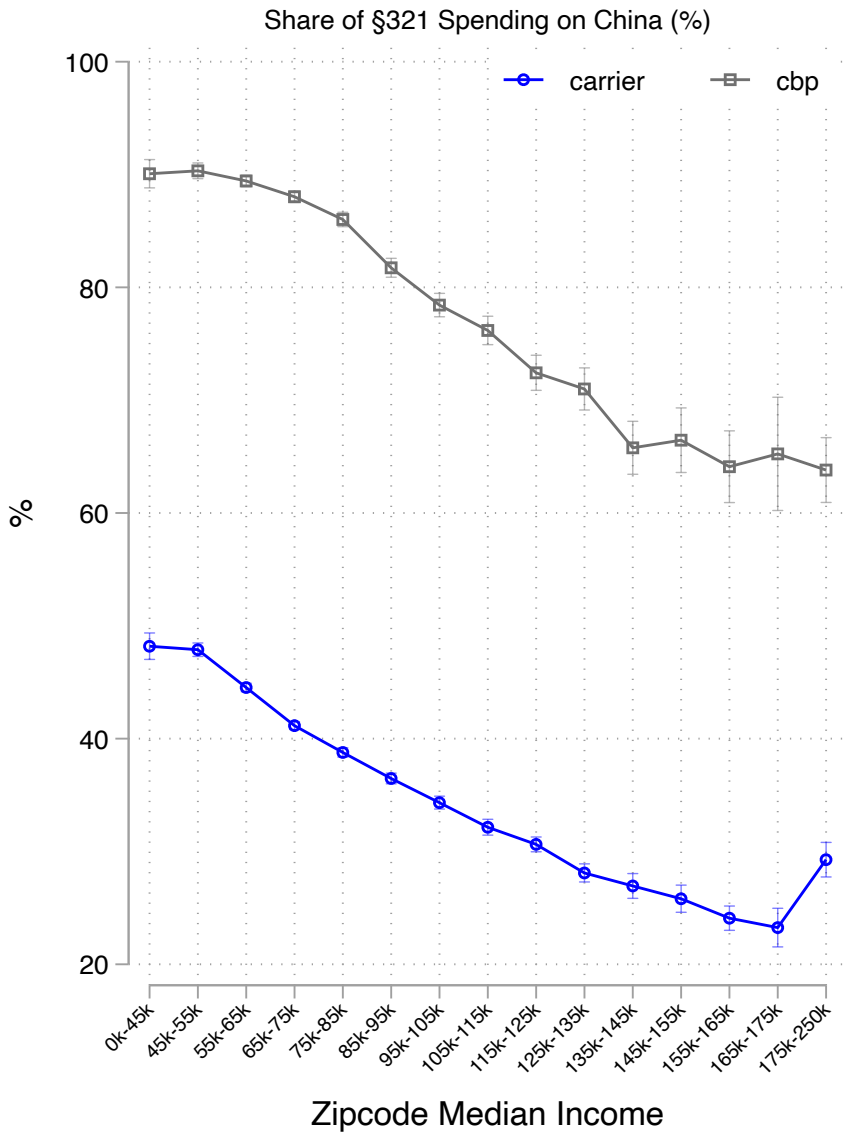


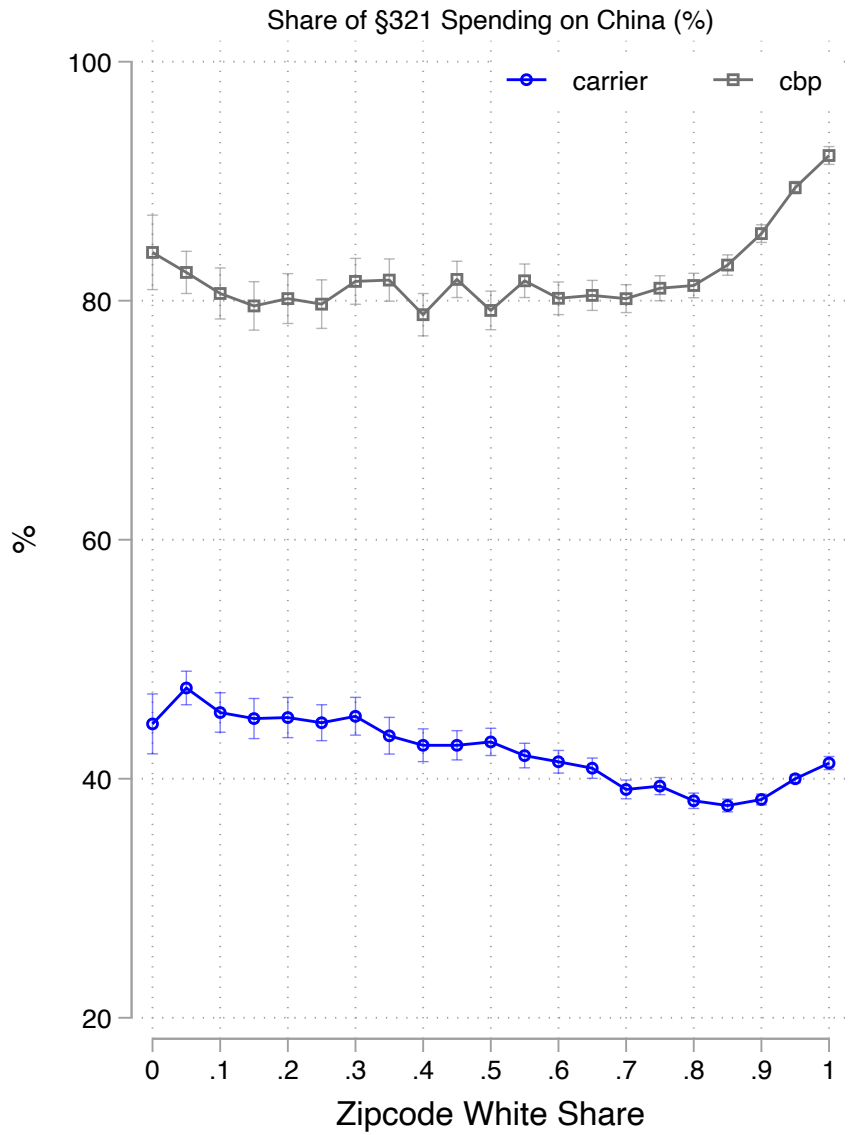




Notes: Top panel: left column plots §321 per-capita expenditures in 2021 from carrier data (blue), right column scales §321 per-capita expenditure by zipcode median household income. Bottom panel: plots series against zipcodes' share of non-hispanic white households. Grey denotes the correlations using the 1w CBP sample. 5/95% error bands reported.

§321 China Shares in DM Spending





Notes: both columns plots §321 share of expenditures on imports from China for 2021. 5/95% error bands reported.

Road Map

- §321 Policy, Data and Descriptive Statistics
- Framework
- Moments and Estimation
- Policy Experiment

Heterogeneous Consumers

- Heterogeneous consumer groups ω with preferences over packages
  - preferences on direct shipments x^ω:

$$u^\omega = A^\omega \left(x^\omega\right)^{\frac{\kappa}{1+\kappa}} - P^\omega x^\omega + y^\omega$$

  - CES (γ) across origins:

$$x^\omega = \left(\sum_o \left(a^\omega\right)^{\frac{1}{\gamma}} \left(x_o^\omega\right)^{\frac{\gamma-1}{\gamma}}\right)^{\frac{\gamma}{\gamma-1}}$$

  - CES (σ_o) across varieties from o:

$$x_o^\omega = \left(\int_{i\in\Omega_o} \left(a_i^\omega\right)^{\frac{1}{\sigma_o}} \left(n_i^\omega\right)^{\frac{\sigma_o-1}{\sigma_o}} di\right)^{\frac{\sigma_o}{\sigma_o-1}}$$

    - ★ n_i^ω: # packages of product i purchased by consumers in group ω

- Heterogeneity in $\{A^\omega, a^\omega, a_i^\omega\}$ across groups $\omega \rightarrow$ heterogeneous welfare impacts

Firms

- From each o, firms are heterogeneous:
  - in unit cost z_i
  - group-specific demand shock $\{a_i^\omega\}$
- "Sophisticated" (S) firms solve:

$$\max_v \left[\left(1 - 1_{v \geq v_{DM}} \tau_o\right) v - \left(z_i + 1_{v \geq v_{DM}} T\right)\right] D_i^\omega v^{-\sigma_o}$$

  - D_i^ω are demand shifters
    - ★ function of price indexes, spending, and size of consumer groups
  - leads to bunching (next slide)
- "Naive" (N) firms do not bunch
  - uses high-tariff pricing when low-tariff pricing puts it above v_{DM}
  - deals with apparent lack of hole above the notch in the data (see below)

Pricing

- Choice by "sophisticated" firms to send through §321 or not:
  - §321 shipments
    - ★ (below-threshold prices, no tariffs)→ chosen by low unit cost firms
    - ★ (price at threshold, no tariffs)→ chosen by intermediate cost (bunchers)
  - non-§321 shipments
    - ★ (high prices and high tariffs) –> chosen by high unit cost firms

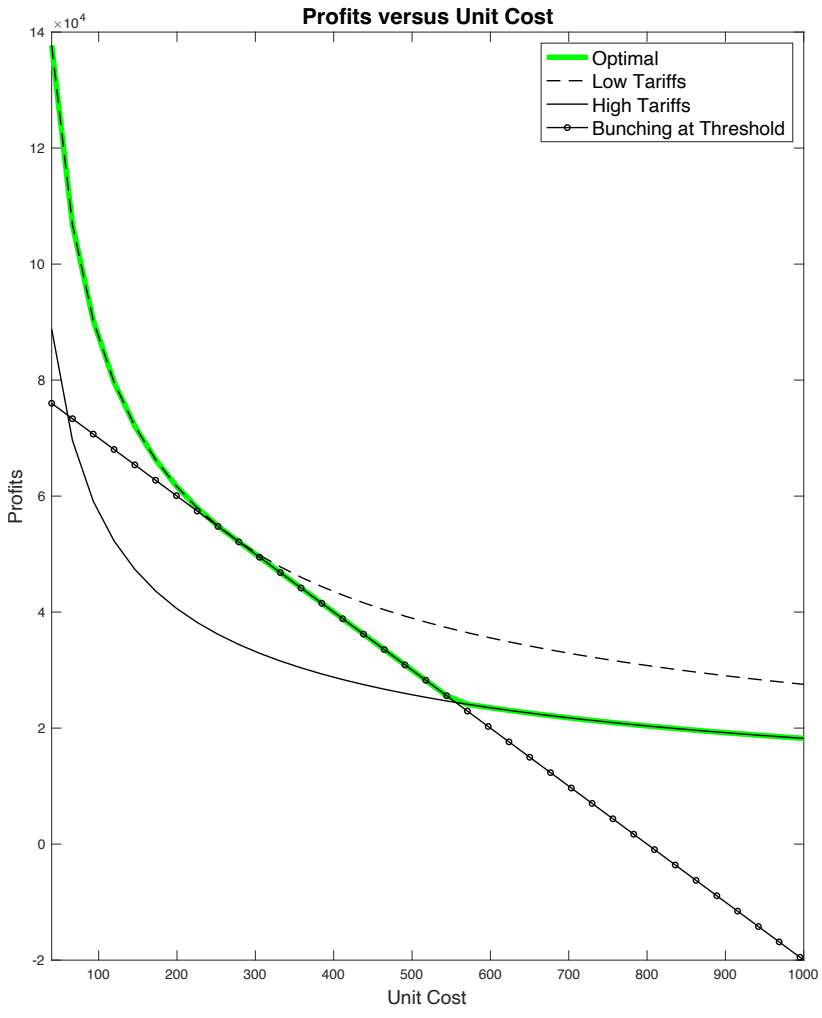
- Formally, optimal pricing is:

