

The **Location** of Extractive FDI and Armed Conflicts

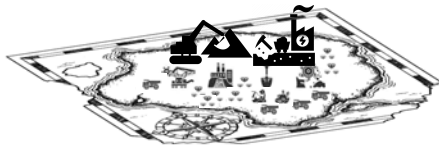
Gyu Sang Shim

University of Rochester

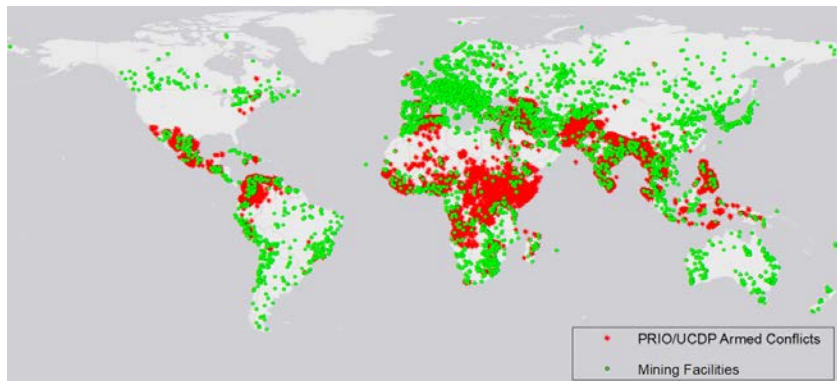
International Political Economy Society

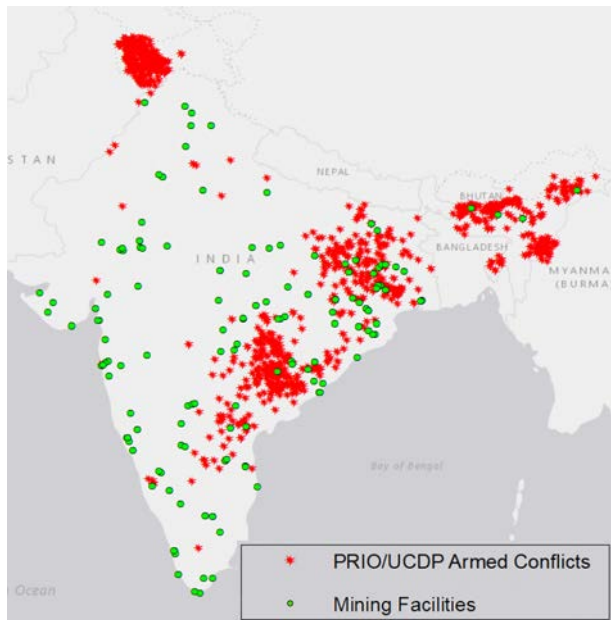
November 13, 2020

Extractive FDI



Extractive FDI





Lafarge Cement Factory, Syria (2007)



Lafarge Cement Factory, Syria (2013-2014)



Lafarge Cement Factory, Syria (2019)



Lafarge Cement Factory, Syria (2019)



Research Puzzle

- ▶ Negative Impact of Armed conflicts on FDI (e.g. Ghobarah 2003, Murdoch 2002)
- ▶ Mining industries enhance greed and grievance (e.g. Collier 1998, 2004, Holden&Jacobson 2007)
- ▶ Extractive FDI aggravates both greed and grievance (Mihalache 2018)
- ▶ Yet, counterintuitive to the presence of extractive FDI around the world

Research Question

- ▶ What determines the location of armed conflict?
- ▶ Do mines attract armed conflicts in regions where they are located?
- ▶ Do foreign-owned mines attract more armed conflicts than domestic mines?
- ▶ If foreign miners know that they are destined to face armed conflicts as a consequence of their investment, what drives their FDI decision?

Prevention Effect of Foreign Ownership

- ▶ Belligerents are not indifferent between domestic mines and foreign-owned mines.
- ▶ “Use of Military Force in the Protection of Nationals Abroad”
- ▶ Direct and Indirect Military Intervention in Conflicts
- ▶ Fear of Military Intervention (Insurgents)
+ Less Responsibility for Protection (Counter-insurgents)

⇒ Fewer armed conflicts near foreign-owned mines

Caño Limón Coveñas Oil Pipeline, Colombia



Caño Limón Coveñas Oil Pipeline, Colombia

- ▶ FARC and ELN since 1990s
- ▶ Occidental Petroleum spent \$8.6 million lobbying to the US between 1996-2000
- ▶ The US spent \$99 million military aids + Aid Program (Plan Colombia)

	2001	2002	2003	2004
Attacks	170	41	34	17

Hypotheses

H1 Regions where a foreign-owned mine is located are less likely to experience armed conflicts.

H2 Armed conflicts are less likely to occur in regions invested by foreign miners from countries with greater military capabilities.

