EXIM's Exit:
The Real Effects of Trade Financing by Export Credit Agencies

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Imperial

Motivation

Export Credit Agencies (ECAs) aim to increase exports by supplying trade financing

Ubiquitous in both emerging and advanced economies:

- In 90 countries that generate 92% of global exports [Distribution]

The most common tool of **industrial policy** (Juhasz, Lane, Oehlsen, and Perez, 2023)

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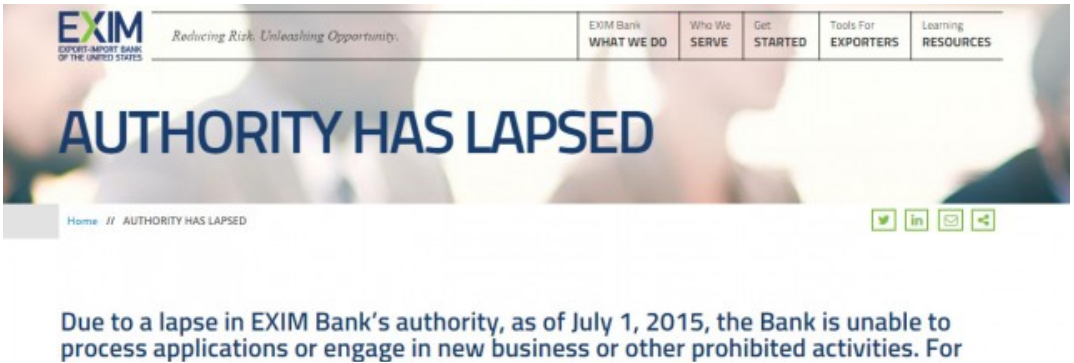
Question: What is their impact?

Context

2015–2019 Shutdown of the Export-Import Bank of the United States (EXIM)



EXIM bank's website, July 2, 2015

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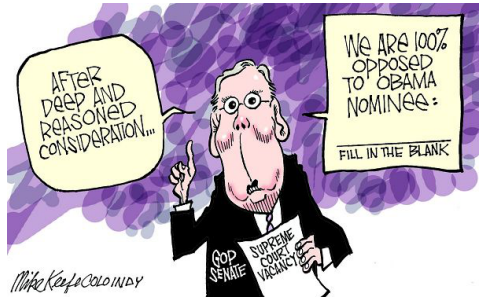
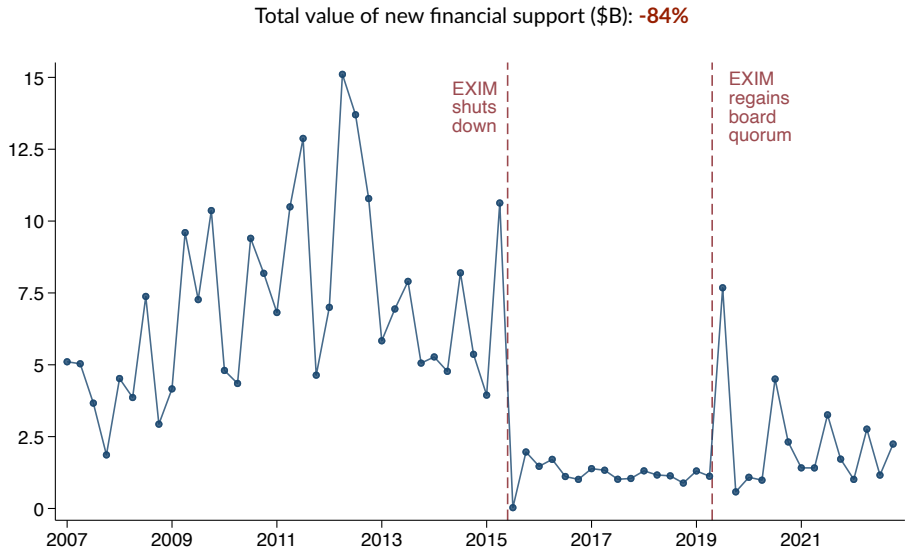
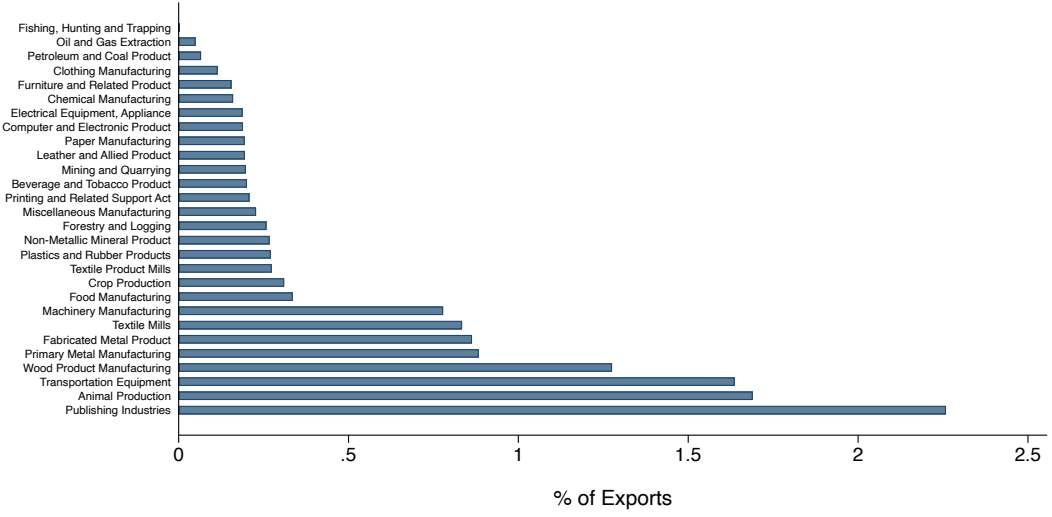
- No quorum on Board (2016–2019):
  Partisan gridlock in Obama presidency



EXIM's shutdown led to a collapse in new trade financing



We use variation in pre-shutdown reliance on EXIM financing



[Full Distribution]

This paper

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   - Firm level: No, exporting firms are unconstrained → EXIM was a "profit windfall"
   - Industry level: No, EXIM reallocated export market share (business stealing) → did not create trade

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   - Firm level: ⇓ exports, total revenues, K, L
   - Industry level: ⇓ $1 financing = ⇓ $5 exports

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3. What framework rationalizes these results? **Endogenous wedges in market for trade financing**

Contribution to the literature

1. **Export Credit Agencies**

   Germany (Felbermayr Yalcin, 13); Austria (Badinger Url, 13); Pakistan (Zia, 2008); US (Desai Hines, 08; Benmelech Monteiro, 23)

   → Causal estimates of the impact of ECAs on firms and exports, and impact on misallocation

2. **Finance and Trade**

   Bank credit and export volumes: Amiti Weinstein, 11; Chor Manova, 12; Manova, 13; Paravisini Rappoport Schnabl Wolfenzon, 14; Demir Michalski Ors, 17; Hombert Matray, 18; Xu, 22; Beaumont Lenoir, 23; Bruno Shin, 23; Monteiro Moreira, 23

   Bank networks and export patterns: Michalski Ors, 12; Niepmann Schmidt-Eisenlohr, 17; Paravisini Rappoport Schnabl, 23; Xu Yang, 24

   → Demonstrates specificity of trade financing $\neq$ omnibus firm credit shock

3. **Trade and Misallocation**

   Khandelwal Schott Wei, 13; Chaney 16; De Loecker Goldberg Khandelwal Pavcnik, 16; Berthou Chung Manova Bragard, 20; Finlay, 21; Bai Jin Lu, 24

   → Identifies specific wedges and highlights importance of financing frictions

4. **Design and Effects of industrial policies**

   Harrison Rodriguez-Clare, 10; Juhasz, 18; Itskhoki Moll, 19; Costinot Rodriguez Clare, Werning, 20; Choi Levchenko, 21; Lane, 23; Juhasz Lane Oehlsen Perez, 22; Juhasz Steinwender, 23; Juhasz Lane Rodrik, 23; Ottonello Perez Witheridge 24; Adao Becko Costinot Donaldson, 24; Costinot Bartelme Donaldson Rodriguez-Clare, 24; Ding Matray Mueller Xu, 24

   → Provides framework for discussing ECAs as a tool of industrial policy

Outline

EXIM Institutional Setting & Data

1. The Effect of EXIM's Shutdown on Real Activity

2. EXIM's Shutdown and Capital Misallocation

3. EXIM and the Broader Economy

Conclusion

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The Export-Import Bank of the United States (EXIM)

Mandate:

> "*To support jobs in the United States by facilitating the export of U.S. goods and services [...] when private sector lenders are unable or unwilling to provide financing.*"

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Justification

- Information and contractual frictions large in cross-border transactions
  (e.g., Schmidt-Eisenlohr 2013; Antras and Foley 2015)
- Potentially private bank market power (concentration + extreme specialization) in trade finance
  (e.g., Niepmann and Schmidt-Eisenlohr, 2017; Paravisini, Rappoport and Schnabl, 2023)

$\Longrightarrow$ **Underprovision** by private sector

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EXIM's tools: menu of financial instruments [Details]

- Financing and insurance is attached to a specific export transaction
- **Example**: Working capital loan approved on 12/13/2006
  - Exporter: "Lindsey Manufacturing Co"
  - Amount: $1.8 M
  - Product: "Power, Distribution, and Specialty Transformer Manufacturing (NAICS=335311)"

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EXIM's differences: US government agency debt

- Coverage: more comprehensive
- Information: statutory interagency cooperation with Departments of State, Treasury, Commerce

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> "*To support jobs in the United States by facilitating the export of U.S. goods and services [...] when private sector lenders are unable or unwilling to provide financing.*"

Operational constraints:

- Maximum default rate of 2%, set by Congress
- Institution must be "subsidy neutral" (WTO, OECD, US Federal Credit Reform Act)
  - Fees & interest collected must offset: cost of borrowing from US Treasury + defaults + operational expenses

$$\approx \text{US 30yr rate} + 2 \text{ p.p.}$$

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EXIM targets firms that are liquidity constrained but solvent

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Data

- EXIM dependence: EXIM loan registry
  - Loan level data: 2007–2022
  - Matched on export product and firm name
- Aggregate trade flows: BACI
  - Bilateral: country × product × year (2010–2019)
  - Exporters: study USA + other similar developed countries
- Firm outcomes: Compustat
  - Panel: 2010–2019
- Firm exports: Datamyne
  - Universe of maritime exports at the firm × product × destination level

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Effect of EXIM on product-level exports: 2010–2019

Export growth at time t relative to 2014:

$$\frac{X_{p,o,d,t} - X_{p,o,d,2014}}{X_{p,o,d,2014}} = \beta \, \text{EXIM}_{p,o} \times \text{Post}_{t \geq 2015} + \gamma_{p,d,t} + \delta_{o,t} + \varepsilon_{p,o,d,t}$$

- $X_{p,o,d,t}$: Products (HS-6) $\times$ Origin $\times$ Destinations

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β is the effect on exports net of business stealing among US firms

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Challenge with studying bilateral product-level trade flows: Entry & Exit

- **25% "zeros"** in $X_{p,o,d,t}$ over 10 years
  - Standard approach: ad-hoc transformations (log(x+1), asinh) or non-linear estimators (Poisson)

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$$\frac{X_{p,o,d,t} - X_{p,o,d,2014}}{[X_{p,o,d,t} + X_{p,o,d,2014}] \times 0.5} = \boldsymbol{\beta}\, \text{EXIM}_{p,o} \times \text{Post}_{t \geq 2015} + \gamma_{p,d,t} + \delta_{o,t} + \varepsilon_{p,o,d,t}$$

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⇒ Beaumont Matray Xu (2024) midpoint growth rate methodology: estimates aggregate effect & decomposes margins of adjustment [Details]

Identifying assumption

Parallel trends: outcomes between treated ($EXIM_{p,o} > 0$) and control ($EXIM_{p,o} = 0$) groups would have evolved similarly absent the shutdown, after controls

- Treatment defined at product x origin level $\rightarrow$ *not* assuming all products would have evolved similarly

Does not require...

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- Random timing of shutdown
- Product dynamics (p, t) or demand shocks (d, t) uncorrelated with treatment: absorbed by $\gamma_{p,d,t}$

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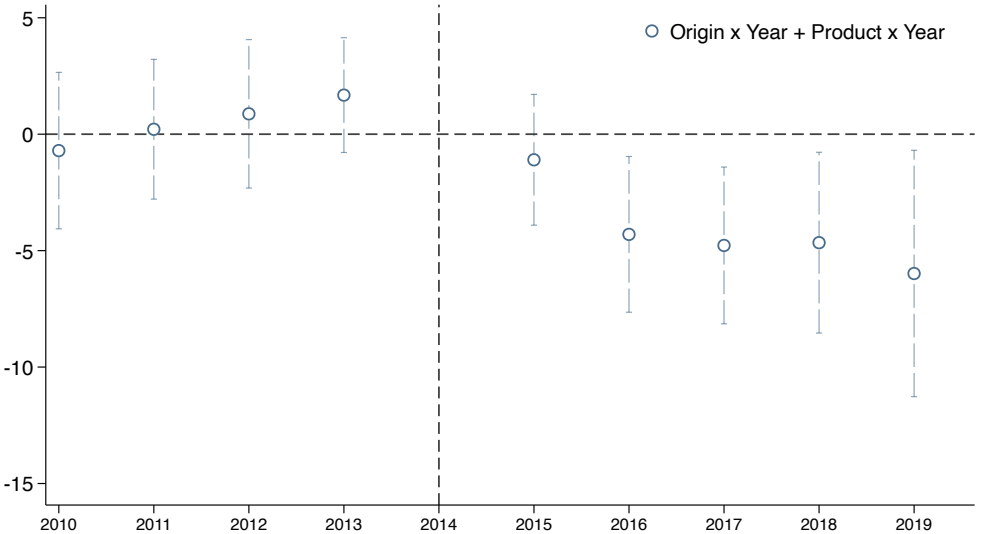
Threats to identification: US product shocks coinciding with EXIM product support post 2015

- Firm level evidence: relaxes this assumption & yields similar results

EXIM shutdown followed by drop in US exports

$$\Delta^{t}_{2014}[X_{p,o,d,t}] = \beta_t \, \text{EXIM}_{p,o} + \delta_{o,t} + \gamma_{p,t} + \varepsilon_{p,o,d,t}$$