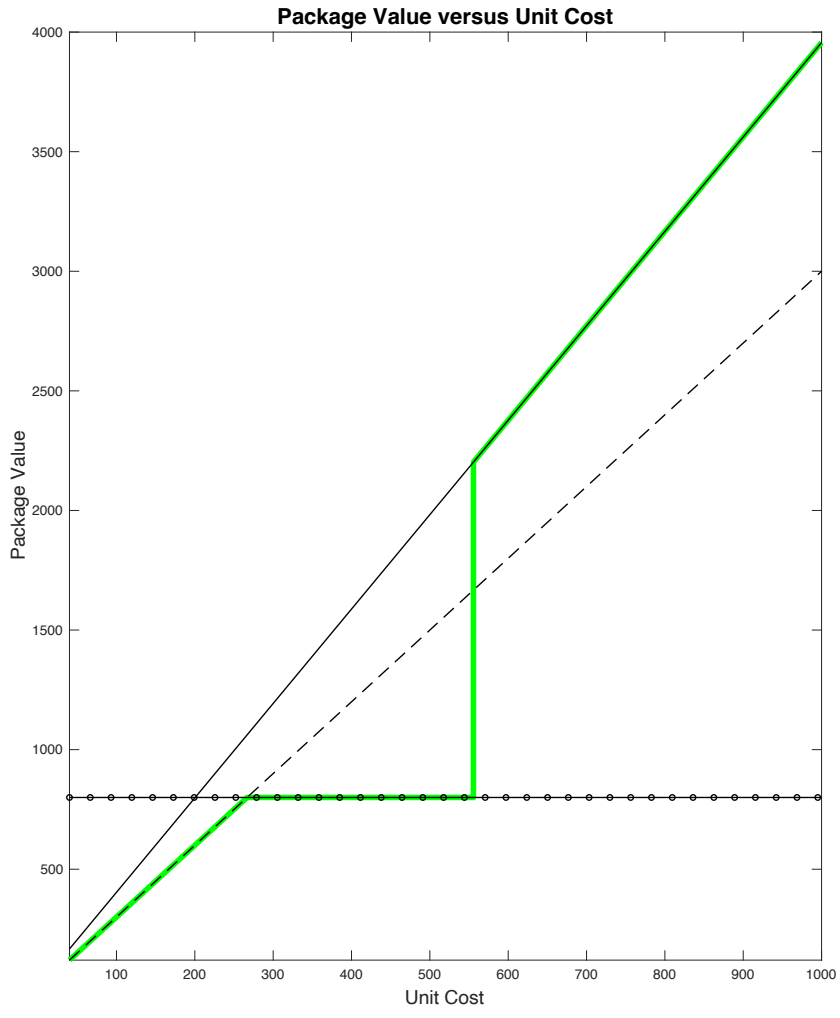
$$v_{o,s}(z) = \begin{cases} \frac{\sigma_o}{\sigma_o - 1} z & z < \underline{z}_o \\ v_{DM} & \underline{z}_o \leq z < \bar{z}_o \\ \frac{\sigma_o}{\sigma_o - 1} \frac{z + T}{1 - \tau_o} & \bar{z}_o \leq z \end{cases}$$

  - $\underline{z}_o$ (lowest cost buncher) such that $\frac{\sigma_o}{\sigma_o - 1} \underline{z}_o = v_{DM}$
  - pricing jumps discretely at $\bar{z}_o$ (highest cost buncher)
  - implies a "hole" in distribution of values on $\left[v_{DM}, \frac{\sigma_o}{\sigma_o - 1} \frac{\bar{z}_o + T}{1 - \tau_o} \right]$

- NB: pricing/selection into §321 independent from demand shifters (due to CES)

Formal versus Informal Tradeoff





Measurement of Consumer Impacts

Suppose tariffs or DM threshold change:

- **Cost increase** over all direct shipments from origin o for group ω:

$$\hat{P}_o^\omega = \left(\sum_{j=S,N} \int_z \lambda_{o,j}^\omega (z) \hat{v}_{o,j} (z)^{1-\sigma_o} \, dz \right)^{\frac{1}{1-\sigma_o}}$$

  - $\hat{v}_{o,j}(z)$ is the price increase of firms with unit cost z
  - $\lambda_{o,j}^\omega(z)$ is the group-ω (pre-shock) import share in those firms
    - ★ depends on joint density over (z, a_o^ω)

- **Cost increase** of basket of direct shipments for group ω:

$$\hat{P}^\omega = \left(\sum_o \lambda_o^\omega \left(\hat{P}_o^\omega \right)^{1-\gamma} \right)^{\frac{1}{1-\gamma}}$$

  - λ_o^ω is (pre-shock) import share from o (among consumers ω)

- **Welfare impact** in USD per consumer of group ω:

$$\Delta u^\omega = \frac{\left(\hat{P}^\omega \right)^{-\kappa} - 1}{\kappa} e^\omega + \Delta tr^\omega$$

  - e^ω is pre-shock expenditures in all direct shipments
  - Δtr^ω is tariff revenue allocated to the group

Parametrization Strategy

- Iterative procedure over $\left\{\sigma_o, \lambda^{\omega}_{o,j}(z)\right\}$
  1. Given σ_o, recover $\lambda^{\omega}_{o,S}(z)$ and $\lambda^{\omega}_{o,N}(z)$ from observed densities by consumer group in post-2016 period
     - ★ match fraction of "naive" firms to observed density of shipments within model-implied hole
  2. Simulate shocks back to pre-period
     - ★ change de minimis threshold from \$800 to \$200
     - ★ change high trade-war tariffs to pre-period (low) tariffs
  3. Calibrate σ_o to match observed relative change in package density between \$200 and \$800 due to bunching
- γ and κ reflected in associated changes in import shares
  - for now, calibrated to Fagelbaum et al (2020)
  - future versions: tariffs across origins can recover γ, and direct shipments over imports recover κ

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Impacts of §321 thresholds

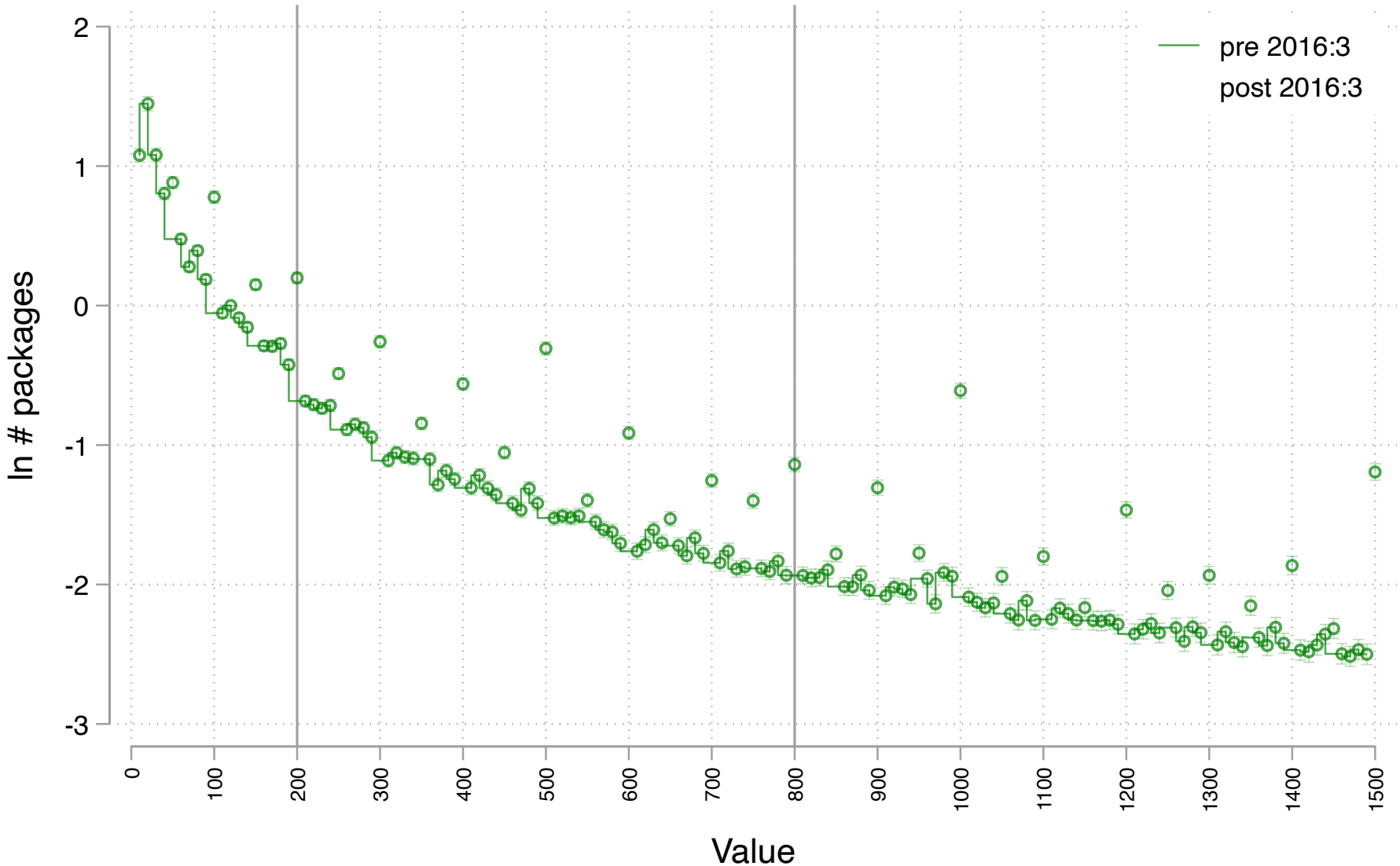
- Observe the density of §321 shipments relative to two controls
  - $\Longrightarrow$ changes in the density when the threshold changes from \$200 to \$800
  - pre vs post
  - shipments to US vs shipments to OECD
- In levels

$$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b + \epsilon_{bodxt}$$

  - b: \$10 bin
  - o: origin
  - d: destination (US vs OECD)
  - x: carrier (A,B,C)
  - t: month
  - fixed effects: α_{xt} and α_o
  - leave-out bin: \$120
- plot the bin FEs β_b to show the density of shipments

USA Shipment Density: Pre-Period

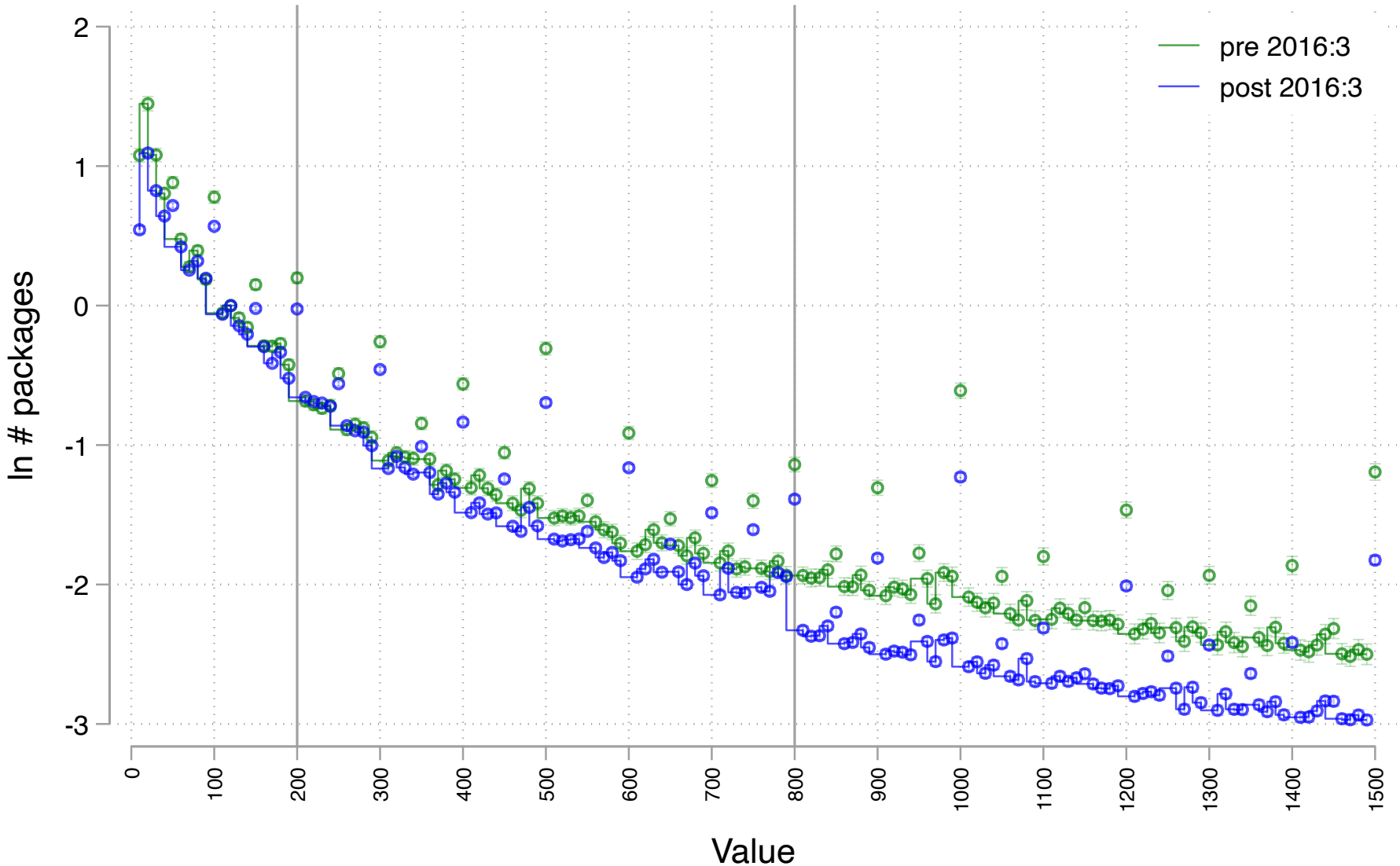
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b + \epsilon_{bodxt}$ if USA==1 & post==0