Research Design

- ▶ Mineral operations outside the United States (USGS 2010)
- ▶ Geo-referenced facility level data
- ▶ 6,222 mining facilities in 148 countries (except the US) which started operation between 2003-2008

Research Design

- ▶ Difference-in-differences design
- ▶ Outcome variable: the number of armed conflicts (UCDP/PRIO GED 19.1) within 300 km
- ▶ Treatment variable: foreign ownership of a mine
- ▶ Intervention: each mine's starting year of operation

Model Specification

$$\begin{aligned} \text{Armed Conflicts}_{i,t} = & \beta_0 + \beta_1 \text{Foreign}_{i,t} + \beta_2 T_{i,t} + \beta_3 \text{Foreign}_{i,t} \times T_{i,t} \\ & + \beta_4 V_{c,t} + \beta_5 W_i + \beta_6 Z_{j,t} + \gamma_j + \delta_t + u_i \end{aligned} \quad (1)$$

- ▶ γ_j : host country FE
- ▶ δ_t : year FE
- ▶ $V_{c,t}$: logged unit price, and annual price growth rate
- ▶ W_i : the mean, minimum, maximum, and std. dev. of the ruggedness
- ▶ $Z_{j,t}$: past battles within 5 yrs, POLITY, GDPPC, GDPPC², GDPPC³, and the logged bilateral foreign aid
- ▶ Standard errors are clustered by facility (i).

<i>Original Sample Statistics</i>						
	Domestic Mines		Foreign-owned Mines		Difference	
	μ_0	n	μ_1	n	$\mu_1 - \mu_0$	t-stat
Armed Conflicts $_{i,t}$	5.579	28212	4.475	9120	-1.104	1.56
Logged Commodity Price $_{c,t-1}$	5.977	28212	6.333	9120	0.356***	2.87
Δ Commodity Price $_{c,t-1}$	10.119	28212	9.560	9120	-0.559*	1.86
Average Ruggedness $_i$	143.312	28212	113.191	9120	-30.121***	8.40
Minimum Ruggedness $_i$	0.643	28212	0.355	9120	-0.287***	3.96
Maximum Ruggedness $_i$	1519.780	28212	1400.814	9120	-118.967***	4.22
Std. Dev. Ruggedness $_i$	135.098	28212	108.830	9120	-26.268***	10.46
Past Battles within 5 Years $_{j,t}$	0.559	28212	0.480	9120	-0.080***	5.57
POLITY $_{j,t-1}$	4.341	28212	7.098	9120	2.757***	18.59
GDPPC $_{j,t-1}$	14832.97	28212	21268.06	9120	6435.097***	10.43
Logged Aid $_{j,t-1}$	15.013	28212	12.531	9120	-2.482***	9.66
<i>Sample Statistics Weighted by the Kernel-based Propensity Score</i>						
Armed Conflicts $_{i,t}$	4.280	28212	4.475	9120	0.195	0.30
Logged Commodity Price $_{,-1}$	6.255	28212	6.333	9120	0.077	0.58
Δ Commodity Price $_{,-1}$	9.806	28212	9.560	9120	-0.246	0.82
Average Ruggedness $_i$	116.831	28212	113.191	9120	-3.640	1.01
Minimum Ruggedness $_i$	0.395	28212	0.355	9120	-0.039	0.70
Maximum Ruggedness $_i$	1390.916	28212	1400.814	9120	9.898	0.32
Std. Dev. Ruggedness $_i$	111.049	28212	108.830	9120	-2.218	0.87
Past Battles within 5 Years $_{j,t}$	0.470	28212	0.480	9120	0.009	0.62
POLITY $_{j,t-1}$	7.052	28212	7.098	9120	0.046	0.35
GDPPC $_{j,t-1}$	20983	28212	21268.066	9120	-220.639	0.31
Logged Aid $_{j,t-1}$	12.453	28212	12.531	9120	0.078	0.28