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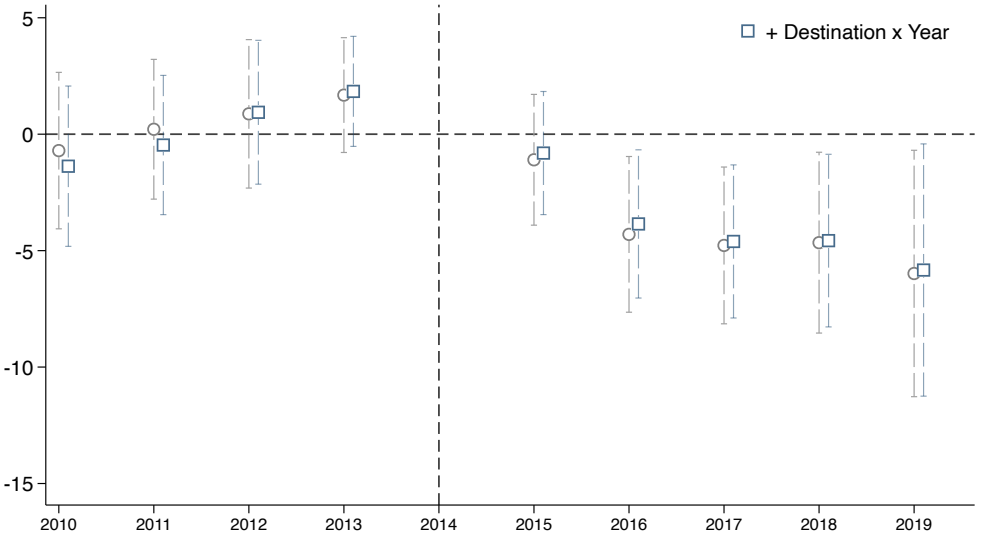

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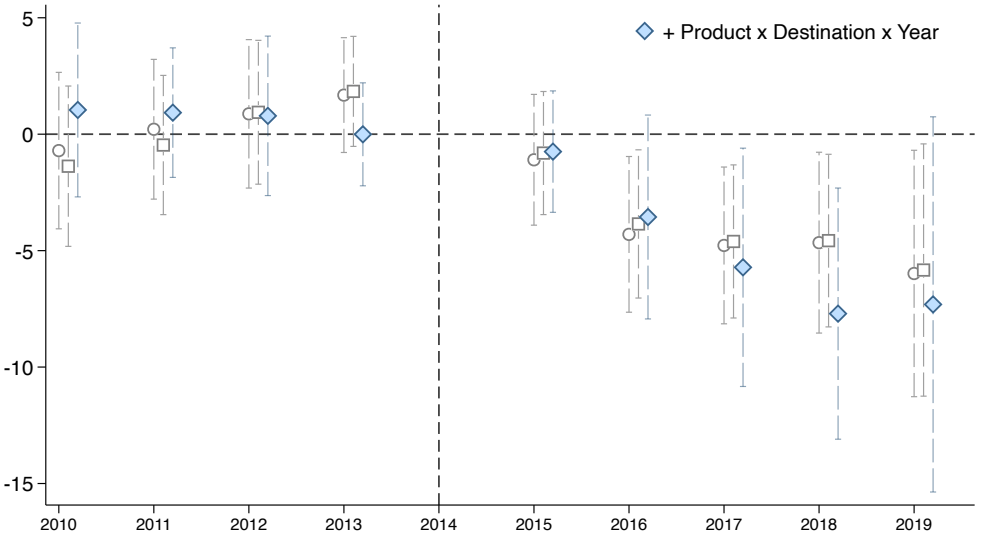

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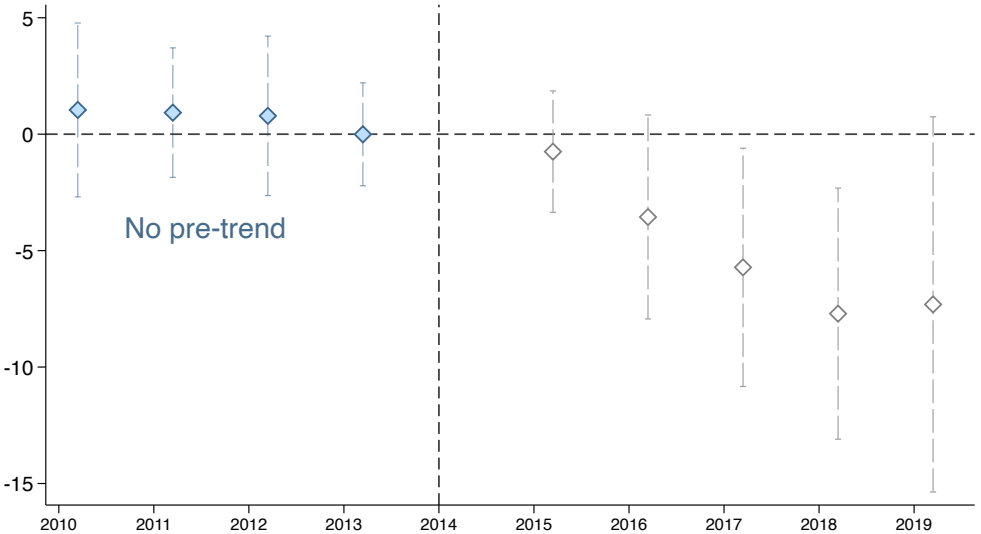

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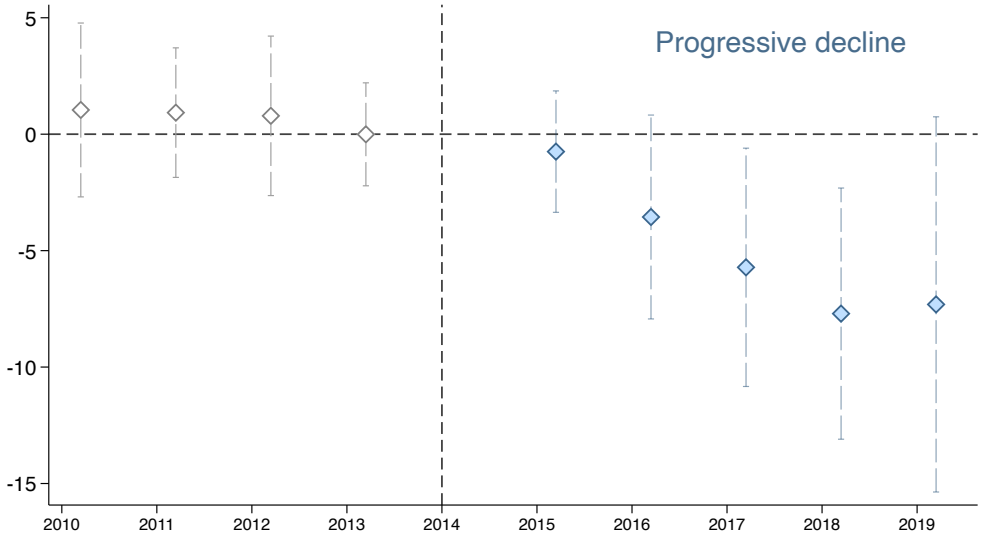

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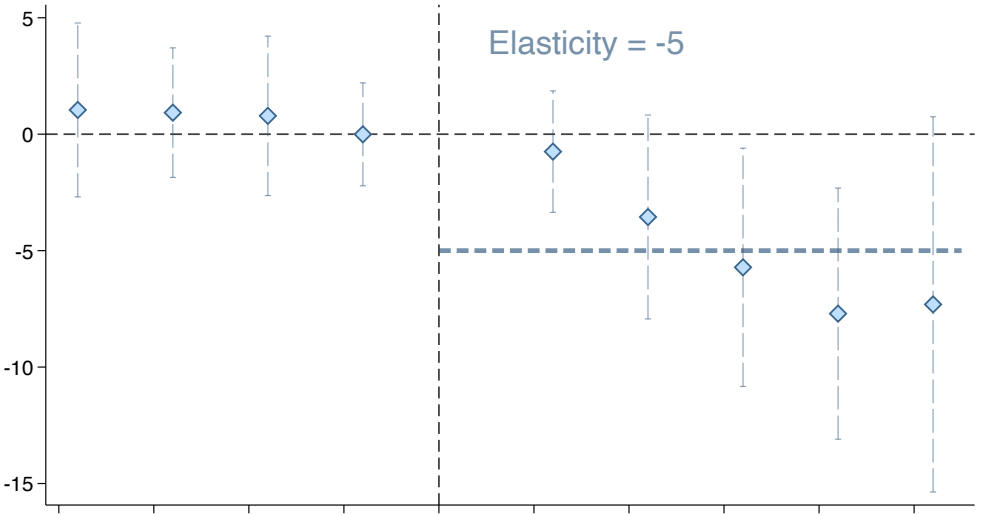
$$\Delta \text{Export} / \text{Export}_{pre} = \beta \ \text{EXIM} / \text{Export}_{pre}$$



Interpreting the magnitudes

Elasticity of response: $\beta_{post} \approx$ **(-4, -5)**

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-$1 financing $\Rightarrow$ (-$4, -$5) export revenues [Working cap = 20%$\times$Y $\Rightarrow \Delta Y = \underbrace{5}_{=(1/0.2)} \times \Delta$Working cap]

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Separately estimate firm level response (bilateral-product maritime exports): $\beta^{firm}_{post} \approx$ -4.6 [Table]

$\Rightarrow$ Business stealing likely limited

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Consequences for firm Y, K, L?

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Firm-level specification: 2010–2019

Growth relative to 2014 of various outcomes Y for firm i in industry j at time t

$$\frac{Y_{i,(j,)t} - Y_{i,(j,)2014}}{Y_{i,(j,)2014}} = \beta\, EXIM_i \times Post_{t \geq 2015} + Exporter_{i,t_0} \times \delta_t + \gamma_{j,t} + X_{i,t_0} \times \delta_t + \varepsilon_{i,(j,)t}$$

- $EXIM_i$: $\mathbb{I}$[EXIM financing $>$ 0 prior to 2014]
- $Exporter_{i,t_0} \times \delta_t$: $\mathbb{I}$[EXIM | foreign sales | exports | taxable foreign income $>$ 0]
- $\gamma_{j,t}$: Industry shocks
- $X_{i,t_0} \times \delta_t$: Additional firm-specific shocks (e.g., propensity to lobby)

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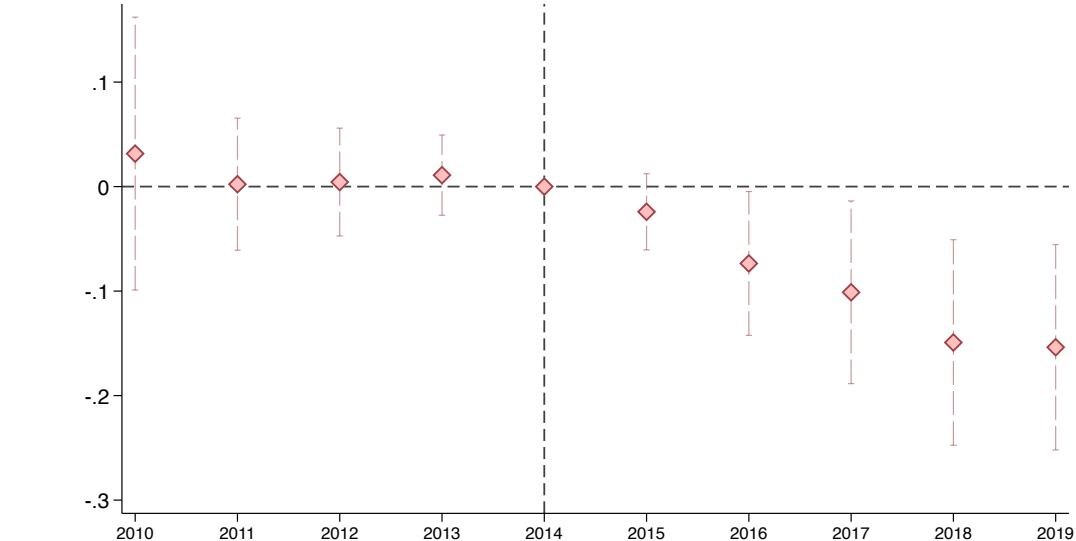
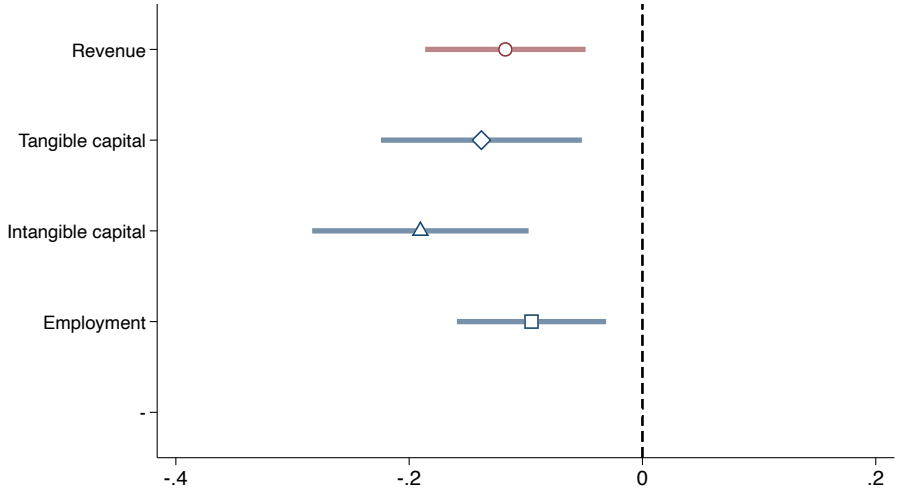
  $\longrightarrow$ Compare treated and control with same government connections