normalized to # packages at $120

USA Shipment Density: Post Period

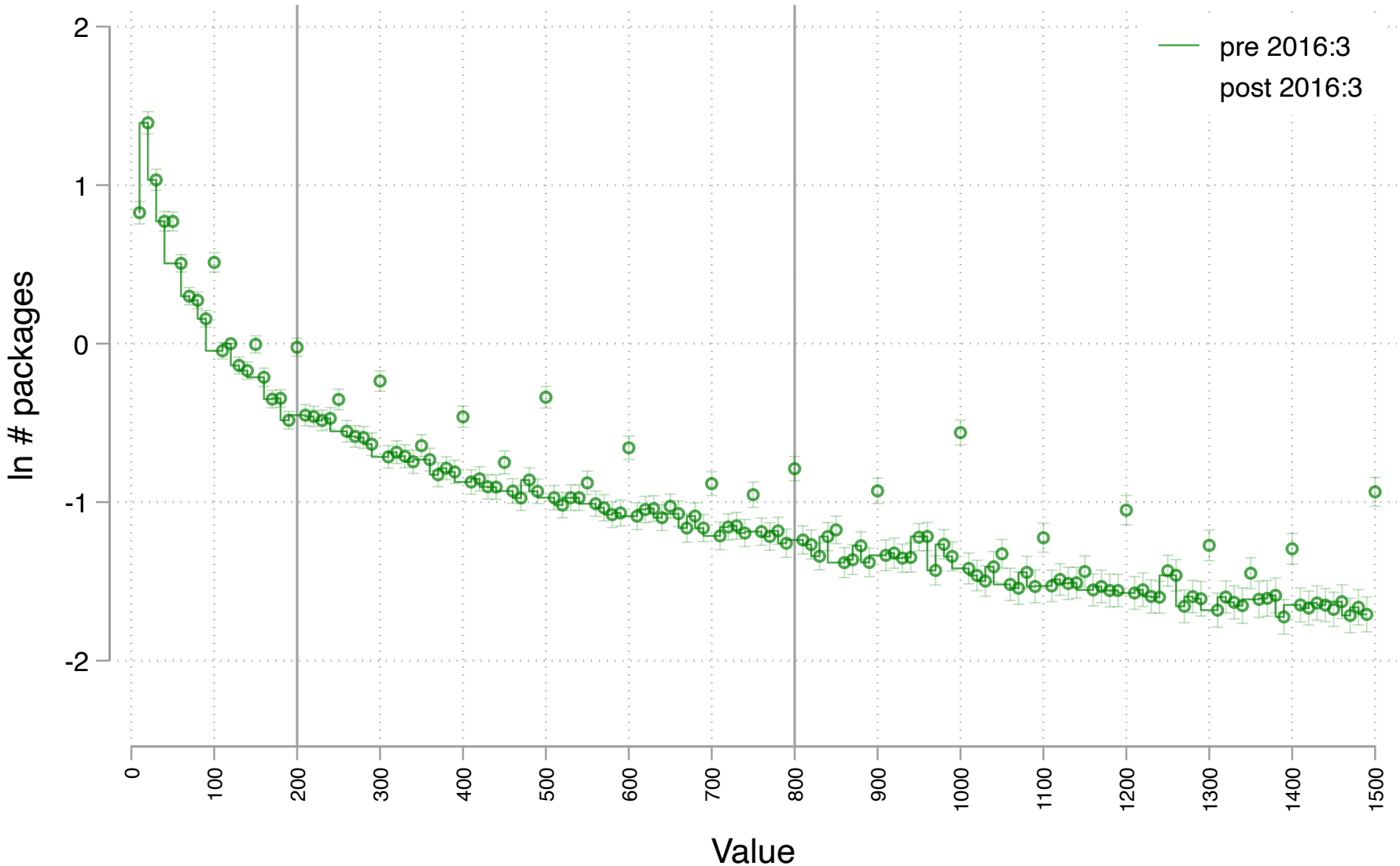
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b + \epsilon_{bodxt}$ if USA==1 & post==1



normalized to # packages at $120

OECD Shipment Density: Pre Period

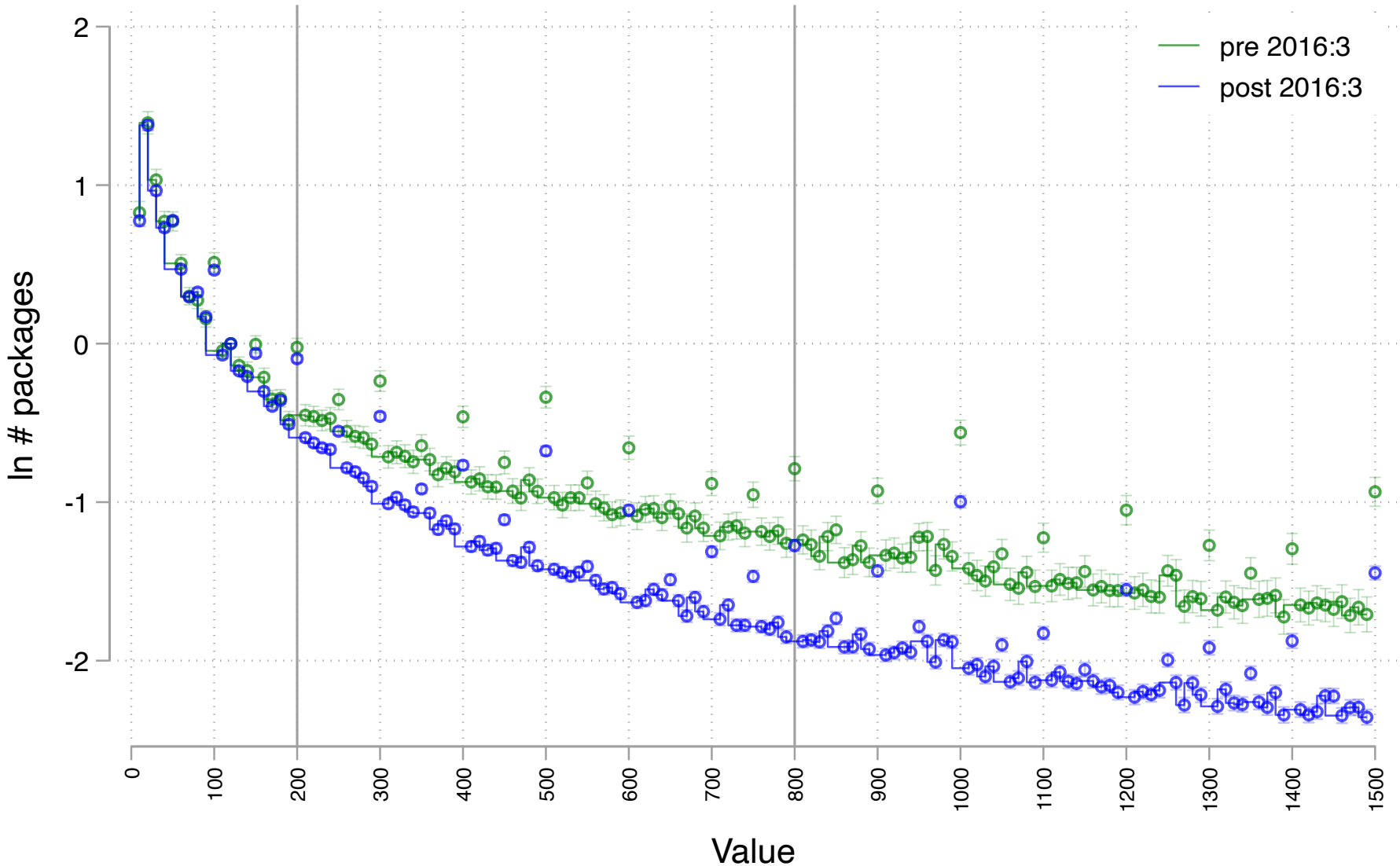
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b + \epsilon_{bodxt}$ if USA==0 & post==0



normalized to # packages at $120

OECD Shipment Density: Post Period

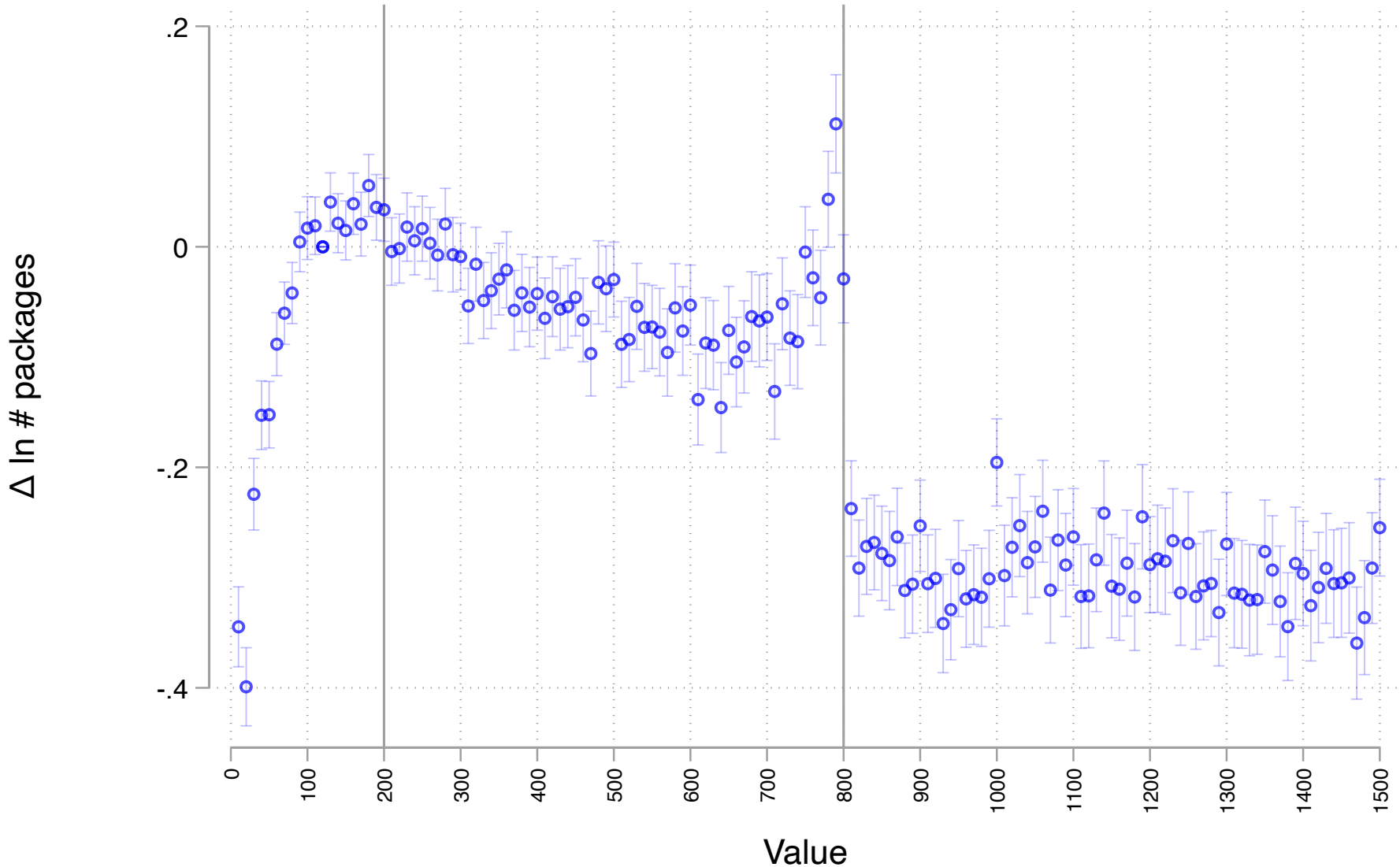
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b + \epsilon_{bodxt}$ if USA==0 & post==1



