Firm-Level Effects of Sanctions

Julian Hinz

Selected presentation for the International Agricultural Trade Research Consortium's (IATRC's) 2023 Annual Meeting: The Future of (Ag-) Trade and Trade Governance in Times of Economic Sanctions and Declining Multilateralism, December 10-12, 2023, Clearwater Beach, FL.

Firm-level effects of sanctions

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December 11, 2023 — IATRC Annual Meeting

Bloomberg

Politics

Treasury Targets Central Bank Leader in New Myanmar Sanctions

By Saleha Mohsin
17 May 2021, 16:30 CEST

The New York Times

Changing Tack, U.S. Sanctions Ethiopia Over Abuses in Tigray War

The measures signal a tougher American approach to a war in which Ethiopian forces are accused of atrocities. Ethiopia accused the U.S. of "meddling."

REUTERS®

June 1, 2021
4:51 PM CEST

Europe

EXCLUSIVE EU to blacklist Belarus airline ahead of economic sanctions, diplomats say

3 minute read

Robin Emmott

The Guardian

Switzerland

Switzerland adopts wholesale EU sanctions against Russia

Measures do not undermine neutrality principle as Switzerland says it is acting in defence of international law

SANCTIONS LITERATURE

- Growing literature on firms, consumers, political economy, . . .
- A lot more on effects in sanctioning countries than sanctioned countries

$\rightarrow$ data issues

- This talk: Recent research on firm-level effects of sanctions

EPISODES STUDIED IN THE LITERATURE

- 2012 Iran sanctions
- 2014 Russia sanctions
- 2022 Russia sanctions
- Myanmar, Cuba, Russian embargo of Turkish agricultural products, . . .

MAIN TAKE-AWAYS

- Significant costs for firms in sanctioning countries: Policy trade off
- Lasting effect of sanctions, especially for firms in sanctioned countries
- and plenty of unintended consequences

ROADMAP

1. Effects in sanctioning countries
   - Trade — Extensive margin
   - Trade — Intensive margin
   - Financial flows and stock market performance
   - Other papers
2. Effects in sanctioned countries
   - Trade — Imposing and lifting sanctions
   - Smart sanctions
   - Other papers
3. Take-aways

Effects in sanctioning countries

EFFECTS IN SANCTIONING COUNTRIES

- Why should sanctions have effects in sanctioning countries?
- Prior economic dependence “weaponized” for political objectives

→ Own firms and consumers affected

→ Higher cost of alternatives, fewer varieties

EFFECTS IN SANCTIONING COUNTRIES

- Extensive margin of trade: Firm exit and entry

→ Crozet et al. (2021)

- Intensive margin of trade: Effect on value traded

→ Crozet and Hinz (2020)

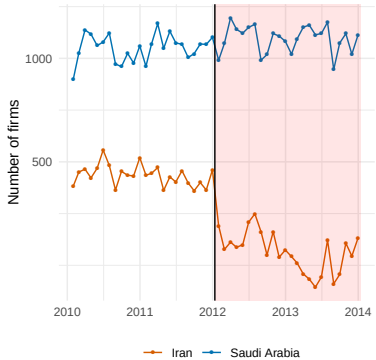
- Financial flows

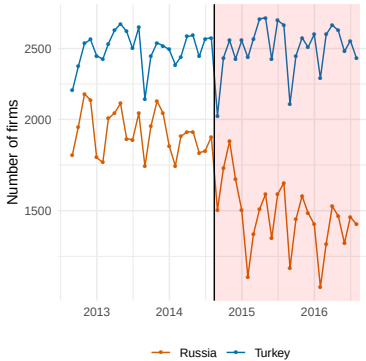
→ Nitsch et al. (2020)

- Firm performance on stock market

→ Leromain and Biermann (2023)