Impact on firms' total revenues: Event study with saturated controls



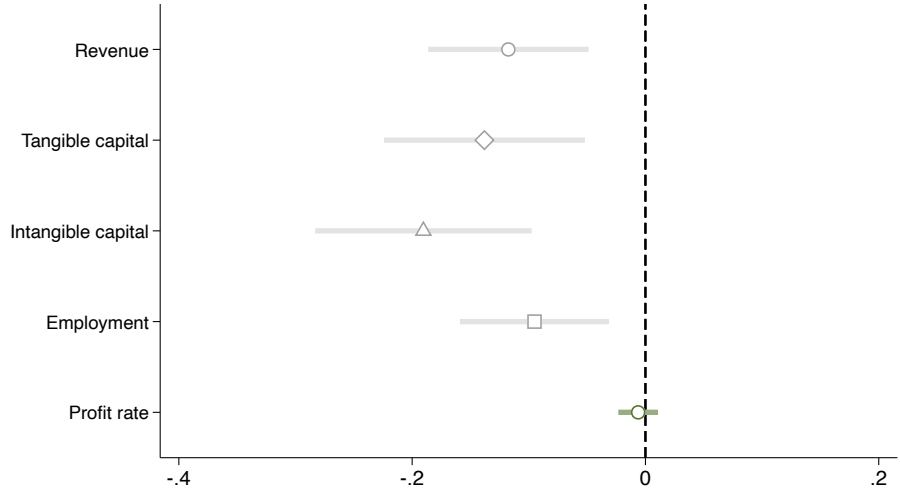
Summary of firm results

- Y, K, L ≈ 11% lower for EXIM-dependent firms



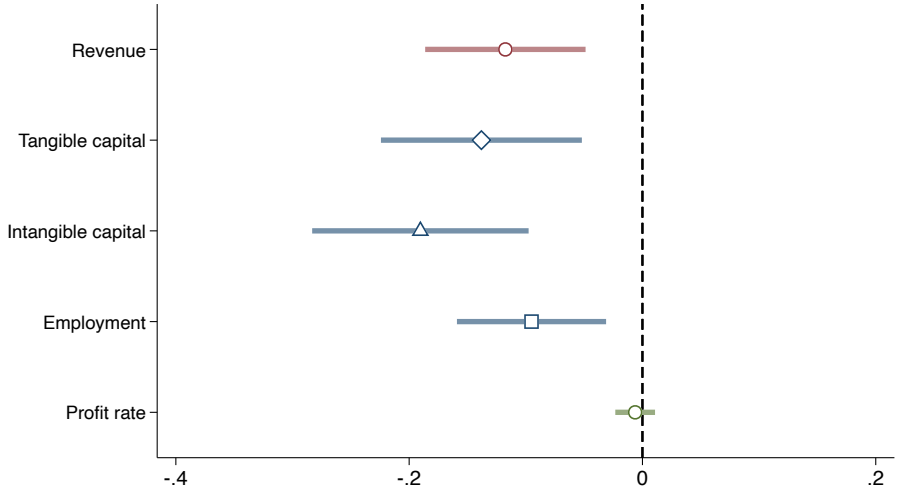
Summary of firm results

- Y, K, L ≈ 11% lower
- Profit rate not affected



Summary of firm results

- Y, K, L $\approx$ 11% lower
- Profit rate not affected $\Rightarrow$ EXIM marginal and **not** profit windfall [Table] [Event study]



Implications for firm production function

So far: $\Downarrow$ Exports $\longrightarrow$ $\Downarrow$ Revenues

$$\Delta \text{ Exports} \times \omega_{Exports} + \Delta \text{ Domestic sales} \times \omega_{Domestic} = \Delta \text{ Revenues}$$

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$$\Delta \text{ Exports} \times \omega_{Exports} + \Delta \text{ Domestic sales} \times \omega_{Domestic} = \Delta \text{ Revenues}$$

Calculate the pass-through of exports to domestic sales:

$$\epsilon_{EXIM}^{domestic} \Big/ \epsilon_{EXIM}^{exports} \approx [0.03\text{–}0.08]$$

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Firm production function

✓ > 0: Within-firm economies of scale — e.g., financing frictions + internal capital market (Stein, 1997; Lamont, 1997)
ex: France and US (Berman, Berthou, Hericourt, 2015; Ding, 2024)

✗ ~~$= 0$: Constant marginal costs~~ (e.g., Melitz, 2003)

✗ ~~< 0: Increasing marginal costs~~ (e.g., Almunia, Antras, Lopez-Rodriguez, Morales, 2021)

Robustness

Aggregate product exports

- Remove products sequentially [Result]
- Different weights [Result]
- Dichotomous treatment $\mathbb{I}(\text{EXIM}_{p,o} > 0.45\%)$: $\beta_{post} \approx$ -6 (Callaway and Sant'Anna, 2021) [Result]

Firm outcomes

- Remove industries sequentially [Result]

  $\rightarrow$ Remove industries dependent on government contracts
- Excluding Boeing [Result]
- Removing the 10 largest beneficiaries [Result]
- Quarterly sales: decline starts exactly after shutdown in June [Result]
- Additional firm controls: lobbying, state, fiscal month, size, profitability, leverage [Result]
- Different level of industry [Result]
- Midpoint growth rate and other winsorizing [Result]
- Estimating EXIM's programs separately [Result]

Outline

EXIM Institutional Setting & Data

1. The Effect of EXIM's Shutdown on Real Activity
   - US product level exports
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Conclusion

EXIM is marginal for the average firm

Empirical results: $\Downarrow$ K + $\not\Delta$ Profit rate

Consistent with firm profit function where EXIM marginal

$$\Pi_i = f_i(K_i) \; - \; r_i \times (1 - EXIM_i \qquad) \times K_i$$

- FOC wrt K_i

$$\underbrace{MRPK_i}_{\text{Marginal revenue return to capital}} \quad = \quad \underbrace{r_i \; \times \; (1 - EXIM_i \qquad)}_{\text{EXIM in marginal cost}}$$

EXIM is marginal for the average firm

Empirical results: $\Downarrow$ K + $\not\Delta$ Profit rate

Consistent with firm profit function where EXIM marginal + possible input cost wedge τ_i

$$\Pi_i = f_i(K_i) \; - \; r_i \times (1 - EXIM_i + \tau_i) \times K_i$$

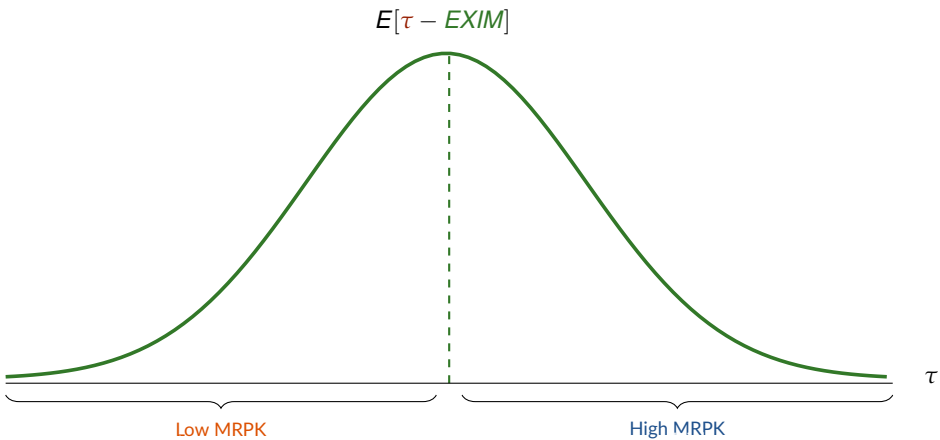
- FOC wrt K_i

$$\underbrace{MRPK_i}_{\text{Marginal revenue return to capital}} = \underbrace{r_i \times (1 - EXIM_i + \tau_i)}_{\text{EXIM in marginal cost}}$$

Effect on Δ misallocation? $\rightarrow$ Heterogeneous τ_i (e.g., Hsieh Klenow 09; Moll, 14; Baqaee Farhi 20; Bau Matray 23)

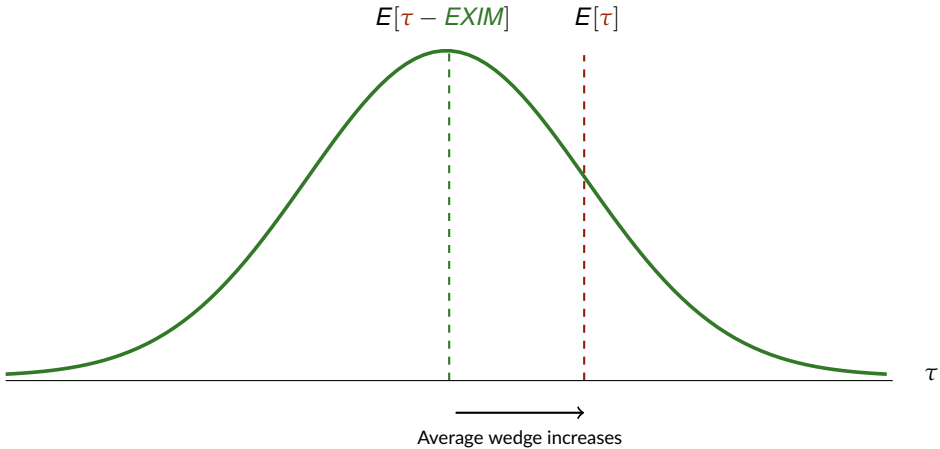
Capital misallocation in industry J

$$\forall i \in J, \ \ MRPK_i = r_i \times (1 + \tau_i - EXIM_i)$$



⇑ Average wedge in industry J during EXIM's shutdown

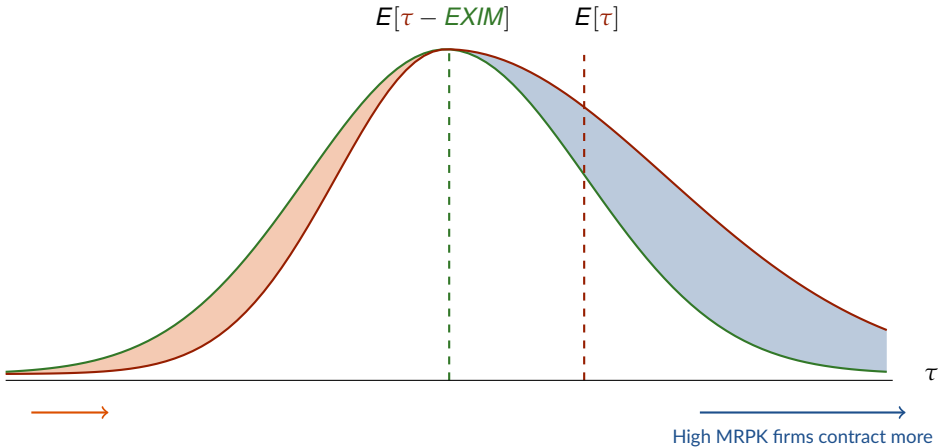
$$\forall i \in J, \quad MRPK_i = r_i \times (1 + \tau_i - \cancel{EXIM_i})$$



Δ Misallocation in industry J during EXIM's shutdown?

$$\forall i \in J, \quad MRPK_i = r_i \times (1 + \tau_i - \cancel{EXIM_i})$$

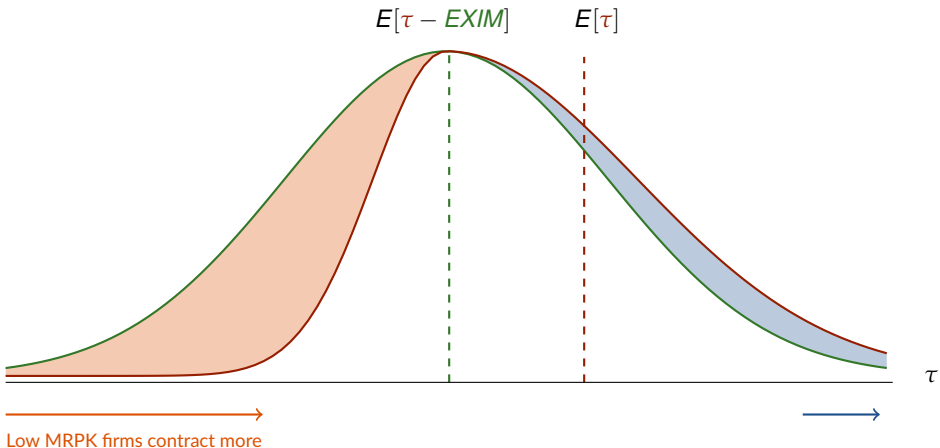
Case 1: Average K decreases, Misallocation increases



Δ Misallocation in industry J during EXIM's shutdown?

$$\forall i \in J, \quad MRPK_i = r_i \times (1 + \tau_i - \cancel{EXIM_i})$$

Case 2: Average K <u>decreases</u>, Misallocation decreases



Estimation strategy from Bau Matray (2023)

Distributional effect of the shock:

$$\Delta K_{i,(j,)t} = \beta_1 \, EXIM_i \times Post_{t \geq 2015} \times I_i^{High\,MRPK_{i \in j}} + \beta_2 \, EXIM_i \times \delta_t + I_i^{High\,MRPK_{i \in j}} \otimes \left[\gamma_{j,t} + Exporter_{i,t_0} \times \delta_t + X_{i,t_0} \times \delta_t \right] + \varepsilon_{i,(j,)t}$$

$High\,MRPK_{i \in j}$: Firm's average MRPK in 2010–2013 $>$ median in cell j (e.g., 4-digit industry)

$I_i^{High\,MRPK_{i \in j}} \otimes \left[X_{i,t_0} \times \delta_t \right]$: Control for shocks specifics to high MRPK firms

β_1 : Triple difference estimate = Δ misallocation
$\rightarrow$ (High - low) in treated vs control. Not high vs low.