normalized to # packages at $120

Δ Density: USA vs OECD in Post

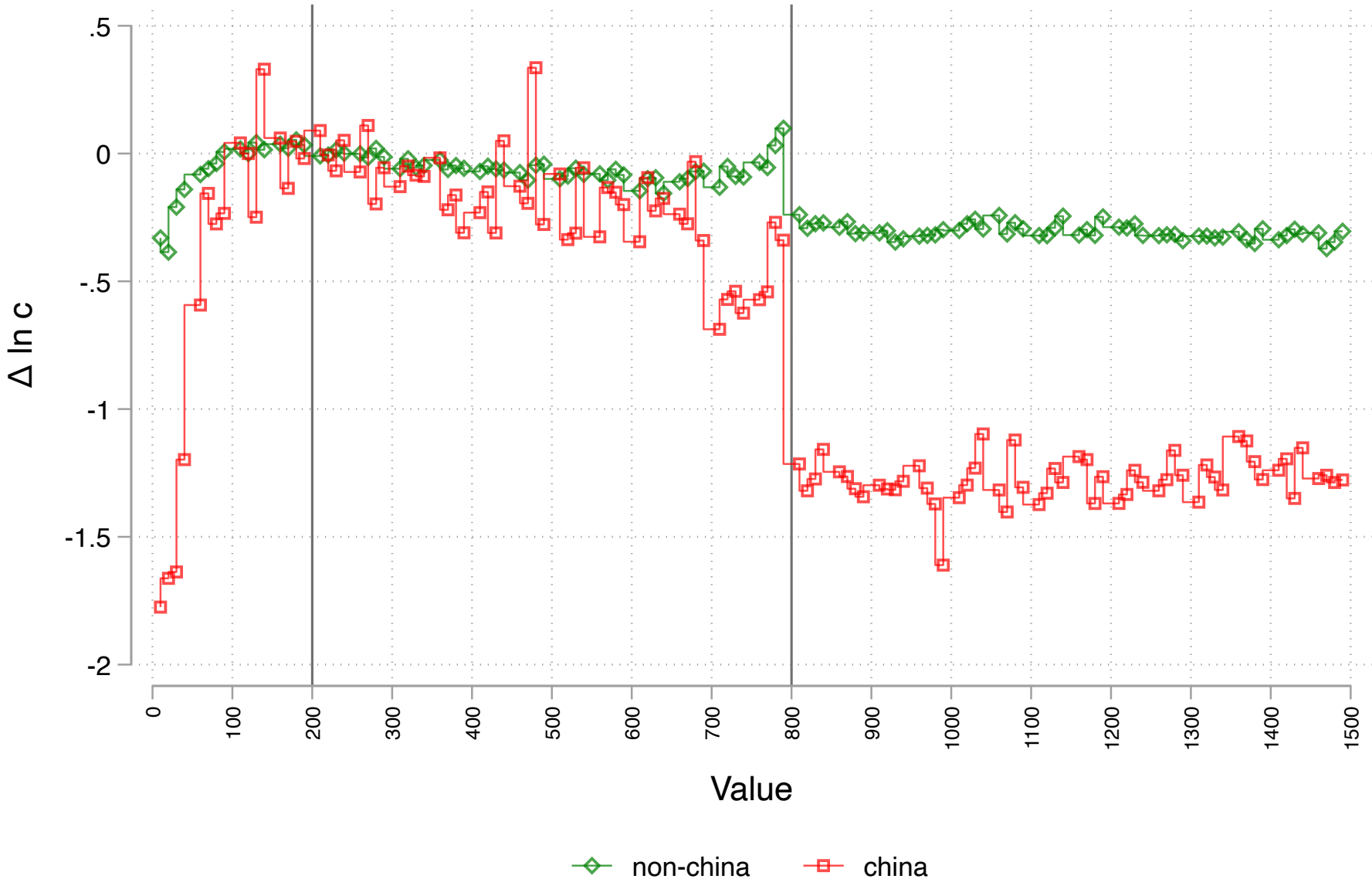
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b \times USA_d + \epsilon_{bodxt}$ if post==1



normalized to Δ # packages at $120

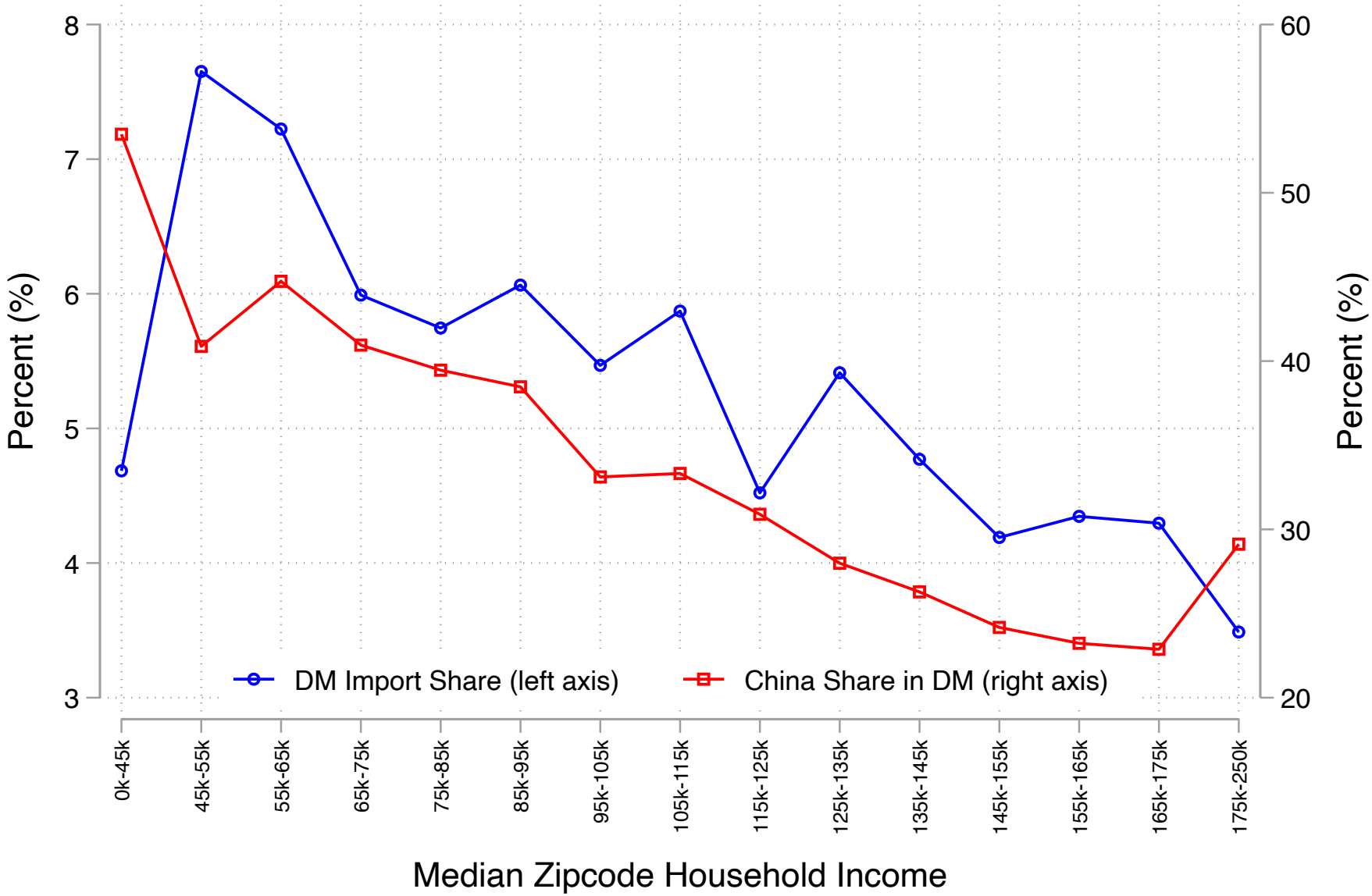
Δ Density: USA vs OECD in Post, By Origin

$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b \times USA_d + \epsilon_{bodxt}$ if post==1



DM Share of Shipments, and China Share of DM

Zipcodes' §321 expenditures divided by direct shipments & §321 import share from China



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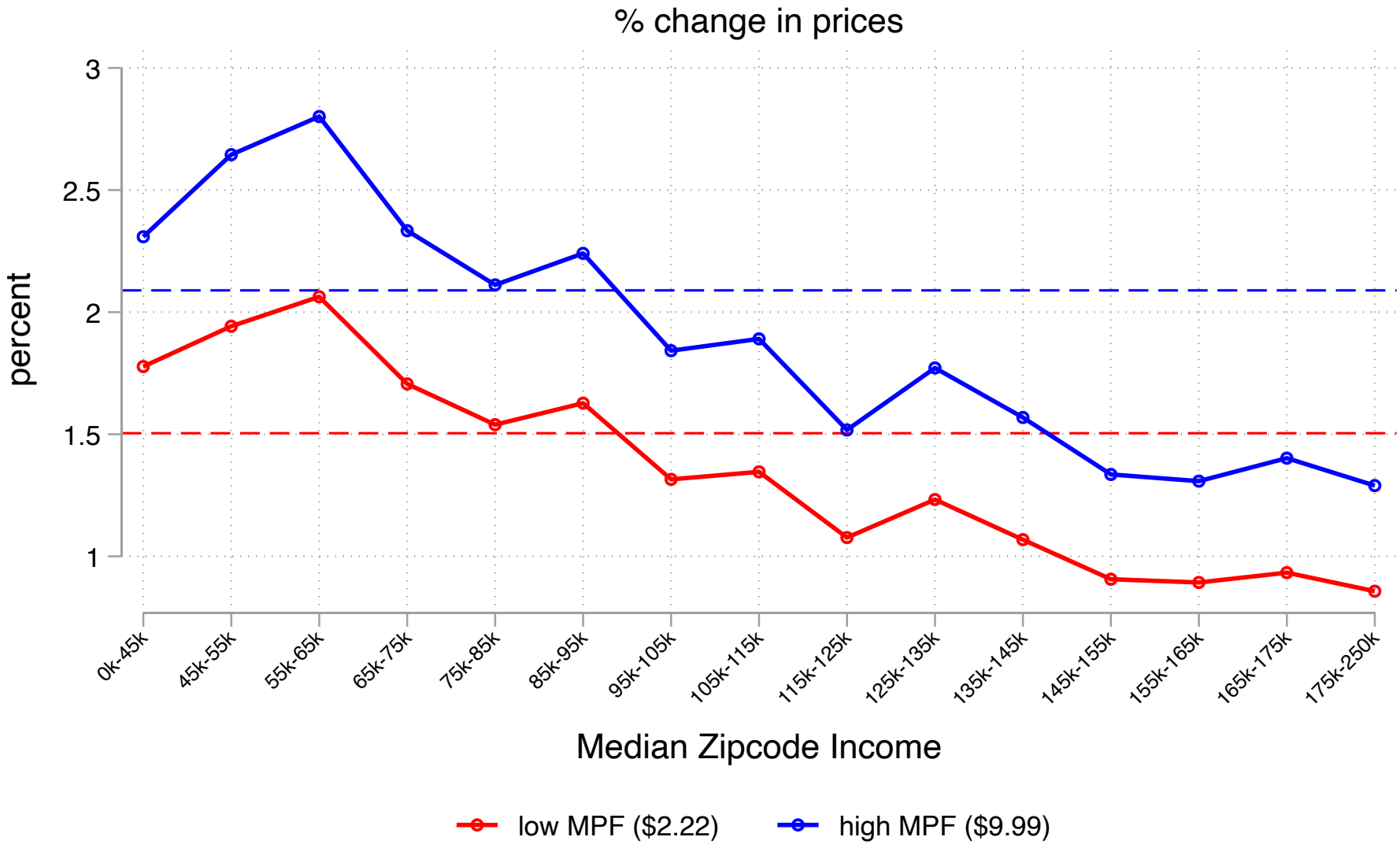
Policy Experiment

- Eliminate §321 from current equilibrium, so shipments below $800:
  - subject to tariffs
  - subject to per-shipment "merchandise processing fee" of $2.22 or $9.99 (current fee for informal shipments, $801-$2500)
- Two origins: China and non-China
  - processing fee paid on imports from both origins
  - tariffs on China imports: 24.0%
  - tariffs on Non-China imports: 1.6%
- Procedure finds:
  - low fee case: σ_{chn} =4.30, $\sigma_{non-chn}$ =3.42
  - high fee case: σ_{chn} =4.22, $\sigma_{non-chn}$ =4.90
    - ★ set γ =2.53 Fajgelbaum et al. 2020
- Examine impacts across zipcode median income, % white household share