EXTENSIVE MARGIN: IMPOSING SANCTIONS

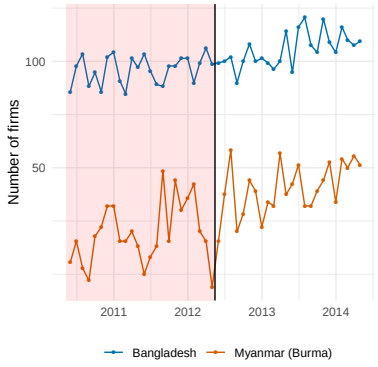


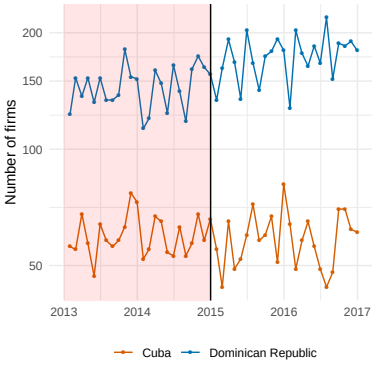


→ Iran: Average number of French exporting firms dropped by 40 %

→ Russia: 23 % fewer French exporters

EXTENSIVE MARGIN: LIFTING SANCTIONS





→ Myanmar: Number of French exporters gradually increased by a third

→ Cuba: Essentially no change in the number of exporting firms from France

CROZET ET AL. (2021)

- Which firms are likely to export to a country despite imposed sanctions?
- How important is prior experience in the sanctioned market?
- What characteristics are associated with staying in the market?

CROZET ET AL. (2021)

- Which firms are likely to export to a country despite imposed sanctions?
- How important is prior experience in the sanctioned market?
- What characteristics are associated with staying in the market?

→ Study sanctions against Iran, Russia, Myanmar and Cuba with French firm-level data

→ Simple dynamic model of extensive margin of trade

→ Estimation of two / three-way fixed effect Probit model with bias correction

ESTIMATED SPECIFICATIONS

- Baseline: Overall effect of sanctions

$$y_{\omega jt} = \mathbf{1}\left[\lambda_{\omega t} + \alpha\widehat{\psi}_{jt} + \mu_{\omega j} + \gamma y^{max}_{\omega j(t-12)} + \beta SANCT_{jt} \geq \zeta_{\omega jt}\right]$$

$\rightarrow$ Two-way with estimated fixed effects from *intensive* margin

ESTIMATED SPECIFICATIONS

- Baseline: Overall effect of sanctions

$$y_{\omega jt} = \mathbf{1}\left[\lambda_{\omega t} + \alpha\widehat{\psi}_{jt} + \mu_{\omega j} + \gamma y^{max}_{\omega j(t-12)} + \beta SANCT_{jt} \geq \zeta_{\omega jt}\right]$$

  $\rightarrow$ Two-way with estimated fixed effects from *intensive* margin

- Interaction of lag with sanctions indicators: Entry cost effect

$$y_{\omega jt} = \mathbf{1}\left[\lambda_{\omega t} + \psi_{jt} + \mu_{\omega j} + y^{max}_{\omega j(t-12)}\left(\gamma_0 + \gamma_1 SC_j + \gamma_2 SP_t + \gamma_3 SANCT_{jt}\right) \geq \zeta_{\omega jt}\right]$$

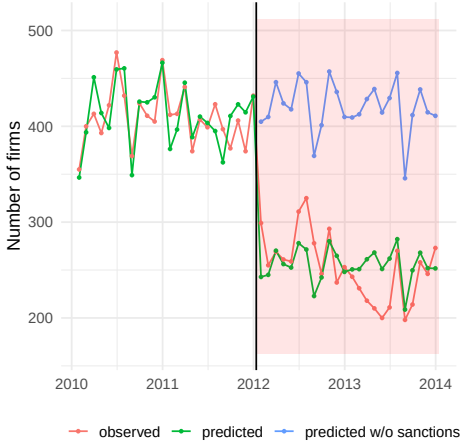
- Interaction with firm characteristics: Heterogeneity in trade cost effect

$$y_{\omega jt} = \mathbf{1}\left[\lambda_{\omega t} + \psi_{jt} + \mu_{\omega j} + \gamma y^{max}_{\omega j(t-12)} + SANCT_{jt}\left(\beta_2 x_{\omega}\right) \geq \zeta_{\omega jt}\right]$$