$\Delta K_{i,j,t}$: Within-firm changes $\Rightarrow$ remove cross-sectional differences

Estimation strategy from Bau Matray (2023)

Distributional effect of the shock:

$$\Delta K_{i,(j,)t} = \beta_1 \, EXIM_i \times Post_{t \geq 2015} \times I_i^{High\,MRPK_{i \in j}}$$
$$+\beta_2 \, EXIM_i \times \delta_t + I_i^{High\,MRPK_{i \in j}} \otimes \left[\gamma_{j,t} + Exporter_{i,t_0} \times \delta_t + X_{i,t_0} \times \delta_t \right] + \varepsilon_{i,(j,)t}$$

Sufficient to recover Δ "allocative efficiency" in first order approximation effect of shock on TFP

(Petrin Levinsohn 2012; Baqaee Farhi 2019; Bau Matray 2023)

$$\Delta \, Allocative\ efficiency_{J,t} \approx \sum_{i \in J} \frac{\tau_i}{1 + \tau_i} \Delta K_i$$

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$$\Delta K_{i,(j,)t} = \beta_1 \, EXIM_i \times Post_{t \geq 2015} \times I_i^{High\,MRPK_{i \in j}}$$
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This empirical approach deals with standard problems in estimating Δ misallocation

1. Cross-sectional differences do not recover τ

   $\longrightarrow$ Use *within-firm* changes

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This empirical approach deals with standard problems in estimating Δ misallocation

1. Cross-sectional differences do not recover τ

   $\longrightarrow$ Use *within-firm* changes

2. Δ Var[MRPK] = Δ misallocation only under strong assumptions such as: TFPQ & TFPR jointly log-normal

   $\longrightarrow$ Does not require those assumptions

Estimation strategy from Bau Matray (2023)

Distributional effect of the shock:

$$\Delta K_{i,(j,)t} = \beta_1 \, EXIM_i \times Post_{t \geq 2015} \times I_i^{High\,MRPK_{i \in j}}$$
$$+\beta_2 \, EXIM_i \times \delta_t + I_i^{High\,MRPK_{i \in j}} \otimes \left[\gamma_{j,t} + Exporter_{i,t_0} \times \delta_t + X_{i,t_0} \times \delta_t\right] + \varepsilon_{i,(j,)t}$$

Measuring MRPK:

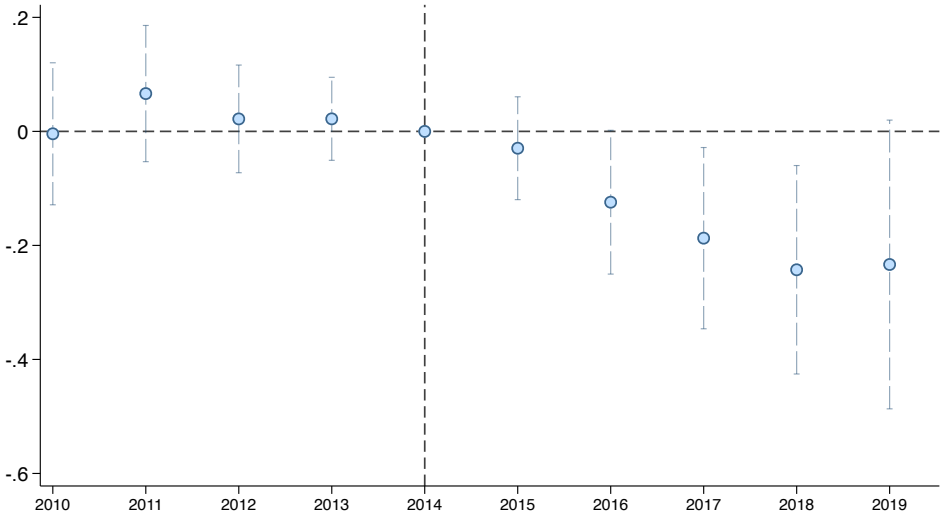
$$Revenue_{ijt} = TFPR_{it} K_{ijt}^{\alpha_j}$$

$$MRPK = \alpha_j \frac{Revenue_{ijt}}{K_{ijt}}$$

$$MRPK \propto \frac{Revenue_{ijt}}{K_{ijt}}$$ within industry or industry$\times$size (j) bin

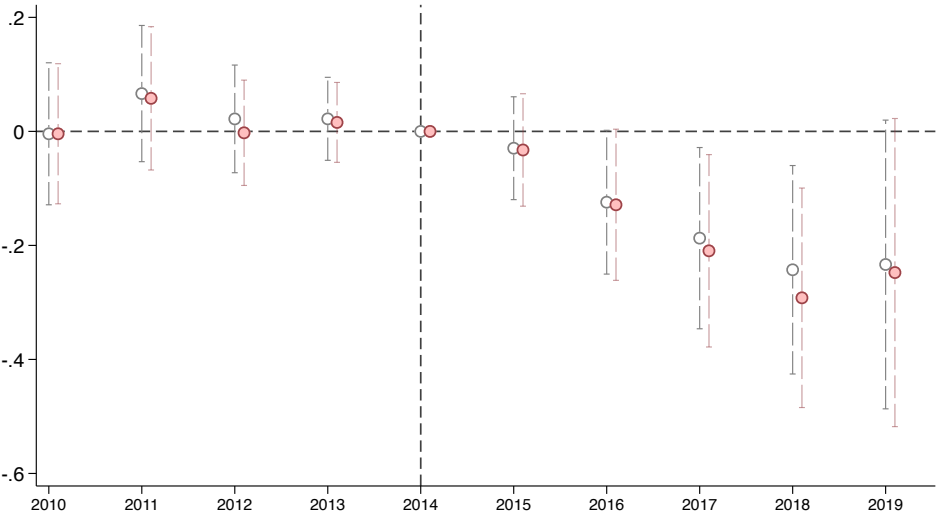
Removing EXIM ⇑ Misallocation within listed firms

$$\beta_1 \; EXIM_i \times Post_{t \geq 2015} \times I_i^{High\ MRPK_{i \in j}} < 0$$



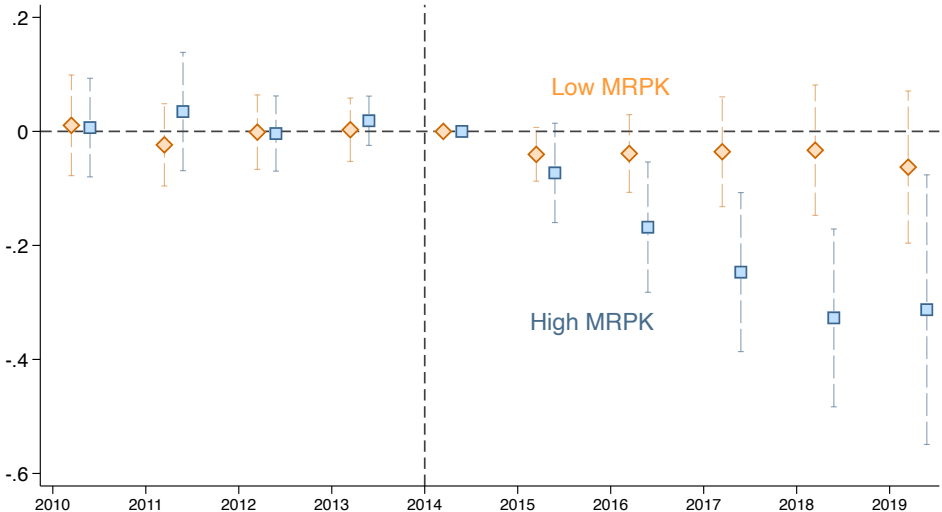
Removing EXIM ⇑ Misallocation within listed firms

Similar effects if we sort MRPK within Industry×Size quartile



Removing EXIM ⇑ Misallocation within listed firms

High MRPK react, not low MRPK ⇒ joint log-normality **not** preserved



Taking stock: Why aren't banks stepping in?

During EXIM's shutdown:

- Average firm contracts
- Driven by high MRPK

} EXIM finances NPV$>$ 0 projects

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- Average firm contracts
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- Firms facing $\tau > 0$: endogenous outcome of private banks maximizing expected profits
  - Incentive compatibility constraint with imperfect contracts
  - High markup due to higher concentration in trade financing (Niepmann Schmidt-Eisenlohr 2017)
- Lack of financing without EXIM therefore reflects structure of the market and initial value of τ

Taking stock: Why aren't banks stepping in?

During EXIM's shutdown:

- Average firm contracts
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What are these constraints τ?

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Sources of $\tau_{i,m}$ in trade financing

For firm *i* selling to market *m*:

Model

$$MRPK_{i,m} = r^{adj}_{i,m} \times (1 + \tau_{i,m} - EXIM_{i,m})$$

as:

$$MRPK_{i,m} = r^{adj}_{i,m} \times (1 + \lambda_i + \eta_m - EXIM_{i,m})$$

1. λ_i : **Firm borrowing constraint**
   - Theoretically: Incomplete contracts / information asymmetry (Stiglitz Weiss 1981; Banerjee Newman 1993)
2. η_m : **Export market constraint**
   - Theoretically: High cross-border contractual frictions with foreign countries (Schmidt-Eisenlohr 2013; Antras Foley 2015)

[1/2] Empirical evidence of sources of $\tau_{i,m}$: λ_i

EXIM's shutdown has **larger effects** for ex-ante more financially constrained (λ_i) firms

Dependent variable	Investment			
Financing frictions proxy:	Leverage	Dividends intensity	Hoberg and Maskimovic (2015)	Coverage ratio
	(1)	(2)	(3)	(4)
$EXIM_i \times \text{Post}_t \times I_i^{\text{Constrained}}$	-0.16***	-0.11***	-0.12***	-0.075**
	(0.044)	(0.039)	(0.047)	(0.039)
Fixed Effects (interacted)				
Exporter × Year	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓
Observations	23,985	23,942	22,285	24,626

[2/2] Empirical evidence of sources of $\tau_{i,m}$: η_m

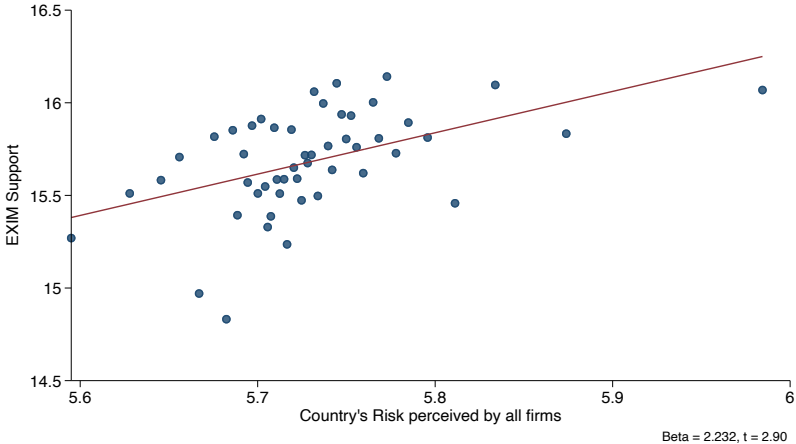
EXIM's shutdown has **larger effects** for destinations with higher trade frictions (η_m)

Dependent variable	Export				
Market frictions proxy:	Risk perception			Rule of law	Financial development
	Any	Financial	Foreign		
	(1)	(2)	(3)	(4)	(5)
$EXIM_{p,o} \times Post_t \times I_d^{Constrained}$	-2.08**	-3.14***	-2.28**	-2.44***	-2.38***
	(0.98)	(1.22)	(1.08)	(0.99)	(0.99)
Fixed Effects					
Product (6-digit) × Destination × Year	✓	✓	✓	✓	✓
Origin × Year × $I_d^{Constrained}$	✓	✓	✓	✓	✓
$EXIM_{p,o} \times Post_t$	✓	✓	✓	✓	✓
Observations	1,661,218	1,661,218	1,661,218	3,341,610	3,255,834

[2/2] Empirical evidence of sources of $\tau_{i,m}$: η_m

Prior to shutdown, EXIM **actively targeted** destinations with higher trade frictions (η_m)

$$Log(EXIM_{d,t}) = \beta \text{ Risk}_{d,t} + \alpha_d + \delta_t + \varepsilon_{d,t}$$



Outline

EXIM Institutional Setting & Data

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2. EXIM's Shutdown and Capital Misallocation

3. EXIM and the Broader Economy

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Total effect of EXIM for the domestic economy?

So far: EXIM's shutdown $\Downarrow$ average output and $\Uparrow$ within-industry misallocation

Total effect will depend on how EXIM interacts with the rest of the economy

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1. Is EXIM self-financing? $\rightarrow$ Distortive taxes needed?
2. Does EXIM crowd out private banks?
3. How do ECA interventions relate to broader industrial policy goals?

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From EXIM's income statements:

- Revenues cover costs: returned $\approx$ $0.5B annually

$\Rightarrow$ Operates within institutional profitability constraints from US federal law and international organizations

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Channels

- EXIM has **lower cost**
  - Theoretically : better cross-border loss recovery technology (e.g., other govt agencies, Paris Club)
  - Empirically : maintain low default rate and high recovery rate

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- EXIM sets **lower markups**
  - Theoretically : extra term in ECA's objective function = α Profits + $(1-\alpha)$ Exports (Fonseca Matray 2024)

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$\Rightarrow$ No need to levy distortive taxes

Total effect of EXIM for the domestic economy?

So far: EXIM's shutdown ⇓ average output and ⇑ within-industry misallocation

Total effect will depend on how EXIM interacts with the rest of the economy

✓ Is EXIM self-financing? ~~→ Distortive taxes needed?~~

2. **Does EXIM crowd out private banks?**

3. How do ECA interventions relate to broader industrial policy goals?

Does EXIM crowd out private banks?

EXIM and private banks operate in segmented markets

EXIM has limited ability to expand

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EXIM's mandate: "to support [...] exports [...] when private sector lenders are unable or unwilling"

- Applicants must provide evidence of failure to secure financing

⇒ EXIM does **not** cream-skim by design

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EXIM and private banks operate in segmented markets

EXIM's mandate: "to support [...] exports [...] when private sector lenders are unable or unwilling"

- Applicants must provide evidence of failure to secure financing

⇒ EXIM does **not** cream-skim by design

EXIM has limited ability to expand

- Profits cannot be accumulated over time (remitted annually to US Treasury)
- Annual balance sheet size determined by Congressional budgeting process

Total effect of EXIM for the domestic economy?

So far: EXIM's shutdown ⇓ average output and ⇑ within-industry misallocation

Total effect will depend on how EXIM interacts with the rest of the economy

✓ Is EXIM self-financing? ~~→ Distortive taxes needed?~~

✗ Does EXIM crowd out private banks?

3. **How do ECA interventions relate to broader industrial policy goals?**

ECAs and industrial policy

ECA support could be used for classical industrial policy objectives targeting "social" wedges τ_s

- Industry (p)
- Market (m)
- Dynamics (t)

Positive correlation between $\tau_{i,m}$ and social wedges τ^s $\rightarrow$ EXIM targets both objectives

Stay Tuned!

- Spillover effects of EXIM onto other firms? Using US Census data
- Correlation between reducing trade financing wedges and supporting industries with positive externalities?
- Complementarity of EXIM with private banks? Using Federal Reserve Y-14 data
- Long-run role of ECAs in shaping cross-country capital flows & trade patterns
  - ECA funding $>$ sovereign debt funds for many countries

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Conclusion

US EXIM shutdown had large average and allocative effects in a context with

- Developed financial markets
- Large, publicly listed firms

International trade entails large financing frictions and contractual frictions

- Private markets may have suboptimal provision

$\Longrightarrow$ Role for government intervention in trade financing, as provided by ECAs

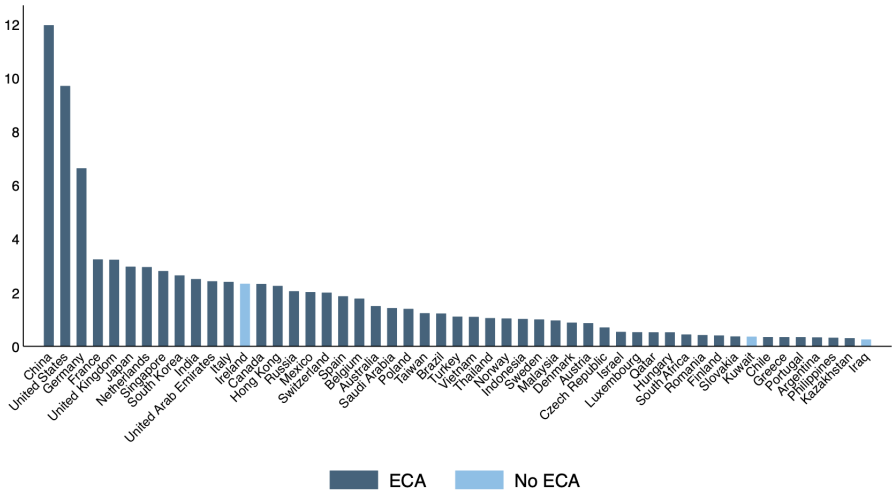
Thank you!