Price Index Increase from Removing §321

change in price index for basket of direct shipments

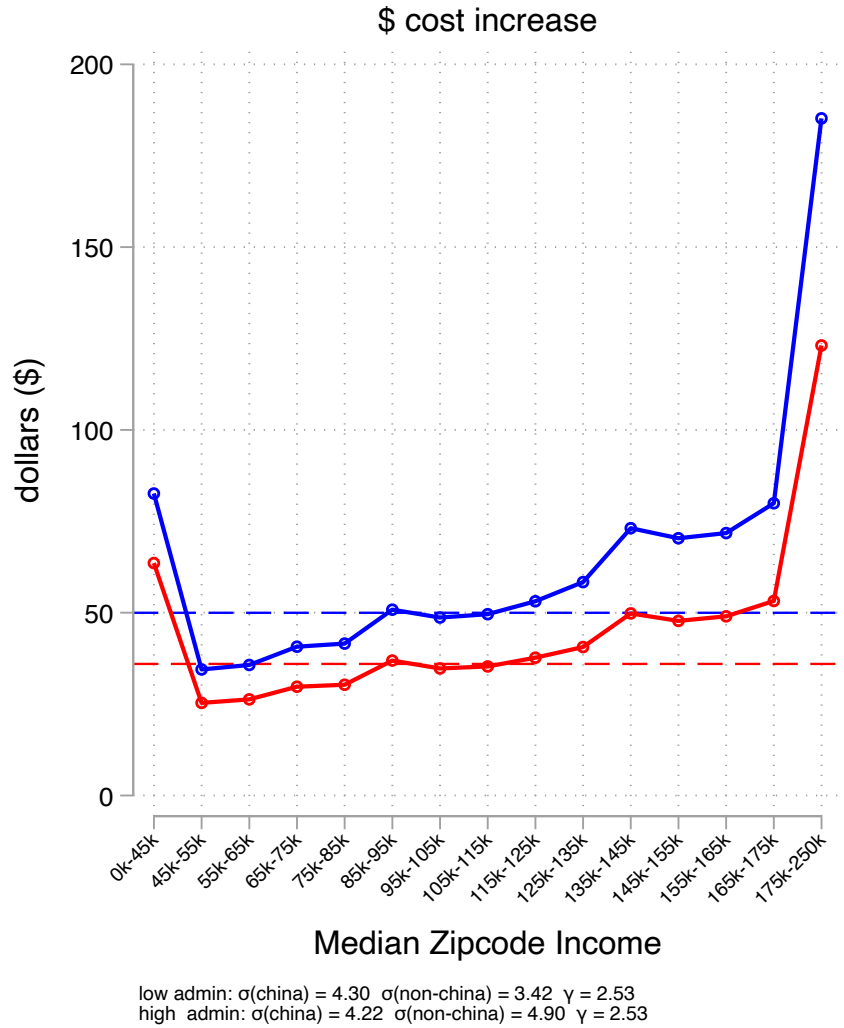


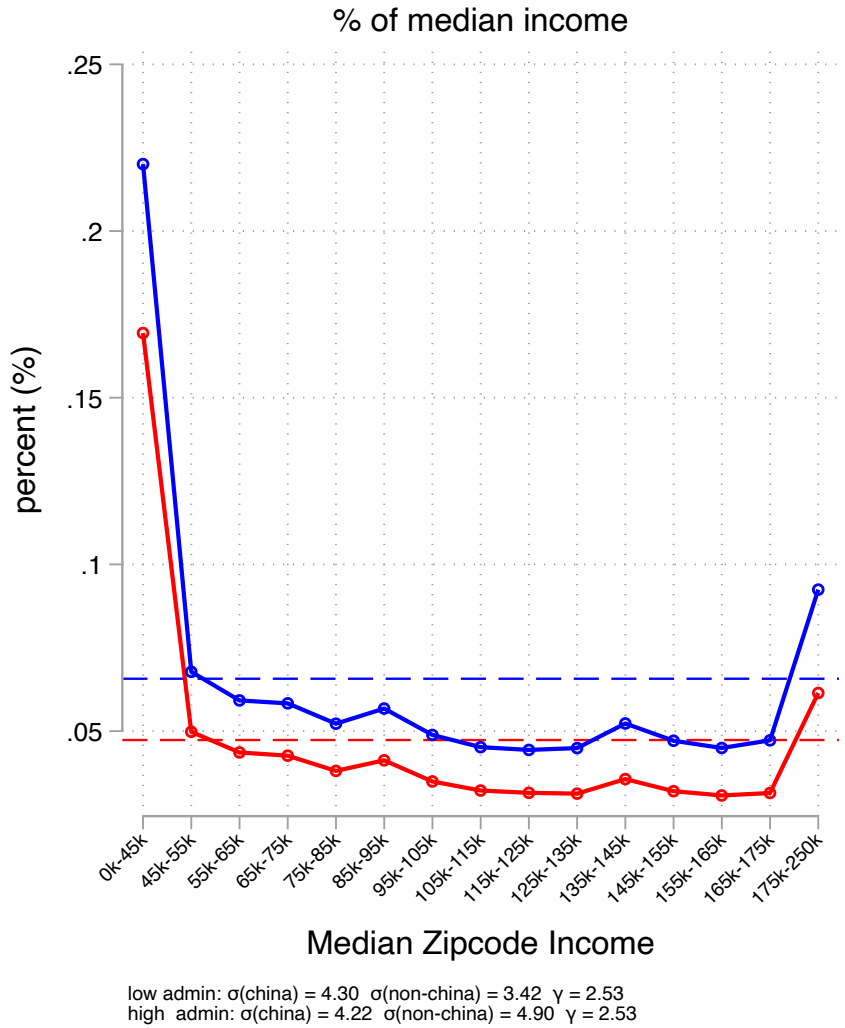
low admin: σ(china) = 4.30 σ(non-china) = 3.42 γ = 2.53
high admin: σ(china) = 4.22 σ(non-china) = 4.90 γ = 2.53

Horizontal dash lines denote price index change for the representative consumer. "MPF" is merchandise processing fee.

Dollar Cost Increase from Removing §321

increase in cost of direct shipments (change price index ×amount spent)





low MPF ($2.22) high MPF ($9.99)

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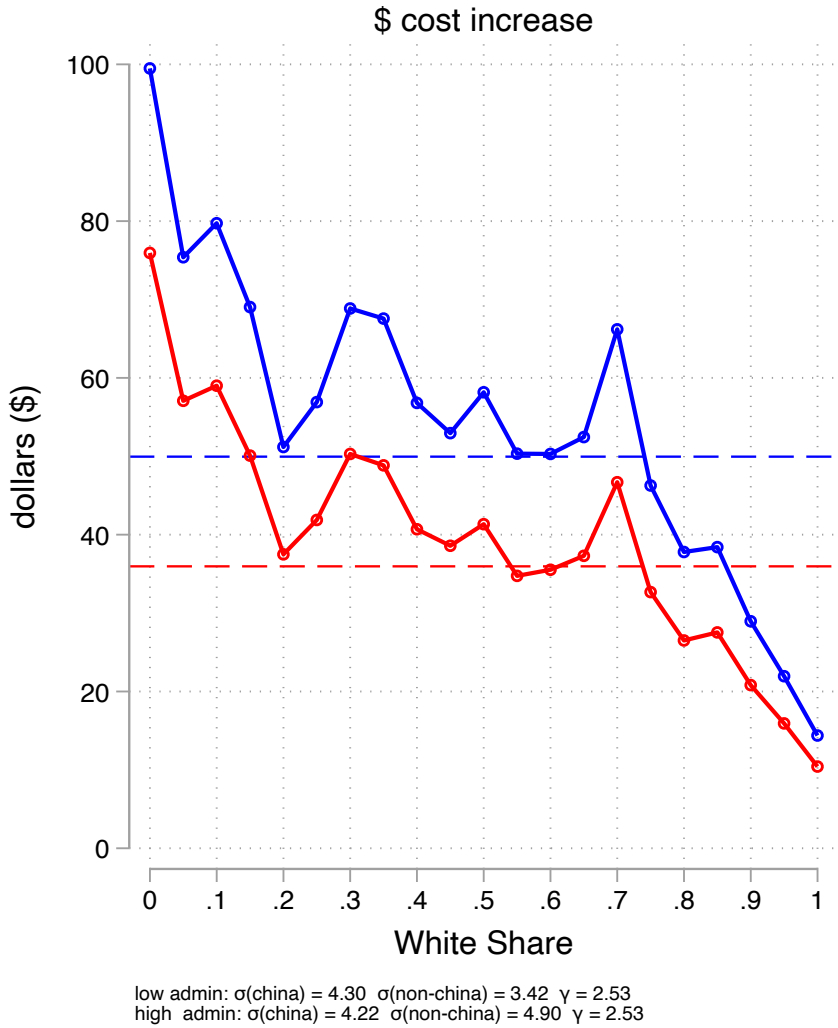
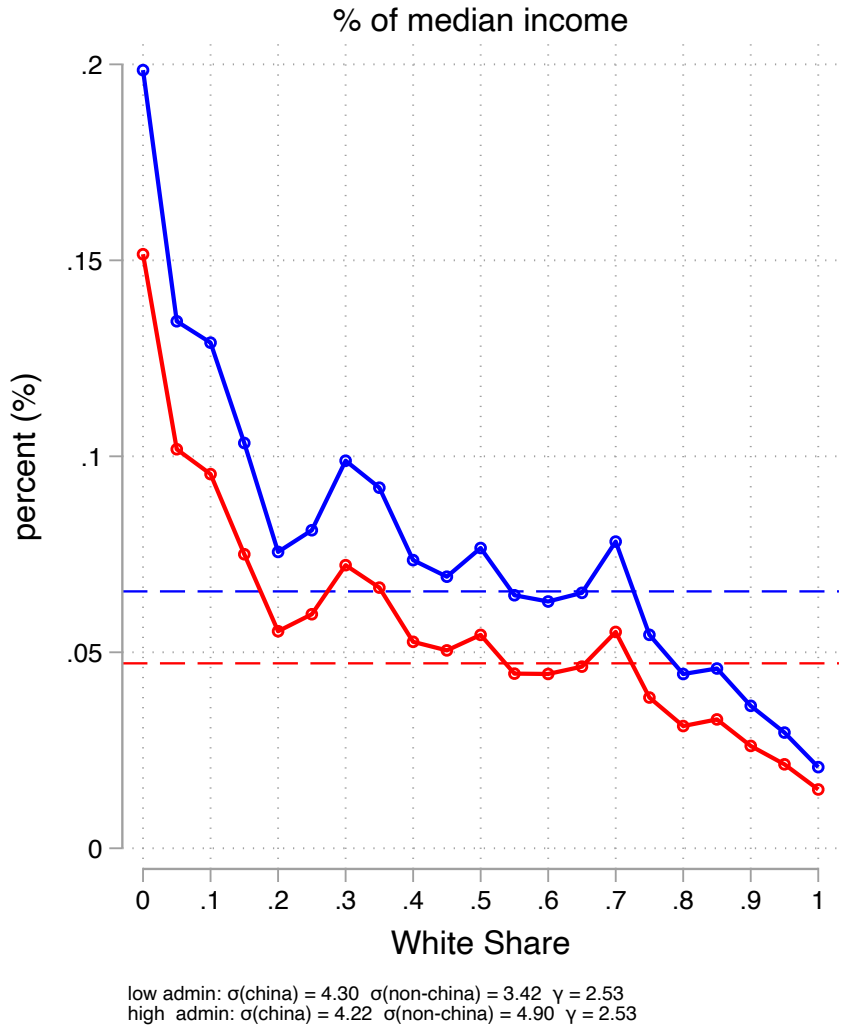
Dollar Cost Increase from Removing §321

increase in cost of direct shipments (change price index ×amount spent)