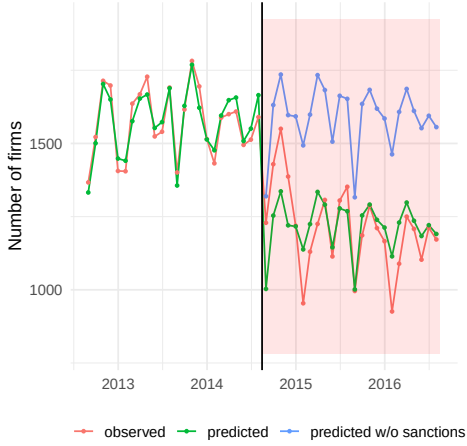
DATA

- French customs data: Universe of French exporting firms
- Monthly data from 2009 to 2016
- Around 150.000 firms exporting to more than 200 destinations

OVERALL EFFECT



(a) Iran sanctions



(b) Russia sanctions

HETEROGENEITY

- Previous experience in the sanctioned market considerably softens the blow
- Trade finance intensity important on extensive margin too
- Suggestive evidence for sanctions circumvention via neighboring countries
- Sanctions impact heterogeneous across episode, lifting not symmetric

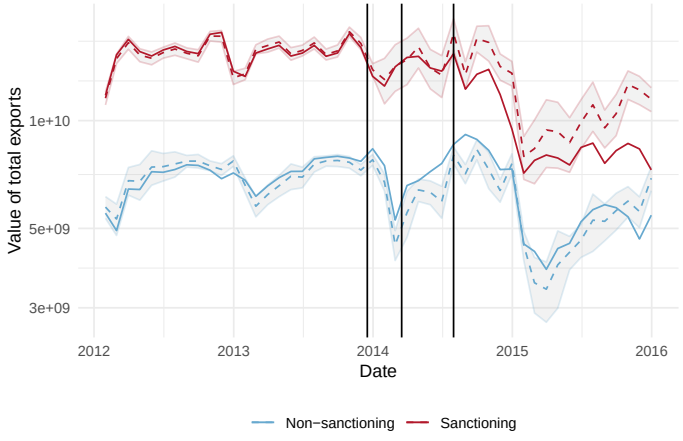
INTENSIVE MARGIN OF TRADE

- What happens to firms that stay in the market?

→ Tend to export less, mechanisms unclear

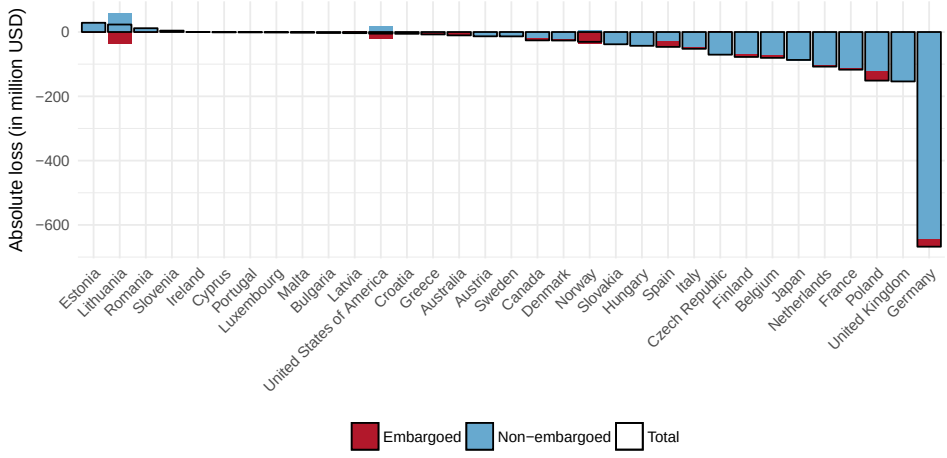
- "First" firm-level study: Crozet and Hinz (2020) on French firms in 2014 Russia sanctions

PREDICTED AND OBSERVED EXPORT VALUES



QUANTIFICATION OF “LOST TRADE”

Figure: Average Monthly export loss ($ Millions)



FIRM-LEVEL ANALYSIS

- Effect of embargo no surprise, what drives effect of non-embargoed goods?