Questions: amatray@berkeley.edu

Appendix Outline

- Institutional Context
  - Distribution of ECAs (1) (2), EXIM Shutdown, EXIM Intensity, EXIM Profitability, EXIM Budget Allocation Process
- Theory
  - Theoretical Predictions for ECA Financing
  - Beaumont, Matray, Xu (2024) estimator and its Aggregation Properties
- Main Figures and Tables
  - Aggregate: Reduction in US Exports in Custom Data, Decomposing Margins of Adjustments, Impact on US Exports of Products
  - Firm-level: Covariate Balance, Total Revenues: Progressive Controls, Event Study: Other Firm Outcomes, Total Revenues: Alternative Samples, Reduction in Maritime Shipments (Datamyne), Treated Firms Scale Down, Domestic Sale Elasticity, Foreign-Domestic Pass-through Shock
- Empirical Robustness
  - Aggregate: Dichotomous Treatment, Different Weighting, Distribution of β and t-stat in Custom Data
  - Firm-level: Event Study: Quarterly Sales, Other Firm Controls, Separate EXIM Programs, Distribution of β and t-stat for Firms, Different Industry Levels, Winsor and Construction for LHS, Different Winsorizing
- Channels for EXIM's Impact
  - Firm Financing Friction (λ_i) Heterogeneity, Destination Country (τ_m) Heterogeneity, Destination Country (τ_m) Risk and EXIM Exposure

Distribution of ECAs

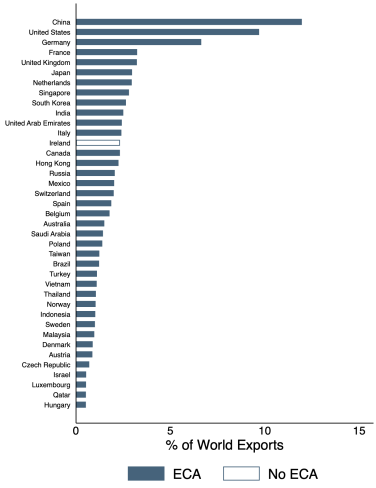


[Back]

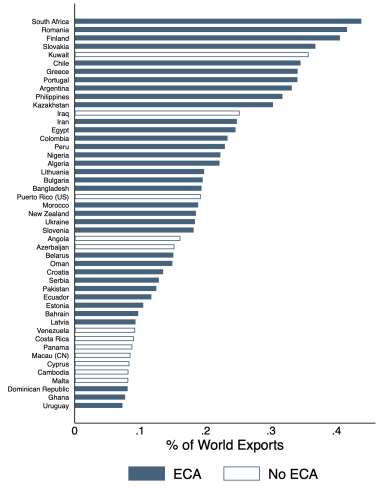
[Back to Appendix Outline]

Distribution of ECAs

(a) Countries with $\geq$ 0.5% of World Exports



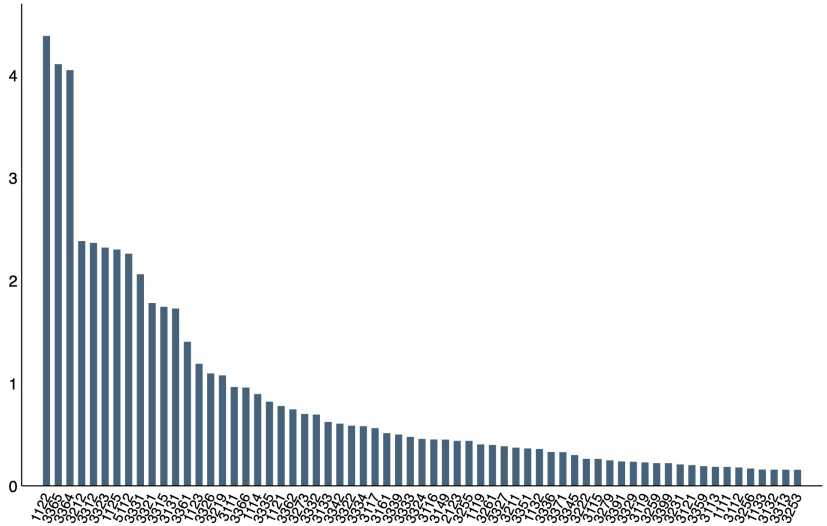
(b) Countries with $<$ 0.5% of World Exports



[Back]

[Back to Appendix Outline]

EXIM Financing Intensity By Industries (%)



[Back]

[Back to Appendix Outline]

EXIM Shutdown

- **2015**: Full shutdown of EXIM for five months
  - Driven by Tea Party (Paul Ryan) criticizing the bank for "*providing corporate welfare*"

- **2015 – 2019**: Very limited capacity for four years
  - Republicans blocked nomination of vacant seats $\Rightarrow$ No board quorum

[Back]

[Back to Appendix Outline]

EXIM Tools

- **Working Capital Guarantee**:

  "EXIM provides repayment guarantees to lenders on secured, short-term working capital loans ... for a single loan or a revolving line of credit... EXIM generally provides a 90% loan-backing guarantee to the lender."

- **Export Credit Insurance**:

  "EXIM... [insures U.S. exporters] against the risk of foreign buyer or other foreign debtor default for political or commercial reasons. This risk protection permits exporters to extend credit to their international customers where it would otherwise not be possible. Insurance policies may apply to shipments to one or multiple buyers, insure comprehensive credit risks (including both commercial and political) or only political risks, offer either shortterm or medium-term coverage, and are primarily U.S.- dollar transactions."

- **Loan Guarantee**:

  "EXIM loan guarantees cover the repayment risks on the foreign buyer's debts when purchasing U.S. exports. EXIM guarantees to a commercial lender that, in the event of a payment default by the borrower, it will pay to the lender the outstanding principal and interest on the loan. For medium- and long-term transactions, EXIM generally provides an 85% guarantee, with a 15% down payment from the buyer."

- **Direct Loans**:

  "EXIM offers fixed-rate loans directly to foreign buyers of U.S. goods and services. EXIM extends to a company's foreign customer a fixed-rate loan generally covering up to 85% of the U.S. contract value. The fixed interest rates are determined through the Arrangement on Guidelines for Officially Supported Export Credits (the Arrangement) negotiated among members of the OECD."

[Back]

[Back to Appendix Outline]

Theory: The Impact of ECA Financing on Firm Outcomes

- Setup:
  - Entrepreneurs with no initial wealth own production technology $f(K)$ with $f'(K) > 0, f''(K) < 0$
  - At most $D_{i,m}$ of outside financing can be raised at a flat rate $r_{i,m}$ to invest in capital of the firm.
- Without ECAs, firm maximizes

$$\begin{aligned} \max_{K_{i,m}} \quad & \Pi_{i,m} = f(K_{i,m}) - r_{i,m} \times K_{i,m} \\ \text{s.t.} \quad & K_{i,m} \leq D_{i,m} \end{aligned}$$

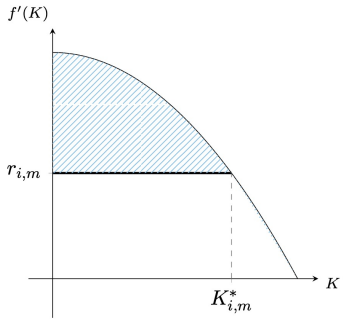
- Define a firm as being constrained if it is only able to raise funding to some level $D^{\tau}_{i,m} <$ its optimal unconstrained level $D^{*}_{i,m} = f'^{-1}(r_{i,m})$
- The shadow price of capital for the constrained firm: $r^{\tau}_{i,m} = f'_{i,m}(K^{\tau}_{i,m})$

[Back]

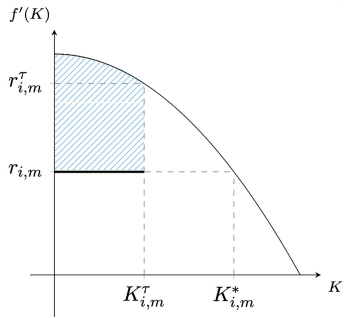
[Back to Appendix Outline]

Theory: The Impact of ECA Financing on Firm Outcomes

(a) Unconstrained without ECAs



(b) Constrained without ECAs



[Back]

[Back to Appendix Outline]

Theory: The Impact of ECA Financing on Firm Outcomes

- With ECA financing, firm maximizes

$$\max_{K_{i,m}, K_{i,m}^{ECA}} \quad \Pi_{i,m} = f(K_{i,m} + K_{i,m}^{ECA}) - r_{i,m} \times K_{i,m} - r_{i,m}^{ECA} \times K_{i,m}^{ECA}$$

$$\text{s.t.} \quad K_{i,m} \leq D_{i,m}$$

$$K_{i,m}^{ECA} \leq D_{i,m}^{ECA}$$

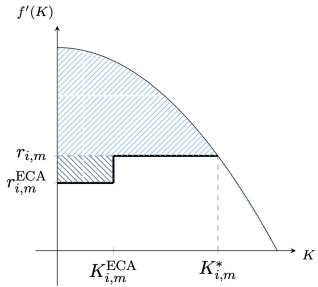
- 3 possible cases:
  - Case 1: Unconstrained firm optimization
  - Case 2: Constrained firm optimization when $r_{i,m}^{ECA} < r_{i,m}$
  - Case 3: Constrained firm optimization when $r_{i,m} < r_{i,m}^{ECA} < r_{i,m}^{\tau}$
- In Cases 2 and 3, ECA financing is not inframarginal!

[Back]

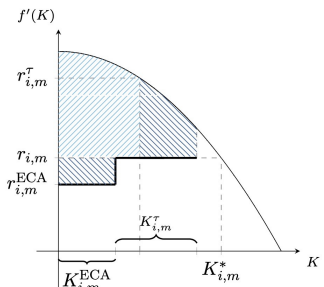
[Back to Appendix Outline]

Theory: The Impact of ECA Financing on Firm Outcomes

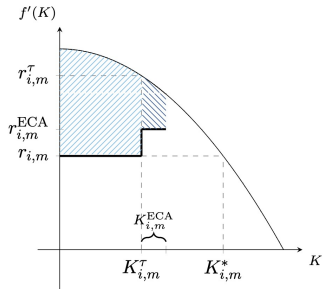
(a) Case 1: Unconstrained



(b) Case 2: Constrained



(c) Case 3: Constrained



[Back]

[Back to Appendix Outline]

A New Solution to Handle Entry and Exit in Trade Data

Beaumont, Matray, Xu (2024): Aggregation property of midpoint growth rate

- **Methodology:**
  - Create balanced panel and fill missing with zeros
  - Define growth rate $\Delta^{t}_{pre}[X_{p,o,d,t}]$ as:

$$\Delta^{t}_{pre}[X_{p,o,d,t}] = \frac{X_{p,o,d,t} - X_{p,o,d,t=pre}}{(X_{p,o,d,t} + X_{p,o,d,t=pre}) \times 0.5}$$

[Back]

[Back to Appendix Outline]

A New Solution to Handle Entry and Exit in Trade Data

Beaumont, Matray, Xu (2024): Aggregation property of midpoint growth rate

- **Methodology:**
  - Create balanced panel and fill missing with zeros
  - Define growth rate $\Delta^{t}_{pre}[X_{p,o,d,t}]$ as:

$$\Delta^{t}_{pre}[X_{p,o,d,t}] = \frac{X_{p,o,d,t} - X_{p,o,d,t=pre}}{(X_{p,o,d,t} + X_{p,o,d,t=pre}) \times 0.5}$$

- **Advantages:**
  1. Recovers full elasticity of intensive + extensive margins ($\neq$ estimating separate elasticities)
  2. Not sensitive to small variations around zero ($\neq$ log transformations)
  3. Is linear and allows perfect (dis)aggregation with appropriate weights ($\neq$ non-linear count models)
- **Estimates:**
  - Aggregate effect: weight by value of cell (denominator) [Details]
  - Decompositions: weights = share of the denominator at the higher cell level [Details] Similar to recent Amiti-Weinstein (2018) estimator, but simpler, linear and naturally bounds extreme growth values

[Back]

[Back to Appendix Outline]

Aggregation Properties of Beaumont Matray Xu (2024) Estimator

Level: Origin×HS-4

Dependent variable	Exports				
Level	O×HS-4				
	(1)	(2)	(3)	(4)	(5)
$EXIM_{p,o} \geq 0.45\% \times Post_t$	-0.065***				
	(0.020)				
Fixed Effects					
Exporter×Year	✓				
Product (4-digit)×Year	✓				
Product (4-digit)×Importer×Year	–				
Product (6-digit)×Importer×Year	–				
Observations	98,671				

[Back]

[Back to Appendix Outline]

Aggregation Properties of Beaumont Matray Xu (2024) Estimator

Level: Origin×HS-6

- Define $A_{p,o,d,t} = (X_{p,o,d,t} + X_{p,o,d,t=pre}) \times 0.5$
- **Aggregation** possible with weights defined as:

$$A_{o,hs6,t} \Big/ \Big(\sum_{hs6 \in [o,hs4,t]} A_{o,hs6,t} \Big)$$

Dependent variable	Exports				
Level	O×HS-4	O×HS-6			
	(1)	(2)	(3)	(4)	(5)
$EXIM_{p,o} \geq 0.45\% \times Post_t$	-0.065***	-0.065***			
	(0.020)	(0.020)			
Fixed Effects					
Exporter×Year	✓	✓			
Product (4-digit)×Year	✓	✓			
Product (4-digit)×Importer×Year	–	–			
Product (6-digit)×Importer×Year	–	–			
Observations	98,671	8,699,645			

[Back]

[Back to Appendix Outline]

Aggregation Properties of Beaumont Matray Xu (2024) Estimator

Level: Origin × HS-6 × Destination

- Define $A_{p,o,d,t} = (X_{p,o,d,t} + X_{p,o,d,t=pre}) \times 0.5$
- **Aggregation** possible with weights defined as:

$$A_{o,hs6,d,t} \Big/ \Big(\sum_{hs6,d \in [o,hs4,t]} A_{o,hs6,d,t} \Big)$$

Dependent variable	Exports				
Level	O × HS-4	O × HS-6	O × HS-6 × Destination		
	(1)	(2)	(3)	(4)	(5)
$EXIM_{p,o} \geq 0.45\% \times Post_t$	-0.065***	-0.065***	-0.065***		
	(0.020)	(0.020)	(0.020)		
Fixed Effects					
Exporter × Year	✓	✓	✓		
Product (4-digit) × Year	✓	✓	✓		
Product (4-digit) × Importer × Year	–	–	–		
Product (6-digit) × Importer × Year	–	–	–		
Observations	98,671	8,699,645	25,086,661		