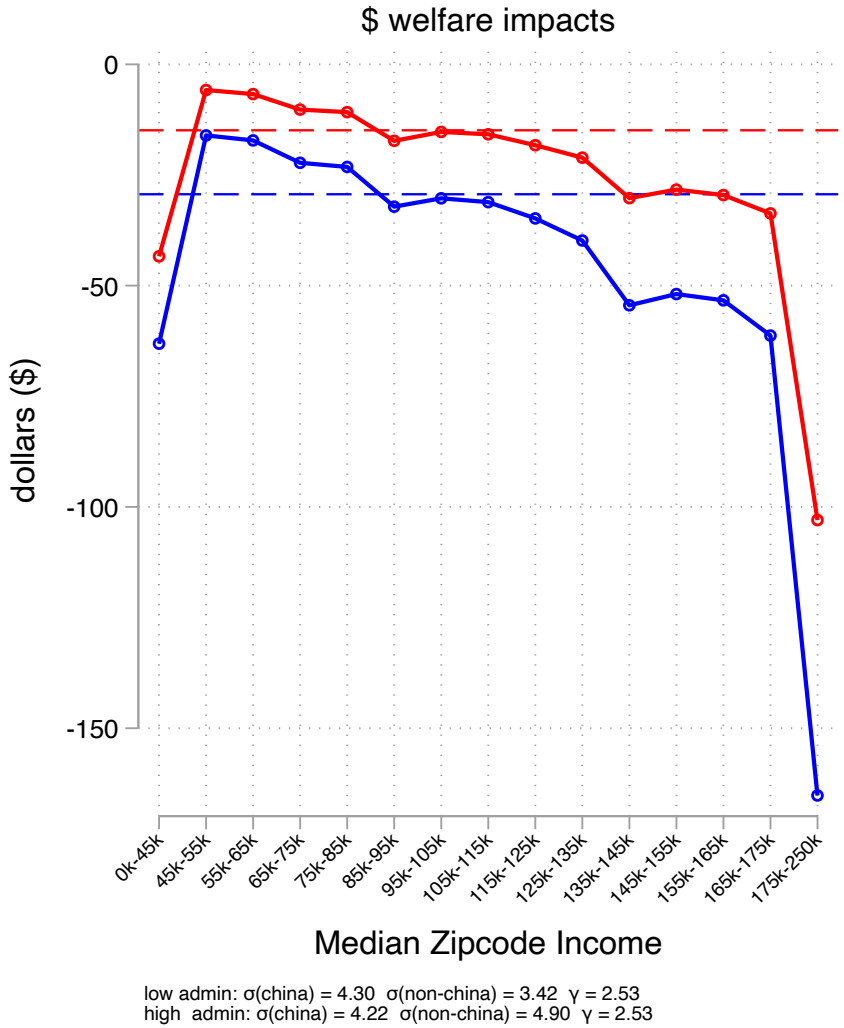


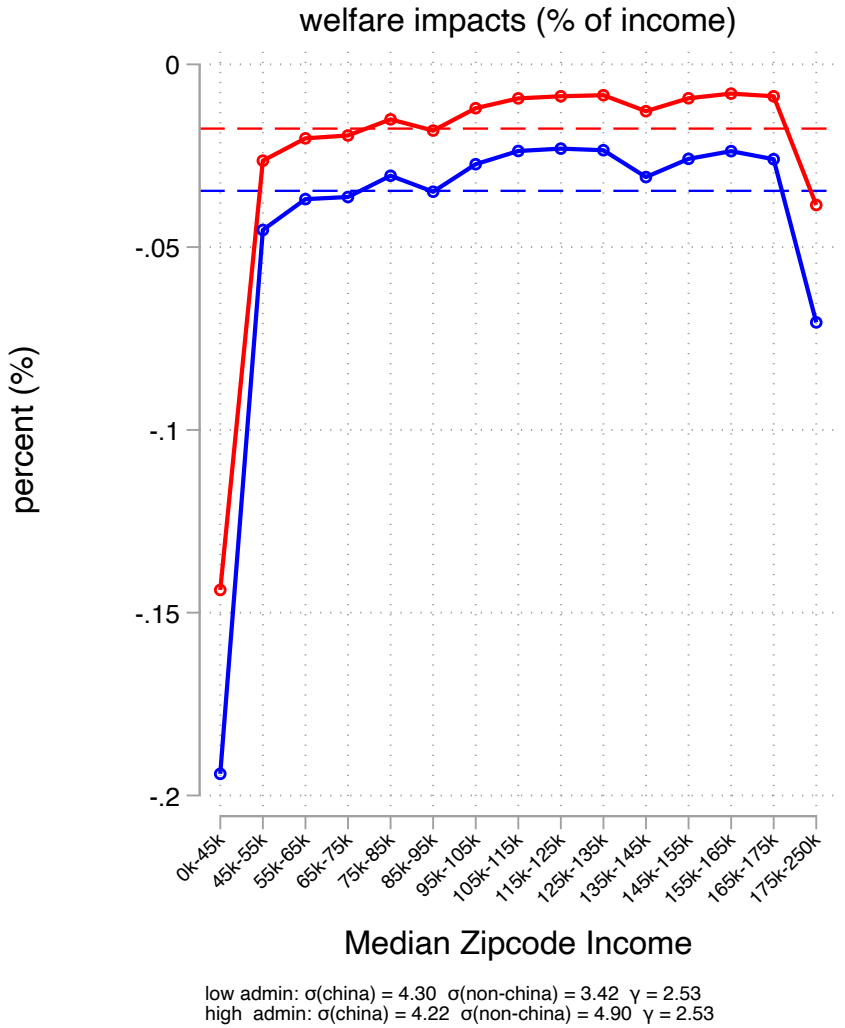
low MPF ($2.22) high MPF ($9.99)

Horizontal dash lines denote dollar cost changes for the representative consumer. "MPF" is merchandise processing fee.

Welfare Impacts from Removing §321

includes tariff revenues equally rebated to consumers



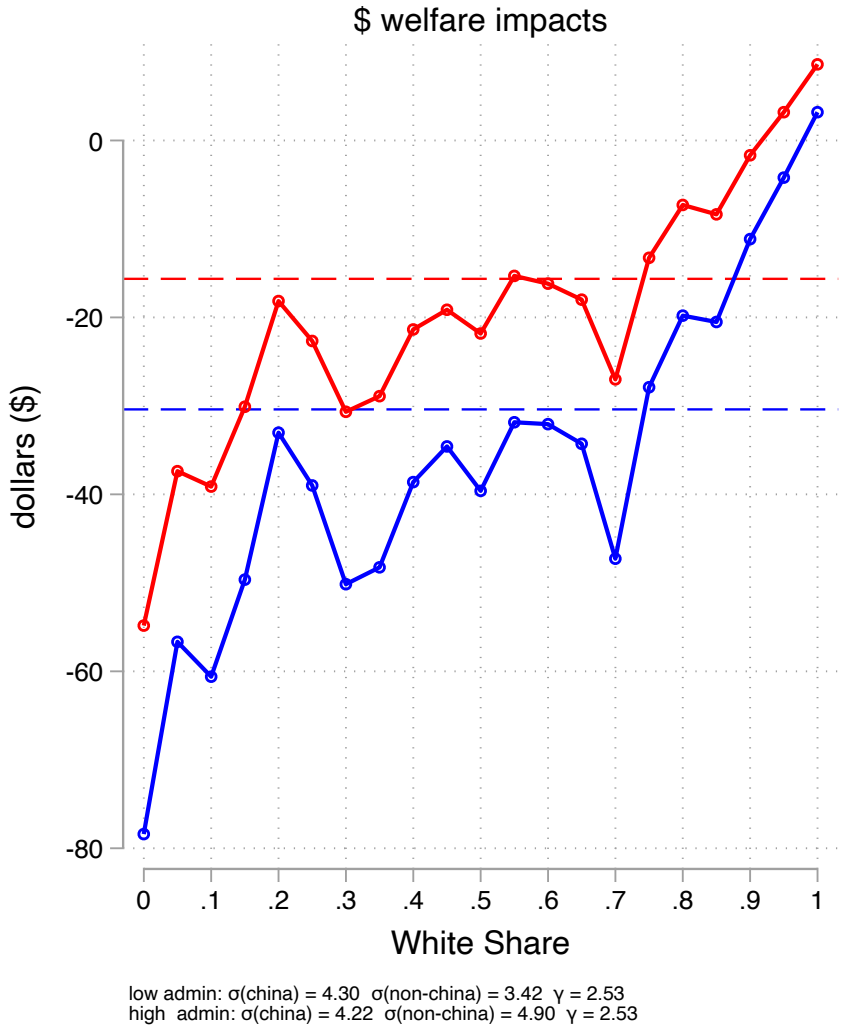


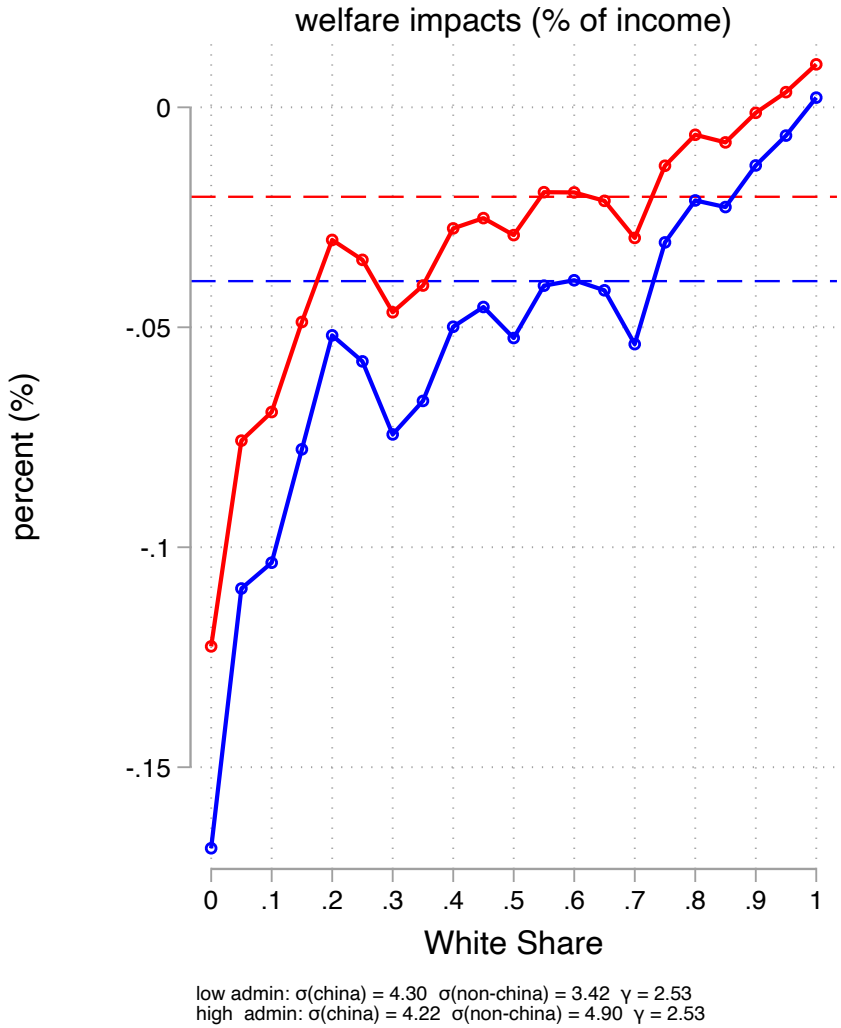
low MPF ($2.22) high MPF ($9.99)

Horizontal dash lines is the weflare impact for the representative consumer (negative value means a loss).

Welfare Impacts from Removing §321

includes tariff revenues equally rebated to consumers





low MPF ($2.22) high MPF ($9.99)

Horizontal dash lines is the weflare impact for the representative consumer (negative value means a loss).

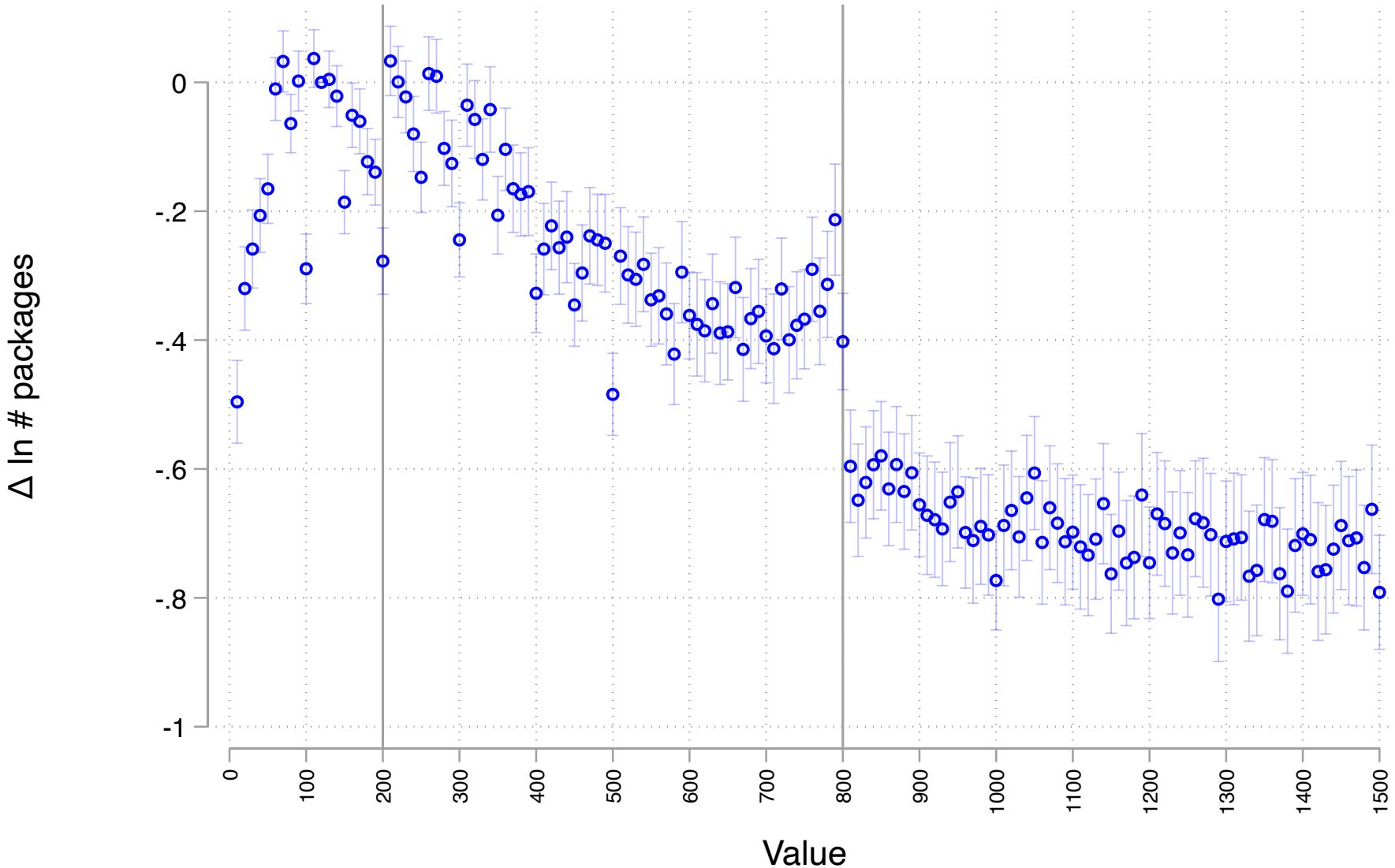
Preliminary Conclusions

- Eliminating §321 raises consumers' costs of buying a basket of direct shipments:
  - by \$36.0/yr from §321 in low fee case
  - by \$50.0/yr from §321 in high fee case
  - tariff revenue gain does not offset consumer loss
- Unequal impacts of §321:
  - zips at the lowest and highest median income gain more from §321 than middle-income zips
  - ...as do zips with higher shares of non-white households
- Future versions will examine distributional consequences §321 on additional zipcode demographics, and consider impacts on US producers