→ Evidence from monthly French firm-level customs declarations

- We estimate the following difference-in-difference specifications:

$$x_{idkt} = \exp\left(\theta_{idk} + \theta_{itk} + \alpha' \hat{\Theta}_{dt} + \sum_{p=1,2,3} \delta_p \text{Event}_p \times (d = \text{Russia}) + \varepsilon_{idkt}\right),$$

CHANNELS OF TRADE DISRUPTION

- Difficulty to determine nature of trade impediments
- But: Indirect evidence by looking at heterogeneous impact across firms and products
- Two possible channels:

1. Change in consumer preferences ($\simeq$ boycott)
2. Rise of country risk: Disruption of the financing of trade

TRADE FINANCE

Sample	(1) Products	(2) Firms
$\Gamma \times$ Sep '13 - Nov '13	-0.005	-0.049
$\times$ LC share	(0.018)	(0.035)
$\Gamma \times$ Dec '13 - Feb '14	-0.059^{c}	-0.089^{b}
$\times$ LC share	(0.035)	(0.041)
$\Gamma \times$ Mar '14 - Jul '14	0.017	-0.092^{b}
$\times$ LC share	(0.021)	(0.037)
$\Gamma \times$ Aug '14 - Dec '14	-0.051^{a}	-0.147^{b}
$\times$ LC share	(0.018)	(0.061)
Fixed effects	okt, dkt, odkm	ikt, dkt, idkm
Sample size	101260881	1831356

Significance levels: ^{a}: p$<$0.01; ^{b}: p$<$0.05; ^{c}: p$<$0.1.

FINANCIAL FLOWS: BESEDES ET AL. (2021)

- Response of German non-financial entities to imposition of sanctions

→ highly disaggregated, monthly data from the German balance of payments statistics

- Financial activities with sanctioned countries are reduced
- Firms dealing with sanctioned countries tend to be disproportionately large
- Affected firms expand their activities with non-sanctioned countries, some with close trade ties
- No effect on firm performance such as employment or total sales

STOCK MARKET: LEROMAIN & BIERMANN (2023)

- Event study around the Russian invasion of Ukraine on stock performance
- Firms with significant trade activity with Russia experienced a substantial reduction in cumulative returns
- Effect on cumulative returns most pronounced for firms that are dependent on Russian commodities
- Aggregate stock market performance of sanctioning countries was on average 0.8 percentage points
- Highest losses were borne by European countries.

FURTHER RESEARCH

Trade effects: Country case studies

- Görg et al. (2023): Germany
- Jäkel et al. (2023): Denmark
- Fransen et al. (2023): Netherlands

Self sanctions

- Hart et al. (2023): Survey on firms pulling out of Russia in 2022

$\rightarrow$ consumers most powerful force to control the “morality” of firms

Indirect effects

- Crozet and Hinz (2023): Impact on elections

Effects in sanctioned countries

EFFECTS IN SANCTIONED COUNTRIES

- Firm-level effects: Imposing and lifting sanctions

→ Aytun, Hinz, and Özgüzel (2023)

- Unintended effects of smart sanctions

→ Nigmatulina (2023)

TRADE IMPACT: AYTUN, HINZ & ÖZGÜZEL (2023)