[Back]

[Back to Appendix Outline]

Aggregation Properties of Beaumont Matray Xu (2024) Estimator

Level: Origin×HS-6×Destination

- Define $A_{p,o,d,t} = (X_{p,o,d,t} + X_{p,o,d,t=pre}) \times 0.5$
- **Additional fixed effects**: cleanly compare the role of unobserved heterogeneity in more aggregate estimates

Dependent variable	Exports				
Level	O×HS-4	O×HS-6	O×HS-6×Destination	O×HS-6×Destination	O×HS-6×Destination
	(1)	(2)	(3)	(4)	(5)
$EXIM_{p,o} \geq 0.45\% \times Post_t$	-0.065***	-0.065***	-0.065***	-0.073***	-0.071***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.019)
Fixed Effects					
Exporter×Year	✓	✓	✓	✓	✓
Product (4-digit)×Year	✓	✓	✓	–	–
Product (4-digit)×Importer×Year	–	–	–	✓	–
Product (6-digit)×Importer×Year	–	–	–	–	✓
Observations	98,671	8,699,645	25,086,661	25,086,661	25,086,661

[Back]

[Back to Appendix Outline]

Reduction in US Exports in Custom Data

Dependent variable	Exports					
Level of aggregation	HS-4	HS-6	HS-6×Destination	HS-6×Destination		
	(1)	(2)	(3)	(4)	(5)	(6)
$EXIM_{p,o} \times Post_t$	-4.40	-4.40	-4.40	-4.16	-5.02	
	(1.57)	(1.57)	(1.57)	(1.64)	(2.40)	
	[0.0052]	[0.0052]	[0.0052]	[0.011]	[0.037]	
$EXIM_{p,o} \geq 0.45\% \times Post_t$						-0.062
						(0.020)
						[0.0017]
Fixed Effects						
Exporter×Year	✓	✓	✓	✓	✓	✓
Product (4-digit)×Year	✓	✓	✓	–	–	–
Product (6-digit)×Year	–	–	–	✓	–	–
Product (6-digit)×Importer×Year	–	–	–	–	✓	✓
Observations	109,199	8,419,512	23,775,713	23,775,713	23,775,713	23,775,713

[Back]

[Back to Appendix Outline]

Decomposing Margins of Adjustments

Decompose $\Delta X_{p,o} = \Delta Intensive_{p,o,d} + \Delta Entry_{p,o,d} + \Delta Exit_{p,o,d}$

- Overall effect: Treatment variation at Origin$\times$HS-4
- Decomposition of Entry / Exit across destinations

Dependent variable	Exports			
Margin	All			
	(1)			
$EXIM_{p,o \geq 0.45\%} \times Post_t$	-0.052			
	(0.018)			
	[0.0038]			

[Back]

[Back to Appendix Outline]

Decomposing Margins of Adjustments

Decompose $\Delta X_{p,o} = \Delta Intensive_{p,o,d} + \Delta Entry_{p,o,d} + \Delta Exit_{p,o,d}$

- Intensive margin explains 80%

Dependent variable	Exports	
Margin	All	Intensive
	(1)	(2)
$EXIM_{p,o} \geq 0.45\% \times Post_t$	-0.052	-0.042
	(0.018)	(0.017)
	[0.0038]	[0.012]

[Back]

[Back to Appendix Outline]

Decomposing Margins of Adjustments

Decompose $\Delta X_{p,o} = \Delta Intensive_{p,o,d} + \Delta Entry_{p,o,d} + \Delta Exit_{p,o,d}$

- Intensive margin explains 80%
- Extensive margin: ⇓ entry, No Δ exit

} Finance matters for variable + sunk costs of trade (e.g., Xu, 2022)

Dependent variable	Exports			
Margin	All	Intensive	Exit	Entry
	(1)	(2)	(3)	(4)
$EXIM_{p,o} \geq 0.45\% \times Post_t$	-0.052	-0.042	-0.00039	-0.0099
	(0.018)	(0.017)	(0.0037)	(0.0055)
	[0.0038]	[0.012]	[0.91]	[0.072]

[Back]

[Back to Appendix Outline]

EXIM's Exposure: Continuous vs. Dichotomous

Dependent variable	Δ Exports		
	(1)	(2)	(3)
$EXIM_{p,o} \times Post_t$	-4.40	-5.02	
	(1.57)	(2.40)	
	[0.0052]	[0.037]	
$EXIM_{p,o} \geq 0.45\% \times Post_t$			-0.062
			(0.020)
			[0.0017]
Fixed Effects			
Exporter × Year	✓	✓	✓
Product (4-digit) × Year	✓	–	–
Product (6-digit) × Importer × Year	–	✓	✓
Observations	23,775,713	23,775,713	23,775,713

[Back]

[Back to Appendix Outline]

Reduction of Export in Custom Data: Different Weighting

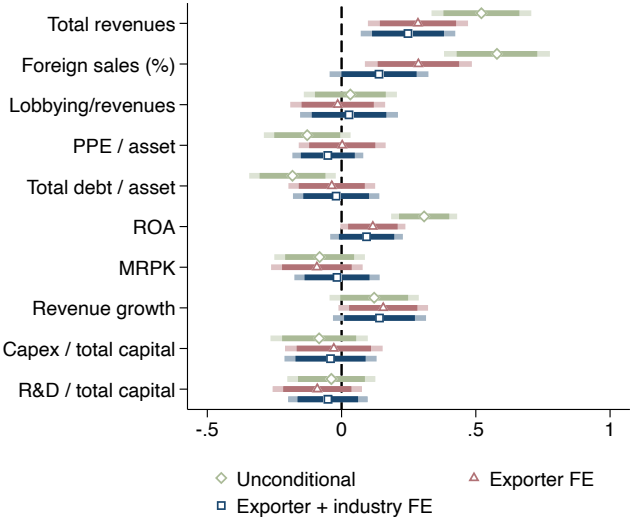
Dependent variable	Δ Exports			
Weighting	EV	VW: 1%	VW, invariant: 5%	VW, invariant: 1%
	(1)	(2)	(3)	(4)
$EXIM_{p,o} \times Post_t$	-3.49	-5.77	-5.29	-5.17
	(1.86)	(2.73)	(2.44)	(2.52)
	[0.061]	[0.034]	[0.030]	[0.040]
Fixed Effects				
Exporter × Year	✓	✓	✓	✓
Product (6-digit) × Importer × Year	✓	✓	✓	✓
Observations	23,775,713	23,775,713	23,775,613	23,775,613

[Back]

[Back to Appendix Outline]

Covariate Balance (2010–2014)

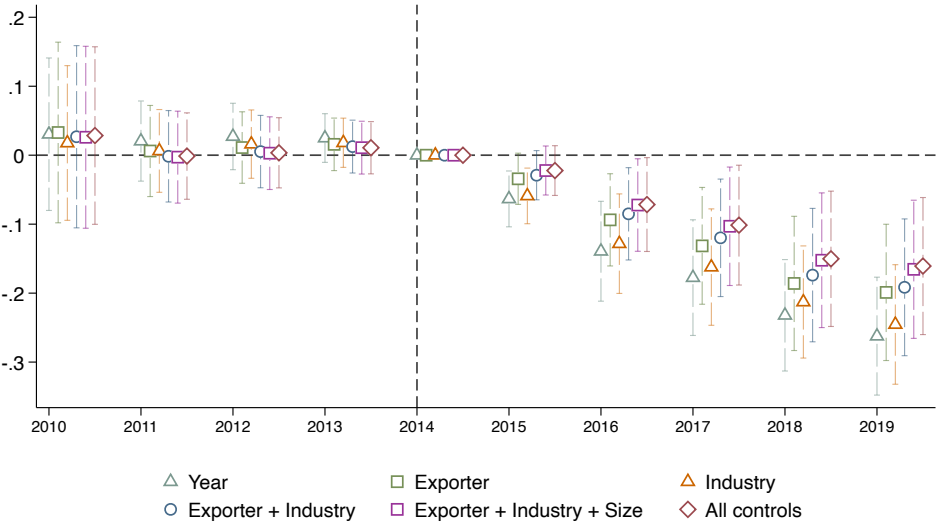
- Control for industry and exporter: within 0.2 standardized band (Imbens and Rubin, 2015)



[Back]

[Back to Appendix Outline]

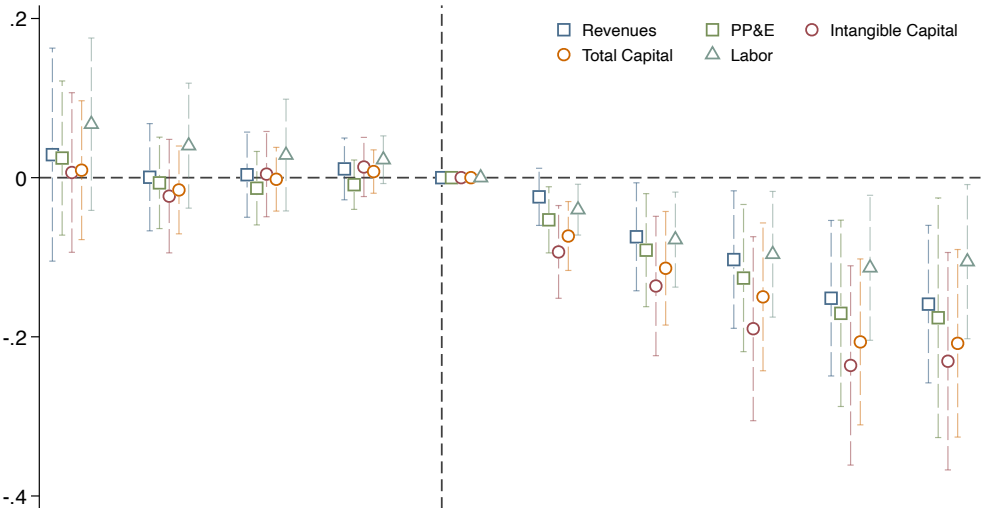
Impact on Firms' Total Revenues: Progressive Controls



[Back]

[Back to Appendix Outline]

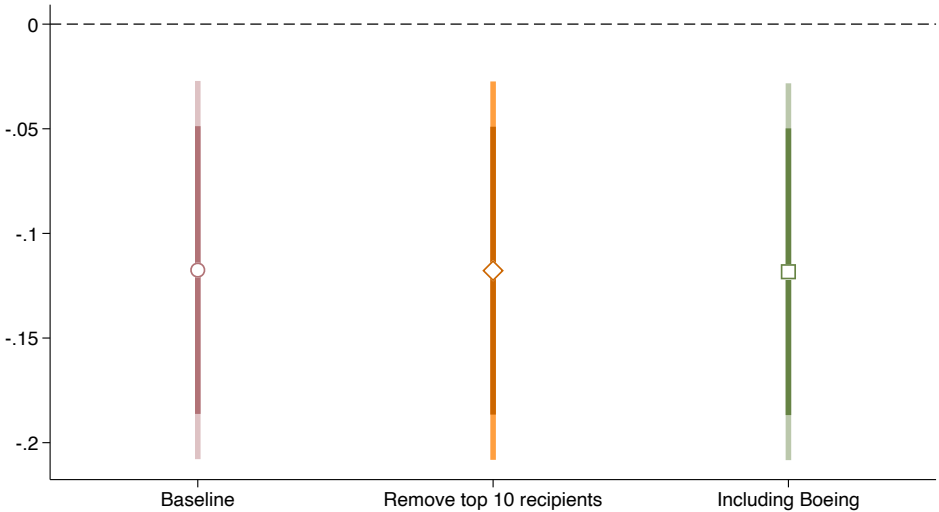
Event Study: Other Firm Outcomes



[Back]

[Back to Appendix Outline]

Impact on Firms' Total Revenues: Alternative Samples



[Back]

[Back to Appendix Outline]

Impact on US Product Exports: Aggregation

Dependent variable	Exports					
Level of aggregation	HS-4	HS-6	HS-6×Destination	HS-6×Destination		
	(1)	(2)	(3)	(4)	(5)	(6)
$EXIM_{p,o} \times Post_t$	-4.40	-4.40	-4.40	-4.16	-5.02	
	(1.57)	(1.57)	(1.57)	(1.64)	(2.40)	
	[0.0052]	[0.0052]	[0.0052]	[0.011]	[0.037]	
$EXIM_{p,o} \geq 0.45\% \times Post_t$						-0.062
						(0.020)
						[0.0017]
Fixed Effects						
Exporter×Year	✓	✓	✓	✓	✓	✓
Product (4-digit)×Year	✓	✓	✓	–	–	–
Product (6-digit)×Year	–	–	–	✓	–	–
Product (6-digit)×Importer×Year	–	–	–	–	✓	✓
Observations	109,199	8,419,512	23,775,713	23,775,713	23,775,713	23,775,713

[Back]

[Back to Appendix Outline]

Reduction in Maritime Shipments (Datamyne)

Dependent variable	Maritime Exports					
Sample	Listed + private firms					Listed firms
	(1)	(2)	(3)	(4)	(5)	(6)
$EXIM_i \times Post_t$	-0.33	-0.33	-0.33	-0.32	-0.29	-0.27
	(0.050)	(0.050)	(0.049)	(0.049)	(0.045)	(0.14)
	[7.9e-11]	[7.9e-11]	[1.6e-11]	[6.0e-11]	[9.4e-11]	[0.045]
Fixed Effects						
Post	✓	✓	–	–	–	–
Product × Post	–	–	✓	–	–	–
Destination × Post	–	–	–	✓	–	–
Product × Destination × Post	–	–	–	–	✓	✓
Observations	79,980	1,832,551	1,832,551	1,832,551	1,832,551	145,709

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

Decrease in total revenue $\Rightarrow$ firms cannot vent foreign sales domestically

Dependent variable	Revenues
	(1)
$EXIM_i \times Post_t$	-0.12
	(0.035)
	[0.00072]
Fixed Effects	
Exporter $\times$ Year	✓
Industry $\times$ Year	✓
Observations	25,174

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

Decrease in capital, tangible and intangible (Peters and Taylor 2017)

Dependent variable	Revenues	Tangible capital	Intangible capital		
	(1)	(2)	(3)		
$EXIM_i \times Post_t$	-0.12	-0.14	-0.19		
	(0.035)	(0.044)	(0.047)		
	[0.00072]	[0.0014]	[0.000042]		
Fixed Effects					
Exporter × Year	✓	✓	✓		
Industry × Year	✓	✓	✓		
Observations	25,174	24,635	25,015		

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

Decrease in employment

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment
	(1)	(2)	(3)	(4)
$\text{EXIM}_i \times \text{Post}_t$	-0.12	-0.14	-0.19	-0.098
	(0.035)	(0.044)	(0.047)	(0.032)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]
Fixed Effects				
Exporter × Year	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