Appendix Slides

Δ Density: Post vs Pre (Households Points)

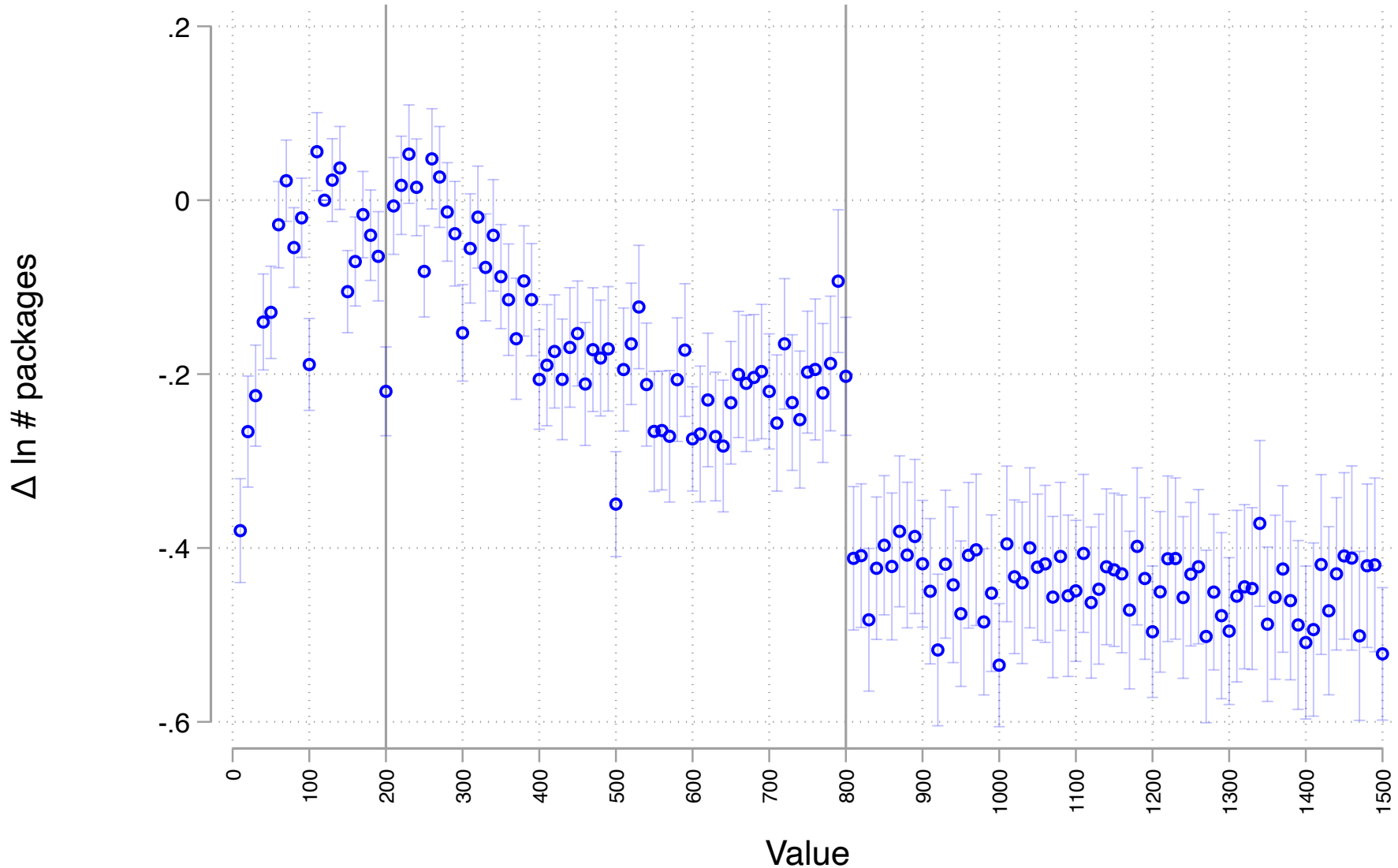
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b \times post_b + \epsilon_{bodxt}$ if USA==1 & household==1



normalized to Δ # packages at $120

Δ Density: Post vs Pre (Commercial Points)

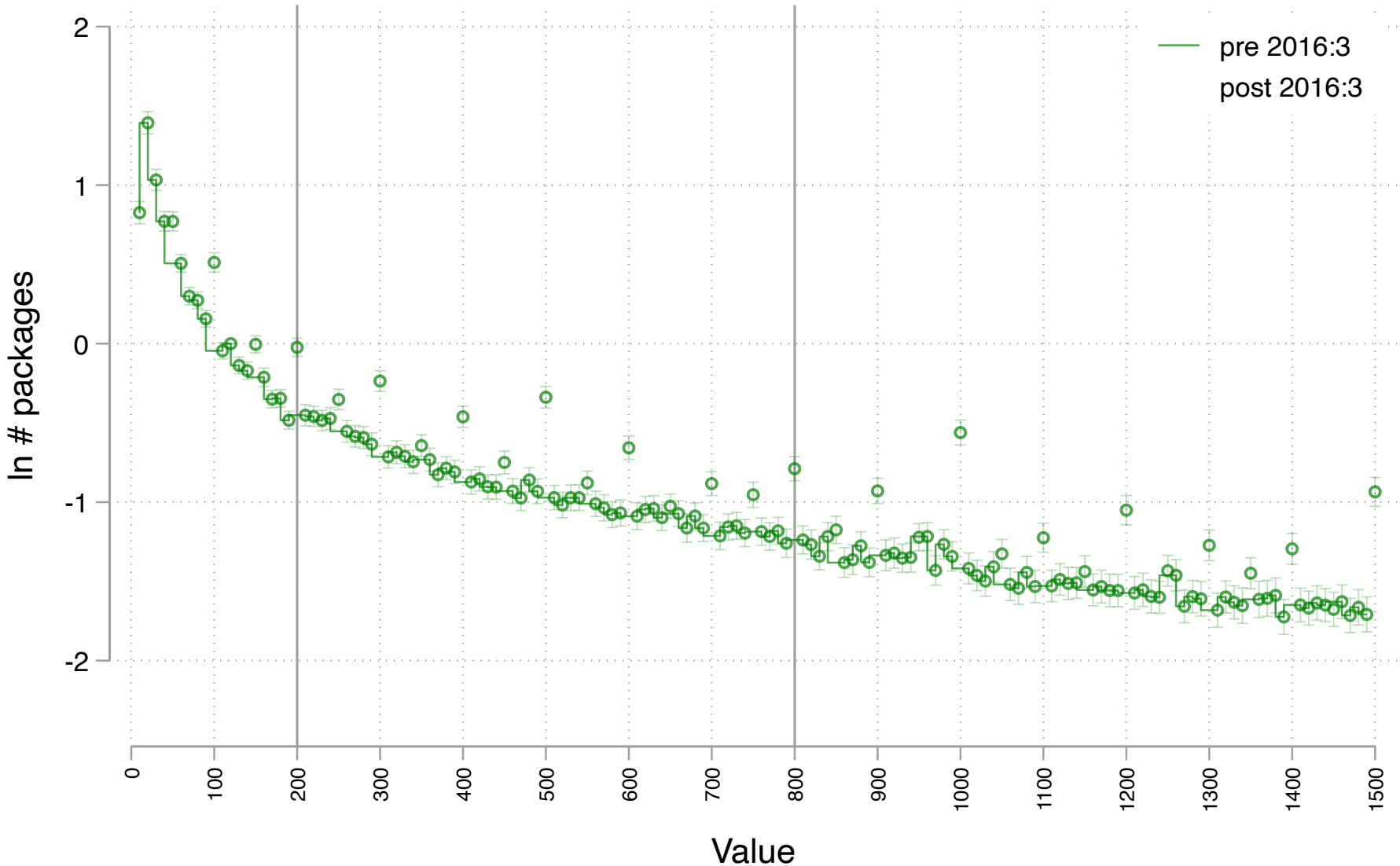
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b \times post_b + \epsilon_{bodxt}$ if USA==1 & commercial==1



normalized to Δ # packages at $120

OECD Shipment Density: Before March 2016

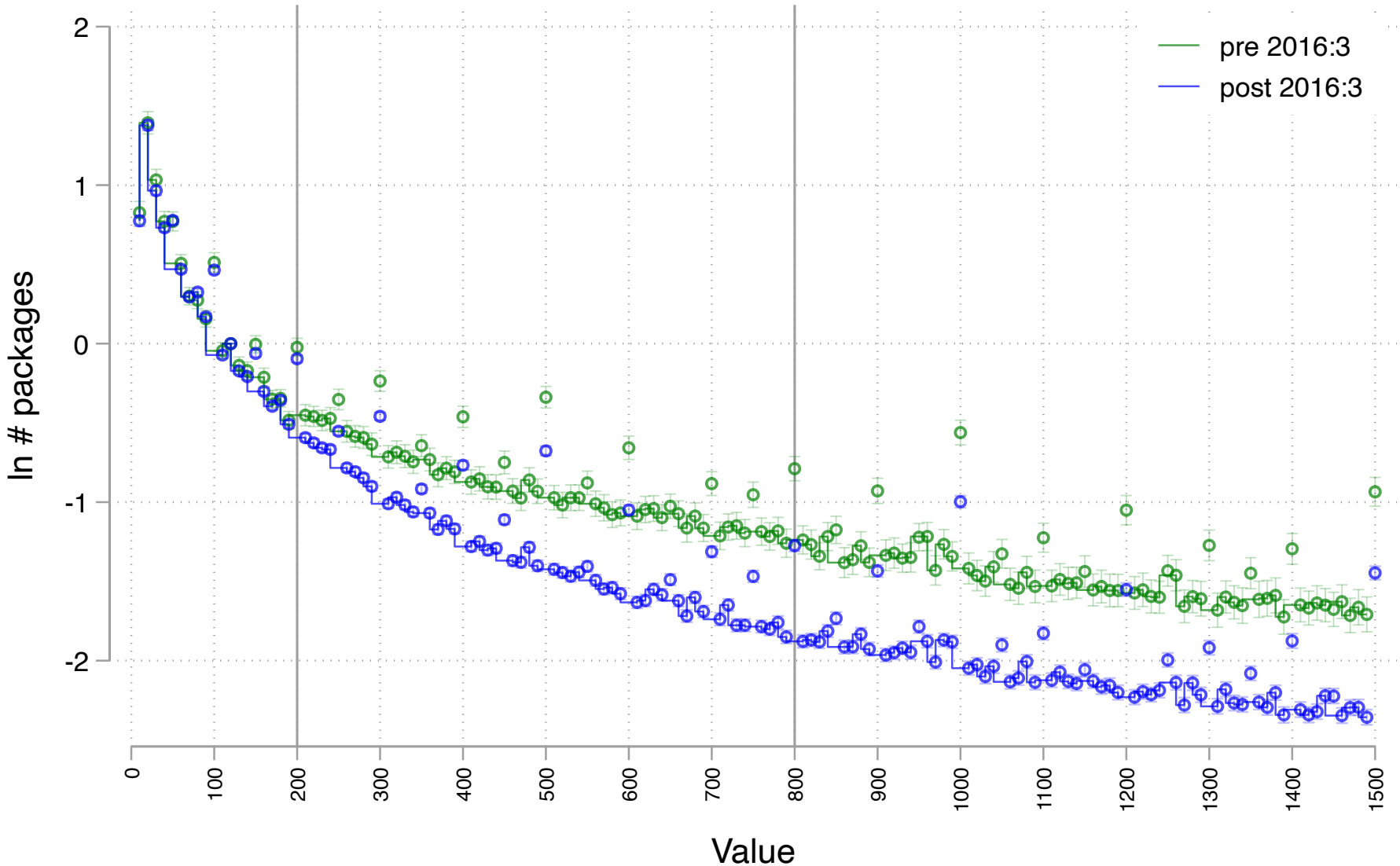
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b + \epsilon_{bodxt}$ if USA==0 & post==0