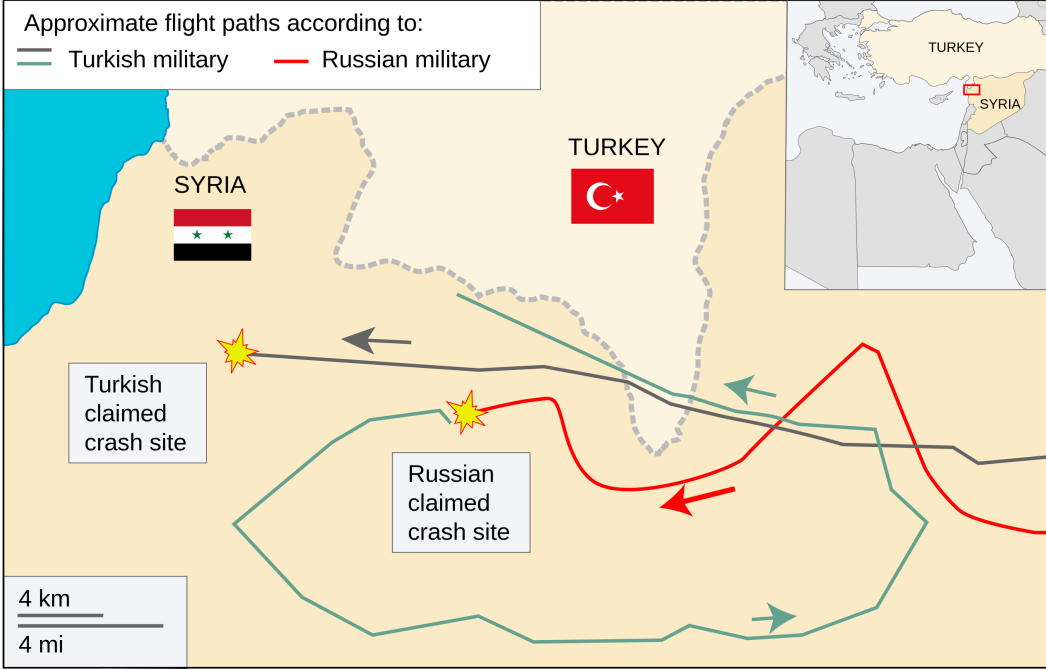
- Do sanctions actually matter for the affected firms?
- Estimate firm-level trade effects of the embargo

→ old story, novel estimation: combination of firm- and country-level data

- Estimate other firm-level economic outcomes

→ total sales, employment, . . .


ВВС РОССИИ
83


Approximate flight paths according to:
Turkish military
Russian military
SYRIA
TURKEY
TURKEY
SYRIA
Turkish claimed crash site
Russian claimed crash site
4 km
4 mi

AFTERMATH

- Putin: “The loss today is a stab in the back, carried out by the accomplices of terrorists. I can’t describe it in any other way.”
- Lavrov cancels planned visit to Turkey
- Russia imposes range of measures, including very specific product-level import embargo as of Jan 1, 2016

→ 17 products, different time horizons between 2015 and 2017

EMPIRICAL SETUP

- Imposition period, lifting period
- Embargo, diversion, circumvention
- 17 products, different times of lifting
- Turkish firm-level customs data, UN Comtrade product-level data
- Intensive and extensive margin estimations

GRAVITY SETUP

Gravity combined for firm-level (i) and country-level (o)

$$X_{\{i,o\}dkt} = \exp\left(\Gamma_{\{i,o\}kt} + \Gamma_{dkt} + \Gamma_{\{i,o\}dk} + \delta_k S_{odkt}\right) \tag{1}$$

- Fixed effects: Origin $\times$ product $\times$ time, destination $\times$ product $\times$ time, origin $\times$ destination $\times$ product $\times$ month
- Estimate with PPML