No change in operational profit margin [Event study]

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
$EXIM_i \times Post_t$	-0.12	-0.14	-0.19	-0.098	-0.0063
	(0.035)	(0.044)	(0.047)	(0.032)	(0.0086)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]	[0.46]
Fixed Effects					
Exporter × Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902	25,174

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

$\Longrightarrow$ EXIM financing **not** infra-marginal $\neq$ profit windfall artificially boosting firms' profitability

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
$\text{EXIM}_i \times \text{Post}_t$	-0.12	-0.14	-0.19	-0.098	-0.0063
	(0.035)	(0.044)	(0.047)	(0.032)	(0.0086)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]	[0.46]
Fixed Effects					
Exporter $\times$ Year	✓	✓	✓	✓	✓
Industry $\times$ Year	✓	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902	25,174

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

Decrease in total revenue ⇒ firms cannot vent foreign sales domestically

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
$EXIM_i \times Post_t$	-0.12	-0.14	-0.19	-0.098	-0.0063
	(0.035)	(0.044)	(0.047)	(0.032)	(0.0086)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]	[0.46]
Fixed Effects					
Exporter × Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902	25,174

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

Decrease in capital, tangible and intangible (Peters and Taylor 2017)

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
$EXIM_i \times Post_t$	-0.12	-0.14	-0.19	-0.098	-0.0063
	(0.035)	(0.044)	(0.047)	(0.032)	(0.0086)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]	[0.46]
Fixed Effects					
Exporter × Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902	25,174

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

Decrease in employment

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
$EXIM_i \times Post_t$	-0.12	-0.14	-0.19	-0.098	-0.0063
	(0.035)	(0.044)	(0.047)	(0.032)	(0.0086)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]	[0.46]
Fixed Effects					
Exporter × Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902	25,174

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

No change in operational profit margin [Event study]

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
$EXIM_i \times Post_t$	-0.12	-0.14	-0.19	-0.098	-0.0063
	(0.035)	(0.044)	(0.047)	(0.032)	(0.0086)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]	[0.46]
Fixed Effects					
Exporter × Year	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902	25,174

[Back]

[Back to Appendix Outline]

Additional Effects on Firms: Treated Firms Scale Down

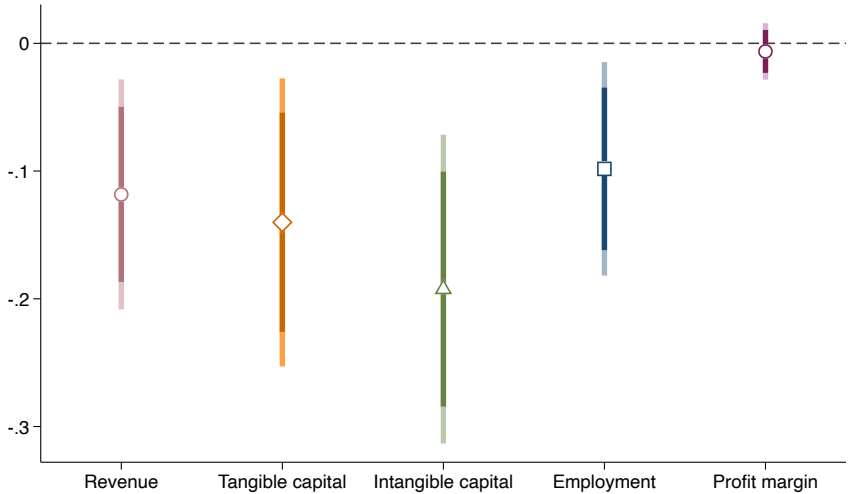
$\Longrightarrow$ EXIM financing **not** infra-marginal $\neq$ profit windfall artificially boosting firms' profitability

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
$\text{EXIM}_i \times \text{Post}_t$	-0.12	-0.14	-0.19	-0.098	-0.0063
	(0.035)	(0.044)	(0.047)	(0.032)	(0.0086)
	[0.00072]	[0.0014]	[0.000042]	[0.0025]	[0.46]
Fixed Effects					
Exporter $\times$ Year	✓	✓	✓	✓	✓
Industry $\times$ Year	✓	✓	✓	✓	✓
Observations	25,174	24,635	25,015	22,902	25,174

[Back]

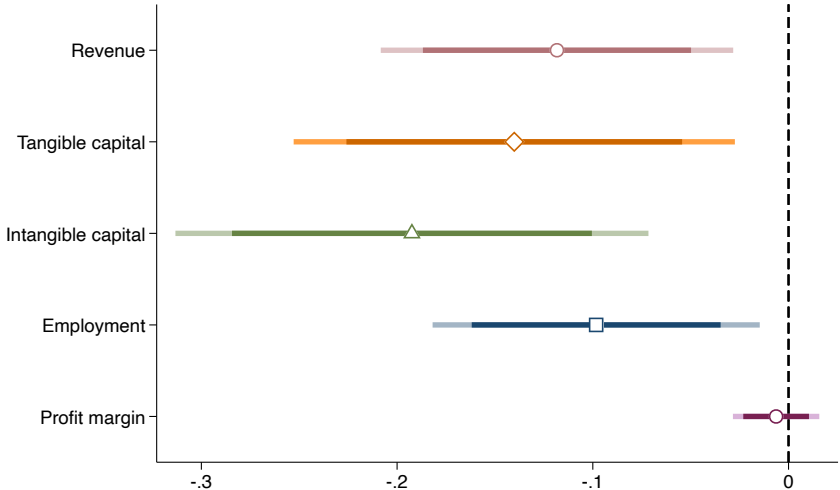
[Back to Appendix Outline]

Alternative Presentation: Additional Effects on Firms: Treated Firms Scale Down



[Back to Appendix Outline]

Alternative Presentation: Additional Effects on Firms: Treated Firms Scale Down



[Back to Appendix Outline]

Backing out Domestic Sale Elasticity

- Define:
  - Elasticity of sales in market m with respect to EXIM: $\epsilon^{m}_{EXIM} = \epsilon^{m}$
  - Share of foreign revenues = $\omega_{foreign}$
- Decomposition:

$$\epsilon^{total} = \omega_{foreign} \times \epsilon^{foreign} + (1 - \omega_{foreign}) \times \epsilon^{domestic}$$

[Back]

[Back to Appendix Outline]

Backing out Domestic Sale Elasticity

- Define:

- Decomposition:

$$\epsilon^{total} = \omega_{foreign} \times \epsilon^{foreign} + (1 - \omega_{foreign}) \times \epsilon^{domestic}$$

$$\beta^{firm} = \omega_{foreign} \times \beta^{custom} + (1 - \omega_{foreign}) \times \epsilon^{domestic}$$

[Back]

[Back to Appendix Outline]

Backing out Domestic Sale Elasticity

- Define:

- Decomposition:

$$\epsilon^{total} = \omega_{foreign} \times \epsilon^{foreign} + (1 - \omega_{foreign}) \times \epsilon^{domestic}$$

$$\underbrace{\beta^{firm}}_{\approx 2.4} = \underbrace{\omega_{foreign}}_{[20\%-40\%]} \times \underbrace{\beta^{custom}}_{\approx 5} + \underbrace{(1 - \omega_{foreign})}_{[80\%-60\%]} \times \epsilon^{domestic}$$

= 0.12/5%

[Back]

[Back to Appendix Outline]

Backing out Domestic Sale Elasticity

- Define:

- Decomposition:

$$\epsilon^{total} = \omega_{foreign} \times \epsilon^{foreign} + (1 - \omega_{foreign}) \times \epsilon^{domestic}$$

$$\underbrace{\beta^{firm}}_{\approx 2.4} = \underbrace{\omega_{foreign}}_{[20\%-40\%]} \times \underbrace{\beta^{custom}}_{\approx 5} + \underbrace{(1 - \omega_{foreign})}_{[80\%-60\%]} \times \epsilon^{domestic}$$

= 0.12/5%

$\Rightarrow$ Infer $\epsilon^{domestic} \approx [0.6 - 1.7]$

[Back]

[Back to Appendix Outline]

Discussion Foreign - Domestic Pass-through Shock

- We have: $\epsilon^{domestic} \approx [0.6 - 1.7]$

$\Rightarrow$ Foreign to domestic pass-through $\approx [0.13 - 0.35]$ $(\epsilon^{Domestic}/\epsilon^{Foreign} = [0.7/5 - 1.7/5])$

[Back]

[Back to Appendix Outline]

Discussion Foreign - Domestic Pass-through Shock

- We have: $\epsilon^{domestic} \approx [0.6 - 1.7]$

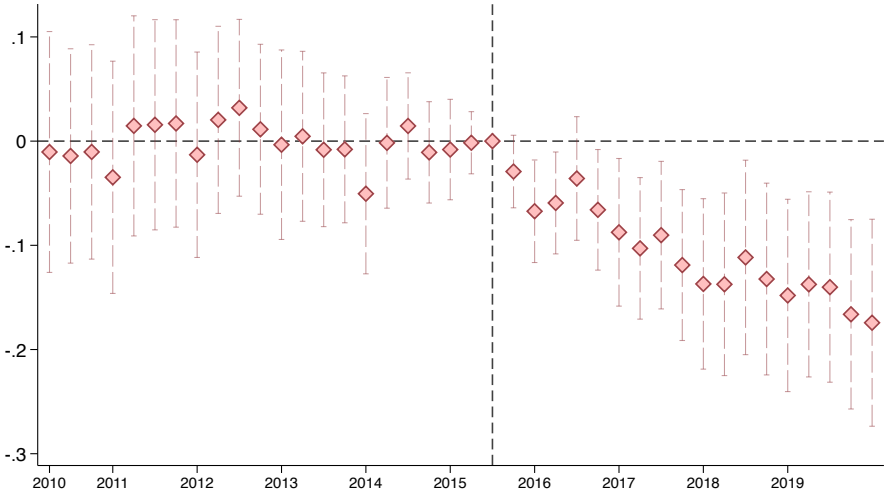
  $\Rightarrow$ Foreign to domestic pass-through $\approx [0.13 - 0.35]$ $(\epsilon^{Domestic}/\epsilon^{Foreign} = [0.7/5 - 1.7/5])$

- Empirics
  - In line with export→domestic estimate: France (Berman, Berthou, Hericourt, 2015), USA (Ding, 2024)
  - Opposite to domestic→export estimate: Spain (Almunia, Antras, Lopez-Rodriguez, Morales, 2021)
- Theory
  - Reject canonical Melitz with constant marginal costs
  - Consistent with models of intra-firm spillovers (i.e., firm level economies of scale & scope)
    - Financing frictions (e.g., Stein, 1997; Lamont, 1997; Giroud Mueller, 2019)
    - Shared non-rival inputs (e.g., Ding, 2024), vertical supply linkages (e.g., Boehm et al, 2019)

[Back]

[Back to Appendix Outline]

Event Study: Quarterly Sales



[Back]

[Back to Appendix Outline]

Robustness: Other Firm Controls

Dependent variable	Total Revenues					
Sample	All					Exc. 10 largest recipients
	(1)	(2)	(3)	(4)	(5)	(6)
$EXIM_i \times Post_t$	-0.12	-0.10	-0.100	-0.13	-0.11	-0.12
	(0.034)	(0.035)	(0.035)	(0.036)	(0.036)	(0.035)
	[0.00071]	[0.0039]	[0.0049]	[0.00048]	[0.0023]	[0.00079]
Fixed Effects						
Exporter × Year	✓	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓	✓
Fiscal month × Year	✓	–	–	–	✓	–
Size × Year	–	✓	✓	–	✓	–
Balance sheet controls × Year	–	–	✓	–	✓	–
Lobbying × Year	–	–	–	✓	✓	–
Observations	25,174	25,174	25,174	25,174	25,174	25,109

[Back]

[Back to Appendix Outline]

EXIM's Shutdown, Separate EXIM Programs

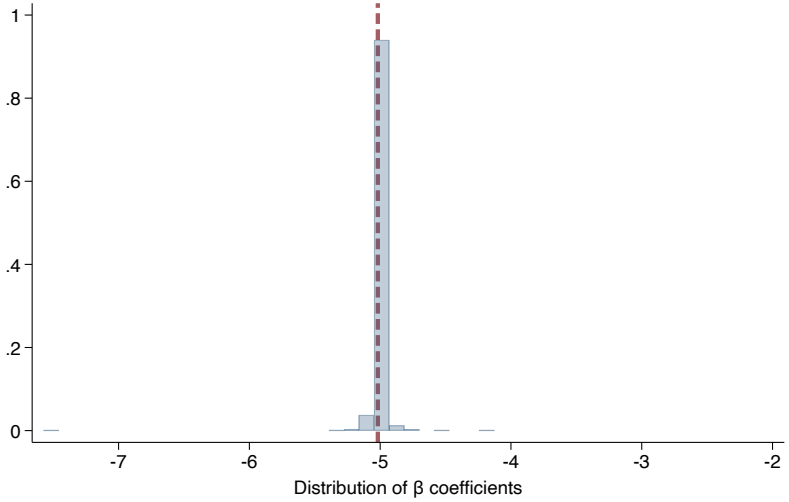
Dependent variable	Total revenues					
Weighting	EW			VW		
	(1)	(2)	(3)	(4)	(5)	(6)
$EXIM_i \times Post_t$	-0.17			-0.15		
	(0.031)			(0.035)		
	[0.000000024]			[0.0000086]		
EXIM (working cap)$_i \times Post_t$		-0.15			-0.12	
		(0.059)			(0.068)	
		[0.011]			[0.087]	
EXIM (insurance)$_i \times Post_t$			-0.17			-0.16
			(0.032)			(0.035)
			[0.000000063]			[0.0000075]
Fixed Effects						
Exporter × Year	✓	✓	✓	✓	✓	✓
Size × Year	✓	✓	✓	✓	✓	✓
Balance sheet controls × Year	✓	✓	✓	✓	✓	✓
Observations	25,174	24,384	24,950	25,174	24,384	24,950

[Back]

[Back to Appendix Outline]

Robustness: Distribution of β and t-stat in Custom Data

- Remove products one by one (hs-3 digit) = 173 separate regressions: Distribution of β