normalized to # packages at $120

OECD Shipment Density: After March 2016

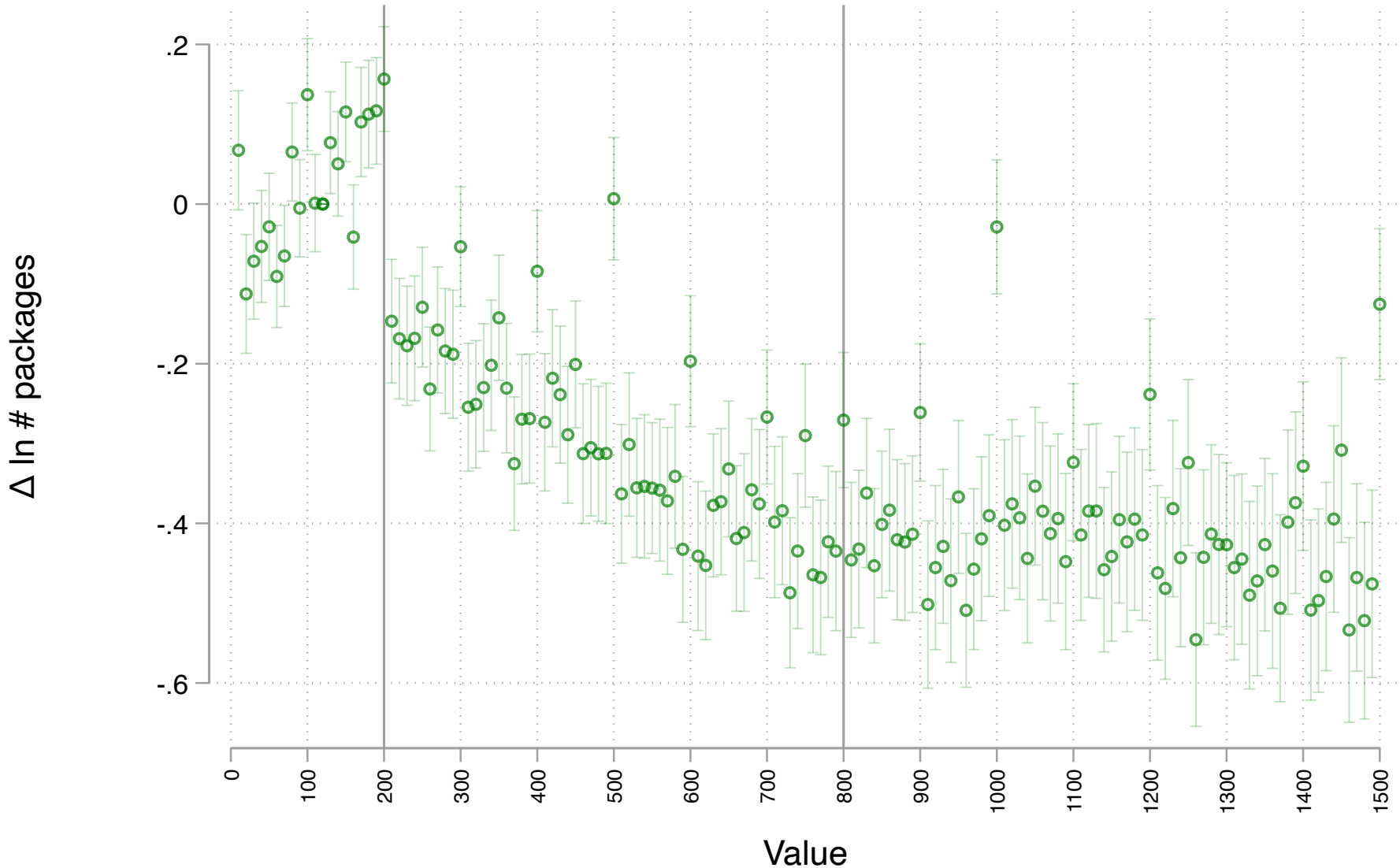
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b + \epsilon_{bodxt}$ if USA==0 & post==1



normalized to # packages at $120

Δ Density: USA vs OECD in Pre

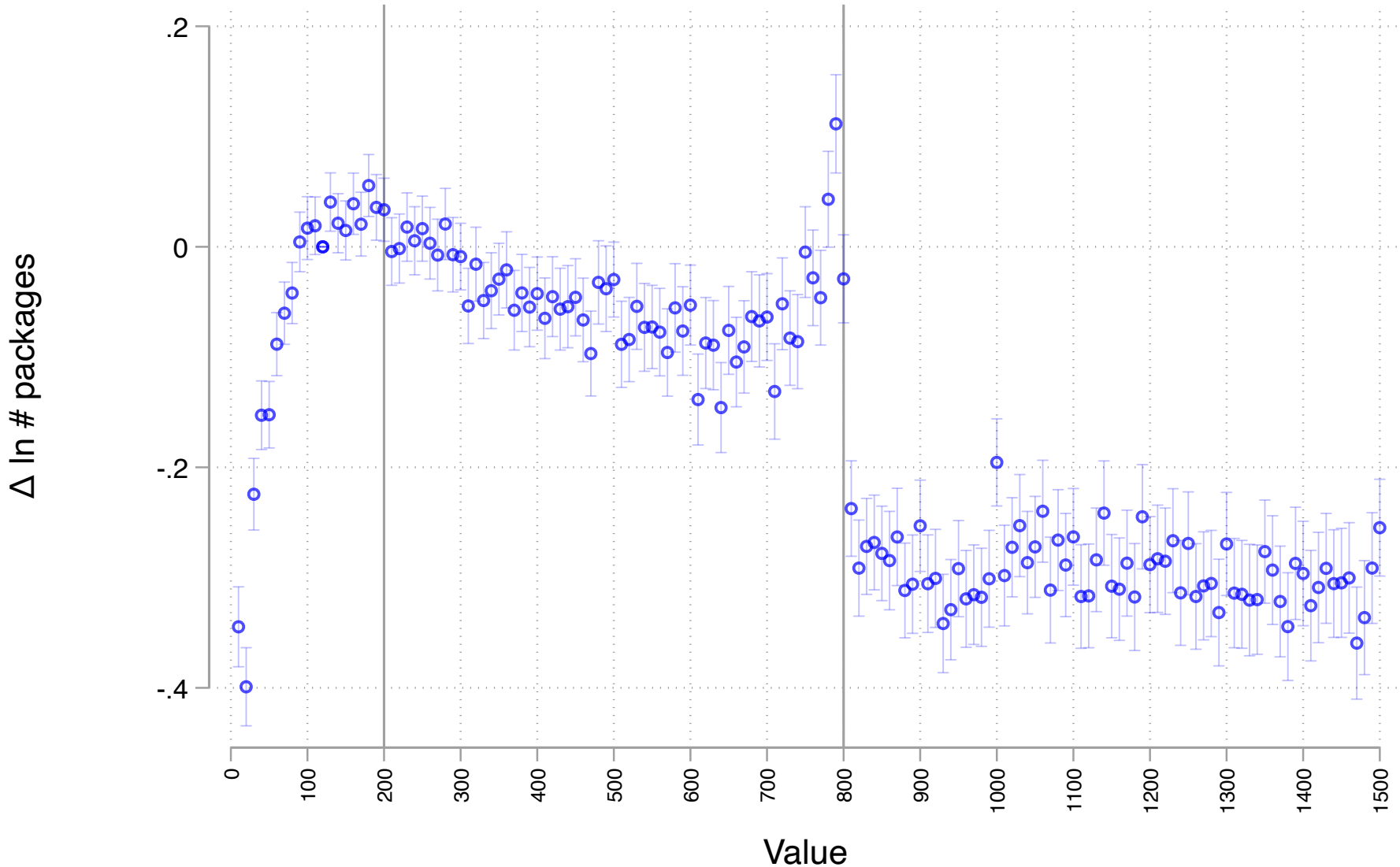
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b \times USA_d + \epsilon_{bodxt}$ if post==0



normalized to Δ # packages at $120

Δ Density: USA vs OECD in Post

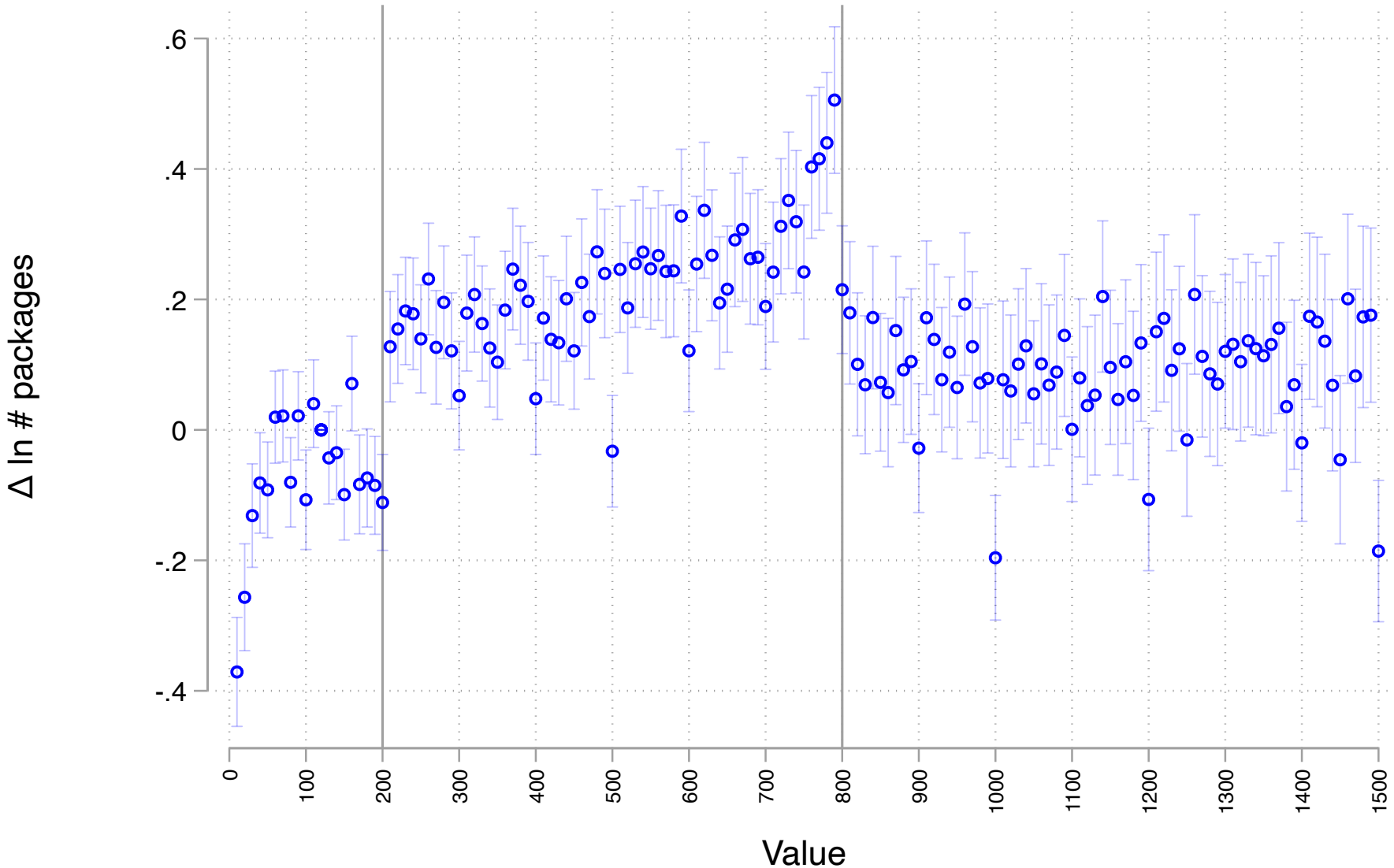
$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b \times USA_d + \epsilon_{bodxt}$ if post==1



normalized to Δ # packages at $120

Difference in Differences (USA vs OECD) vs (Post vs Pre)

$\ln c_{bodxt} = \alpha_{xt} + \alpha_o + \alpha_{dt} + \beta_b \times post_b \times USA_d + \epsilon_{bodxt}$



normalized to Δ # packages at $120

CBP Sample

$\ln c_{bot} = \alpha_o + \alpha_t + \beta_b + \epsilon_{bot}$