	Two-way	Two-way with est. FE	Three-way	Three-way with global data
Embargo x period imposition	-14.36***			
	(0.6491)			
Embargo x period lifting	-0.7000***			
	(0.0837)			
Diversion x period imposition	0.0831			
	(0.0529)			
Diversion x period lifting	-0.2351***			
	(0.0567)			
Circumvention x period imposition	-0.4435***			
	(0.0520)			
Circumvention x period lifting	-0.2090***			
	(0.0537)			
Est. destination × product × time FE				
Observations	1,185,212	1,114,179	1,179,861	13,085,742
Origin × product × time FE	yes	yes	yes	yes
Origin × destination × product × month FE	yes	yes	yes	yes
Destination × time FE	no	no	yes	no
Destination × product × time FE	no	no	no	yes

	Two-way	Two-way with est. FE	Three-way	Three-way with global data
Embargo x period imposition	-14.36***	-12.93***		
	(0.6491)	(0.7108)		
Embargo x period lifting	-0.7000***	-0.1752**		
	(0.0837)	(0.0672)		
Diversion x period imposition	0.0831	0.1729***		
	(0.0529)	(0.0478)		
Diversion x period lifting	-0.2351***	-0.0488		
	(0.0567)	(0.0450)		
Circumvention x period imposition	-0.4435***	-0.4077***		
	(0.0520)	(0.0471)		
Circumvention x period lifting	-0.2090***	-0.1058*		
	(0.0537)	(0.0476)		
Est. destination × product × time FE		0.8567***		
		(0.0161)		
Observations	1,185,212	1,114,179	1,179,861	13,085,742
Origin × product × time FE	yes	yes	yes	yes
Origin × destination × product × month FE	yes	yes	yes	yes
Destination × time FE	no	no	yes	no
Destination × product × time FE	no	no	no	yes

	Two-way	Two-way with est. FE	Three-way	Three-way with global data
Embargo x period imposition	-14.36***	-12.93***	-13.62***	
	(0.6491)	(0.7108)	(1.042)	
Embargo x period lifting	-0.7000***	-0.1752**	-0.1518	
	(0.0837)	(0.0672)	(0.0981)	
Diversion x period imposition	0.0831	0.1729***	0.0607	
	(0.0529)	(0.0478)	(0.0683)	
Diversion x period lifting	-0.2351***	-0.0488	-0.0977	
	(0.0567)	(0.0450)	(0.0653)	
Circumvention x period imposition	-0.4435***	-0.4077***	0.0813	
	(0.0520)	(0.0471)	(0.0832)	
Circumvention x period lifting	-0.2090***	-0.1058*	0.5076***	
	(0.0537)	(0.0476)	(0.0887)	
Est. destination × product × time FE		0.8567***		
		(0.0161)		
Observations	1,185,212	1,114,179	1,179,861	13,085,742
Origin × product × time FE	yes	yes	yes	yes
Origin × destination × product × month FE	yes	yes	yes	yes
Destination × time FE	no	no	yes	no
Destination × product × time FE	no	no	no	yes

	Two-way	Two-way with est. FE	Three-way	Three-way with global data
Embargo x period imposition	-14.36***	-12.93***	-13.62***	-13.05***
	(0.6491)	(0.7108)	(1.042)	(0.6618)
Embargo x period lifting	-0.7000***	-0.1752**	-0.1518	-0.2994**
	(0.0837)	(0.0672)	(0.0981)	(0.1024)
Diversion x period imposition	0.0831	0.1729***	0.0607	0.6815***
	(0.0529)	(0.0478)	(0.0683)	(0.0807)
Diversion x period lifting	-0.2351***	-0.0488	-0.0977	0.2474***
	(0.0567)	(0.0450)	(0.0653)	(0.0717)
Circumvention x period imposition	-0.4435***	-0.4077***	0.0813	-0.0090
	(0.0520)	(0.0471)	(0.0832)	(0.0982)
Circumvention x period lifting	-0.2090***	-0.1058*	0.5076***	0.1572
	(0.0537)	(0.0476)	(0.0887)	(0.1030)
Est. destination × product × time FE		0.8567***		
		(0.0161)		
Observations	1,185,212	1,114,179	1,179,861	13,085,742
Origin × product × time FE	yes	yes	yes	yes
Origin × destination × product × month FE	yes	yes	yes	yes
Destination × time FE	no	no	yes	no
Destination × product × time FE	no	no	no	yes