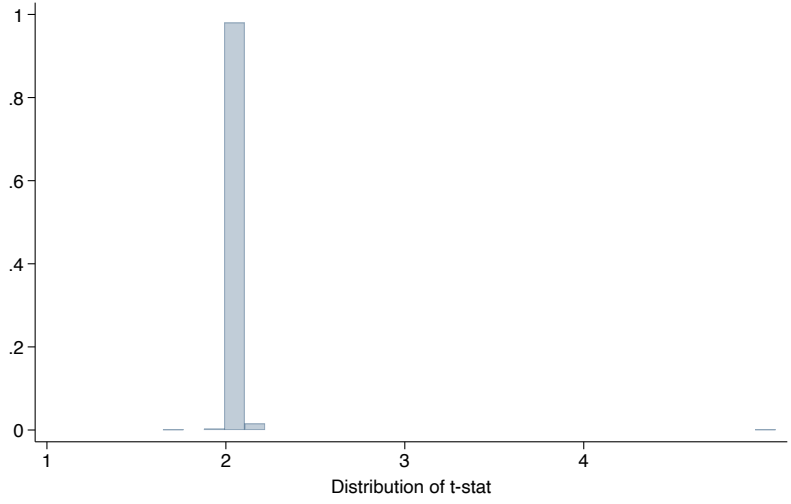


[Back]

[Back to Appendix Outline]

Robustness: Distribution of β and t-stat in Custom Data

- Remove products one by one (hs-3 digit) = 173 separate regressions: Distribution of t-stat

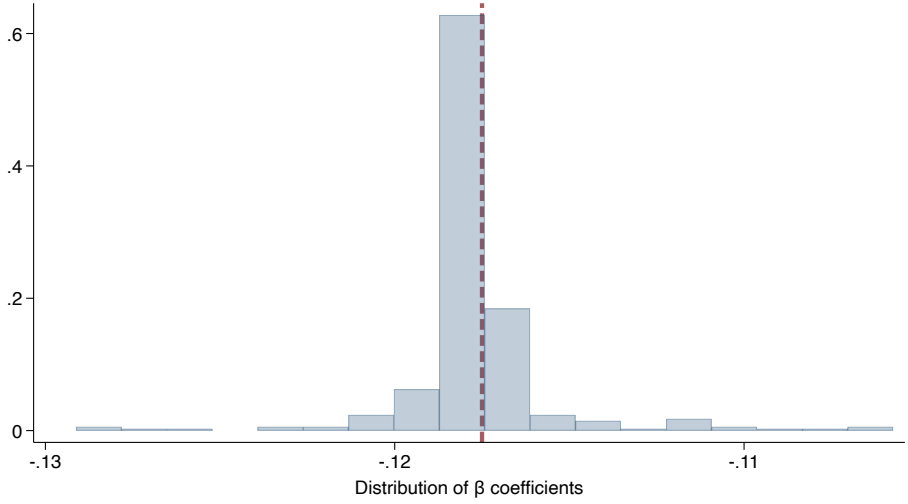


[Back]

[Back to Appendix Outline]

Robustness: Distribution of β and t-stat for Firms

- Remove industry one by one (sic-4 digit) = 336 separate regressions: Distribution of β

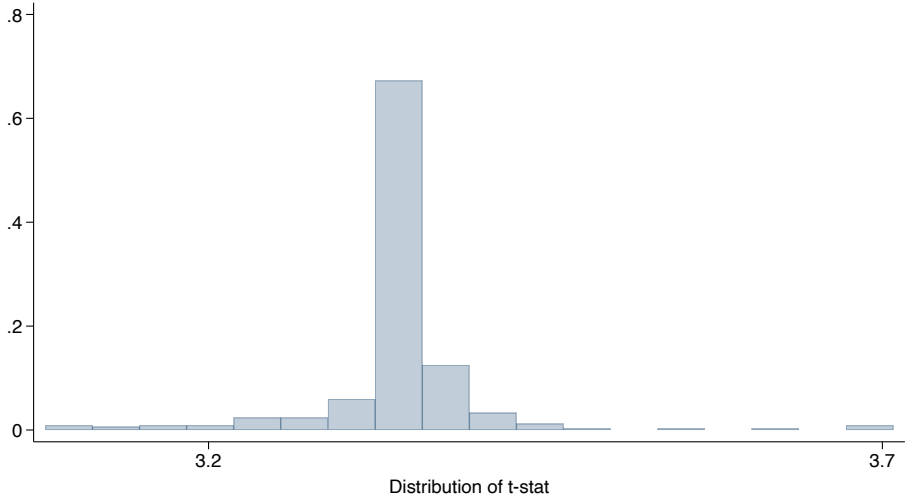


[Back]

[Back to Appendix Outline]

Robustness: Distribution of β and t-stat for Firms

- Remove industry one by one (sic-4 digit) = 336 separate regressions: Distribution of t-stat



[Back]

[Back to Appendix Outline]

Robustness: Different Industry Levels

Dependent variable	Total revenues			
	(1)	(2)	(3)	(4)
$EXIM_i \times Post_t$	-0.14	-0.12	-0.11	-0.13
	(0.034)	(0.035)	(0.033)	(0.047)
	[0.000023]	[0.00037]	[0.00054]	[0.0052]
Fixed Effects				
Exporter × Year	✓	✓	✓	✓
Industry (1-digit) × Year	✓	–	–	–
Industry (2-digit) × Year	–	✓	–	–
Industry (3-digit) × Year	–	–	✓	–
Industry (4-digit) × Year	–	–	–	✓
Observations	25,109	25,109	25,109	25,109

[Back]

[Back to Appendix Outline]

Different Winsor and Construction for LHS

Dependent variable	Revenues	Tangible capital	Intangible capital	Employment	Net profit margin
	(1)	(2)	(3)	(4)	(5)
			LHS: winsor 1%		
$EXIM_i \times Post_t$	-0.16	-0.19	-0.29	-0.12	-0.0085
	(0.044)	(0.060)	(0.069)	(0.040)	(0.0089)
	[0.00017]	[0.0015]	[0.000026]	[0.0032]	[0.34]
			LHS: winsor 4× interquartile		
$EXIM_i \times Post_t$	-0.12	-0.13	-0.17	-0.098	-0.0076
	(0.034)	(0.044)	(0.044)	(0.035)	(0.0069)
	[0.00045]	[0.0041]	[0.00016]	[0.0049]	[0.27]
			LHS: midpoint growth		
$EXIM_i \times Post_t$	-0.081	-0.096	-0.11	-0.10	-0.0066
	(0.031)	(0.037)	(0.036)	(0.038)	(0.0078)
	[0.010]	[0.0094]	[0.0023]	[0.0062]	[0.40]

[Back]

[Back to Appendix Outline]

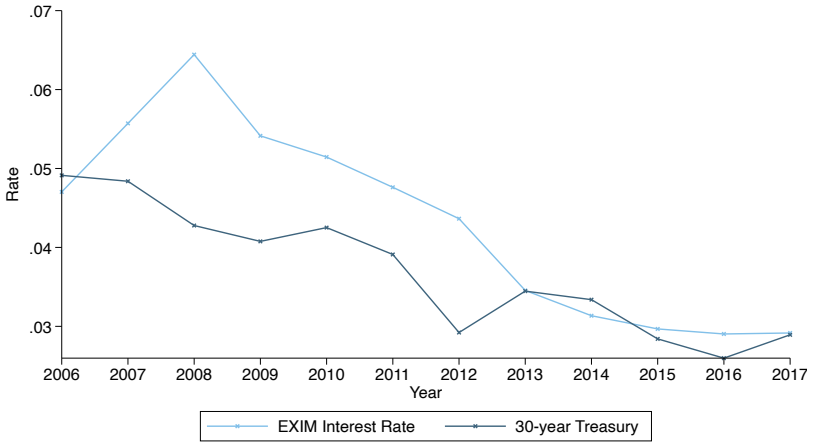
Robustness: Different Winsorizing

Dependent variable	Total revenues					
Winsorization	1%	2%	3%	4%	5%	10%
	(1)	(2)	(3)	(4)	(5)	(6)
EXIM × Post	-0.24***	-0.20***	-0.19***	-0.18***	-0.18***	-0.15***
	(0.067)	(0.048)	(0.043)	(0.040)	(0.037)	(0.027)
Fixed Effects						
Firm	✓	✓	✓	✓	✓	✓
Industry × Year	✓	✓	✓	✓	✓	✓
Destinations × Year	✓	✓	✓	✓	✓	✓
Observations	28,386	28,386	28,386	28,386	28,386	28,386

[Back]

[Back to Appendix Outline]

Interest Expense



EXIM Interest Rate is defined as a Loan Interest Expense on U.S. Treasury Borrowings (EXIM annual Statement of Net Costs) divided by the Intragovernmental Borrowings from and Amounts Payable to the U.S. Treasury (EXIM annual balance sheets).

[Back]

[Back to Appendix Outline]

Firm Financing Friction (λ_i) Heterogeneity

Proxies: Leverage (e.g., Giroud and Mueller, 2016; Giroud and Mueller, 2019); Dividends (dividends / EBITDA) (e.g., Fazzari, Hubbard and Petersen, 1988)); Financing frictions mentioned in 10-K (Hoberg and Maksimovic, 2015); Current liability/EBITDA (coverage ratio)

Dependent variable	Investment				
Financing frictions proxy:		Leverage	Dividends intensity	Hoberg and Maskimovic (2015)	Coverage ratio
	(1)	(2)	(3)	(4)	(5)
$EXIM_i \times \text{Post}_t \times I_i^{\text{Constrained}}$	-0.16***	-0.11***	-0.12***	-0.075**	
	(0.044)	(0.039)	(0.047)	(0.039)	
Fixed Effects (interacted)					
Exporter × Year	✓	✓	✓	✓	
Industry × Year	✓	✓	✓	✓	
Observations	23,985	23,942	22,285	24,626	

[Back]

[Back to Appendix Outline]

Destination Country (τ_m) Heterogeneity

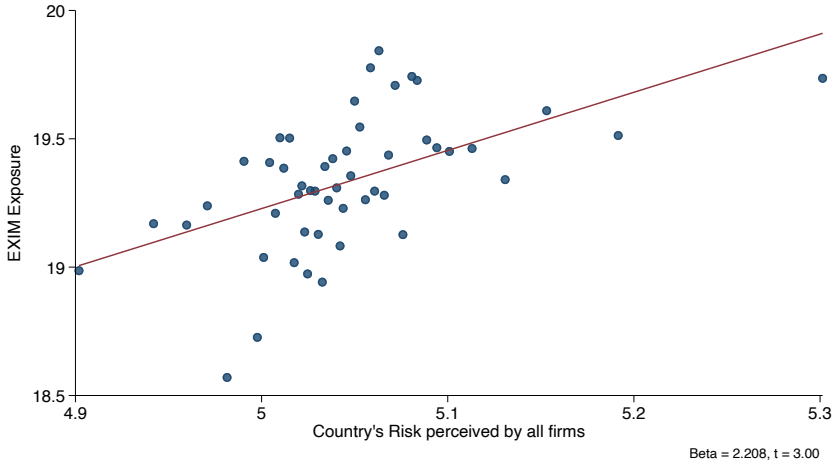
Dependent variable	Export				
Market frictions proxy:	Risk perception			Rule of	Financial
	Any	Financial	Foreign	law	development
	(1)	(2)	(3)	(4)	(5)
$EXIM_{p,o} \times Post_t \times I_d^{Constrained}$	-2.08**	-3.14***	-2.28**	-2.44***	-2.38***
	(0.98)	(1.22)	(1.08)	(0.99)	(0.99)
Fixed Effects					
Product (6-digit) × Destination × Year	✓	✓	✓	✓	✓
Origin × Year × $I_d^{Constrained}$	✓	✓	✓	✓	✓
$EXIM_{p,o} \times Post_t$	✓	✓	✓	✓	✓
Observations	1,661,218	1,661,218	1,661,218	3,341,610	3,255,834

[Back]

[Back to Appendix Outline]

Destination Country (τ_m) Heterogeneity in EXIM Financing

EXIM financing strongly correlated with the riskiness of a destination country



Hassan et al (2023) annual measures of country risk perceived by any firm

[Back to Appendix Outline]

Destination Country (τ_m) Heterogeneity in EXIM Financing

EXIM Exposure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk (by all)	2.265***	2.208***						
	(0.743)	(0.739)						
Risk (by financial)			1.702**	2.027***				
			(0.642)	(0.607)				
Risk (by foreign)					1.570*	1.433*		
					(0.888)	(0.810)		
Risk (by domestic)							-0.005	0.041
							(0.083)	(0.077)
Controls	–	✓	–	✓	–	✓	–	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	822	795	822	795	822	795	668	651

Hassan et al (2023) annual measures of country risk perceived by any firm; SEs clustered by country

[Back]

[Back to Appendix Outline]

Destination Country (τ_m) Heterogeneity in EXIM Financing

EXIM Exposure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk (by all)	2.265***	2.208***						
	(0.743)	(0.739)						
Risk (by financial)			1.702**	2.027***				
			(0.642)	(0.607)				
Risk (by foreign)					1.570*	1.433*		
					(0.888)	(0.810)		
Risk (by domestic)							-0.005	0.041
							(0.083)	(0.077)
Controls	–	✓	–	✓	–	✓	–	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	822	795	822	795	822	795	668	651

Hassan et al (2023) annual measures of country risk perceived by any firm; SEs clustered by country

[Back]

[Back to Appendix Outline]

Destination Country (τ_m) Heterogeneity in EXIM Financing

EXIM Exposure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk (by all)	2.265***	2.208***						
	(0.743)	(0.739)						
Risk (by financial)			1.702**	2.027***				
			(0.642)	(0.607)				
Risk (by foreign)					1.570*	1.433*		
					(0.888)	(0.810)		
Risk (by domestic)							-0.005	0.041
							(0.083)	(0.077)
Controls	–	✓	–	✓	–	✓	–	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	822	795	822	795	822	795	668	651

Hassan et al (2023) annual measures of country risk perceived by any firm; SEs clustered by country

[Back]

[Back to Appendix Outline]

Destination Country (τ_m) Heterogeneity in EXIM Financing

EXIM Exposure

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Risk (by all)	2.265***	2.208***						
	(0.743)	(0.739)						
Risk (by financial)			1.702**	2.027***				
			(0.642)	(0.607)				
Risk (by foreign)					1.570*	1.433*		
					(0.888)	(0.810)		
Risk (by domestic)							-0.005	0.041
							(0.083)	(0.077)
Controls	–	✓	–	✓	–	✓	–	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
Year FE	✓	✓	✓	✓	✓	✓	✓	✓
Observations	822	795	822	795	822	795	668	651

Hassan et al (2023) annual measures of country risk perceived by any firm; SEs clustered by country

[Back]

[Back to Appendix Outline]

EXIM Budget Allocation Process

- *Congressional Budget Justification* submitted at the beginning of each fiscal year:
  - Key Costs: Administration, Programs, Defaults/Losses
  - Additional Costs: Cybersecurity, SMEs, MWOBs Support
- EXIM's Self-Financing:
  - Used directly to offset operating expenses and program budget
  - Sent to Treasury to offset the U.S. budget deficit at the end of each fiscal year

[Back]

[Back to Appendix Outline]