IMPACT BEYOND TRADE

- Do embargoes really matter economically?
- Firm-level indicators for activity
- Firm-to-firm domestic network from Central Bank data
- Monthly employment data at establishment level from Ministry of Economics

EMPIRICAL SETUP

Classic difference-in-differences setup

$$\log X_{it} = \Gamma_{im} + \Gamma_t + \delta S_{it} + \epsilon_{it}$$

- Firm $\times$ month and time fixed effect
- Treatment: Firm exported embargoed products to Russia before imposition
- Control group:
  - Firms exported embargoed products to other markets and
  - Firms exporting non-embargoed products to Russia

DOMESTIC SALES

Dependent Variables:	log(value)		
Model:	(1)	(2)	(3)
Embargo × period imposition	-0.1448***	-0.1288**	-0.1550***
	(0.0521)	(0.0553)	(0.0534)
Embargo × period lifting	-0.0653	-0.0704	-0.0715
	(0.0682)	(0.0698)	(0.0698)
Non-Russia × period imposition		0.0518	
		(0.0312)	
Non-Russia × period lifting		-0.0256	
		(0.0514)	
Non-embargo × period imposition			-0.0529
			(0.0455)
Non-embargo × period lifting			-0.0239
			(0.0597)
Observations	88,294	88,294	88,294
R^2	0.83888	0.83906	0.83889

NUMBER OF CUSTOMERS

Dependent Variables:	log(number of connections)		
Model:	(4)	(5)	(6)
Embargo × period imposition	-0.0496	-0.0526	-0.0554*
	(0.0308)	(0.0319)	(0.0314)
Embargo × period lifting	-0.0740*	-0.0786*	-0.0824*
	(0.0416)	(0.0423)	(0.0425)
Non-Russia × period imposition		0.0029	
		(0.0161)	
Non-Russia × period lifting		-0.0235	
		(0.0355)	
Non-embargo × period imposition			-0.0293
			(0.0327)
Non-embargo × period lifting			-0.0455
			(0.0395)
Observations	88,294	88,294	88,294
R^2	0.91997	0.92004	0.91999

EMPLOYMENT

Dependent Variable:	log(total workers)		
Model:	(1)	(2)	(3)
Embargo × period imposition	-0.1085**	-0.0989**	-0.1108**
	(0.0419)	(0.0425)	(0.0426)
Embargo × period lifting	-0.1161**	-0.1159**	-0.1132**
	(0.0498)	(0.0498)	(0.0510)
Non-Russia × period imposition		0.0522	
		(0.0460)	
Non-Russia × period lifting		0.0298	
		(0.0500)	
Non-embargo × period imposition			-0.0114
			(0.0486)
Non-embargo × period lifting			0.0230
			(0.0602)
Observations	88,553	88,553	88,553
R^2	0.92214	0.92216	0.92215

NIGMATULINA (2023): SANCTIONS AND MISALLOCATION

- "Smart Sanctions and Misallocation: How Sanctioned Firms Won and Russians Lost"
- Smart sanctions: aim to hurt the elites but not the average citizen

→ US today has over 70 countries under such sanctions (Felbermayr et al., 2020)

- little evidence on how targets respond and on collateral damage on the rest of the economy
- Sanctions target strategic, "important", often elite-owned firms

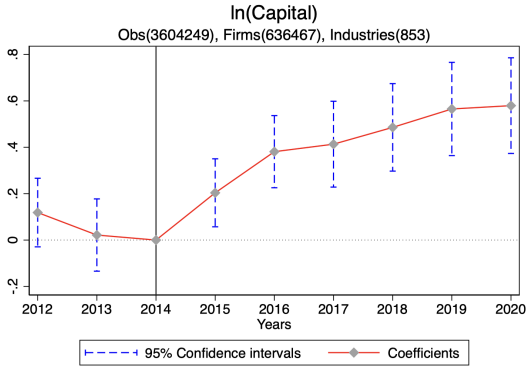
→ data on 600,000 Russian firm balance sheets between 2014-2020

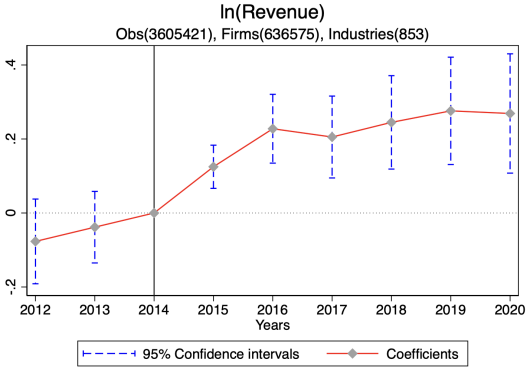
NIGMATULINA (2023): EXAMPLE CASE

2014: Arkady Rotenberg is sanctioned

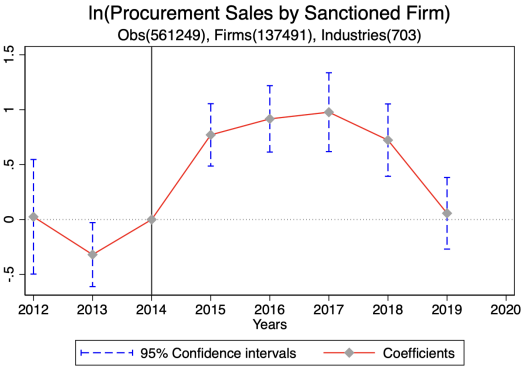
2015: Stroigazmontazh (owned by Rotenberg) wins the government contract of 223,1 bln roubles to build the bridge to Crimea

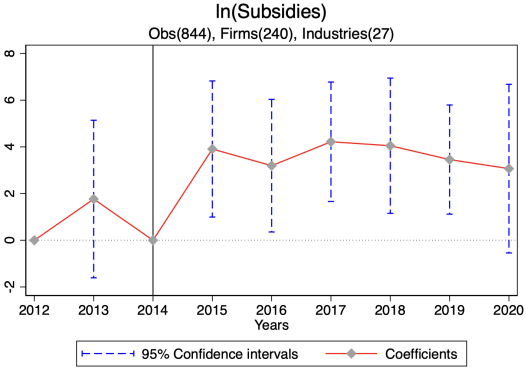
NIGMATULINA (2023): MISALLOCATION





NIGMATULINA (2023): MISALLOCATION





NIGMATULINA (2023): MISALLOCATION

- Allocation of resources worsened
- Subsidies and contracts were allocated at expense of rest

→ “Smart sanctions” led to nothing but collateral damage

→ Elites empowered rather than split

FURTHER RESEARCH

Firms in targeted economies

- Ahn & Ludema (2020): Russian firm performance
- Haidar (2017): Iran firm performance
- Draca et al. (2022): Iranian Regime-connect firms on stock market

Indirect effects in targeted economies

- Hinz and Monastyrenko (2022): Price shock for consumers
- Peeva (2023) and Gold et al. (2023): 2014 sanctions appear to have increased support for Putin

Effects in third countries: Sanctions busting

- Aytun, Hinz, and Özgüzel (2023): Turkish detour

Take-aways

TAKE-AWAYS

- Significant cost for firms in sanctioning countries

→ Direct and side effects, policy trade off

- Lasting effect of sanctions, especially for firms in sanctioned countries

→ Lifting sanctions not symmetric, space for new policy

- Plenty of unintended consequences

→ Strengthened sanctioned firms, “rally-around-the-flag”, . . .

Firm-level effects of sanctions

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