Note: * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

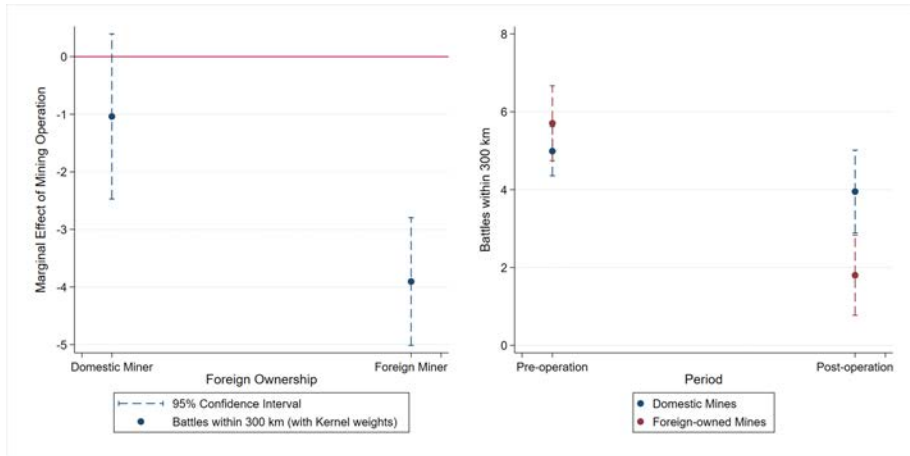
DID

	Model 1	Model 2
	Pre-matching	Post-matching
Foreign _{<i>i,t</i>}	0.795 (0.613)	0.717 (0.615)
<i>T</i> _{<i>i,t</i>}	-0.412 (0.587)	-1.039 (0.731)
Foreign _{<i>i,t</i>} × <i>T</i> _{<i>i,t</i>}	-4.031*** (0.931)	-2.866*** (0.813)
Constant	83.939*** (17.589)	56.453*** (13.765)
Observations	49,776	49,776
Adjusted <i>R</i> ²	0.40	0.39
Controls	Yes	Yes
Host Country FE	Yes	Yes
Year FE	Yes	Yes

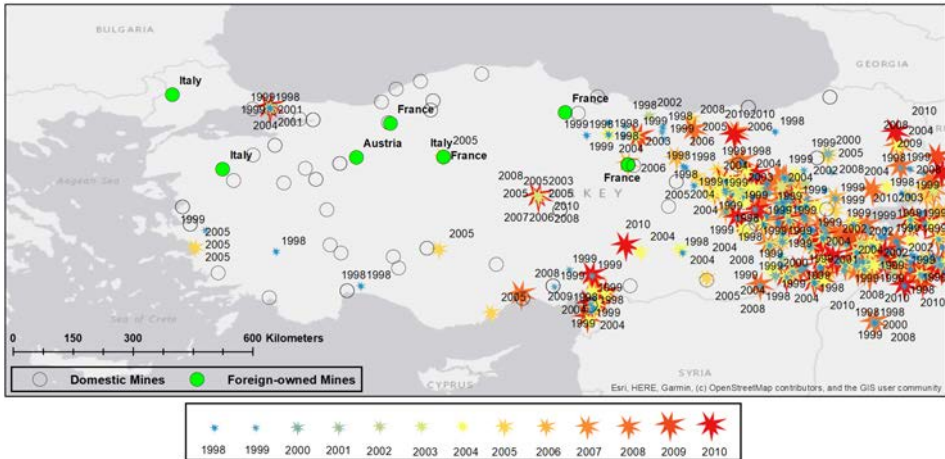
Note: Entries in parentheses are standard errors clustered by facility (*i*).

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The Effect of Foreign Ownership (Model 2)



The Prevention Effect of Extractive FDI in Turkey

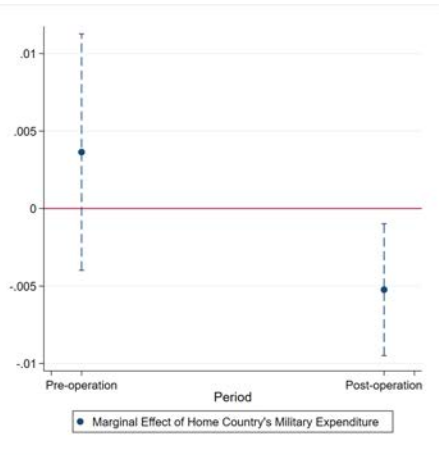
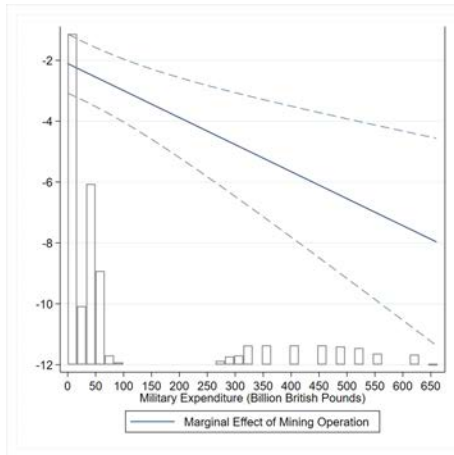


The Heterogeneous Effect of Foreign Ownership

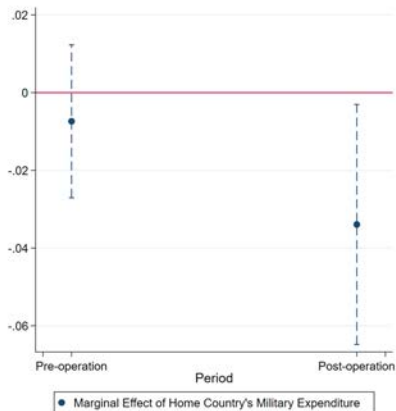
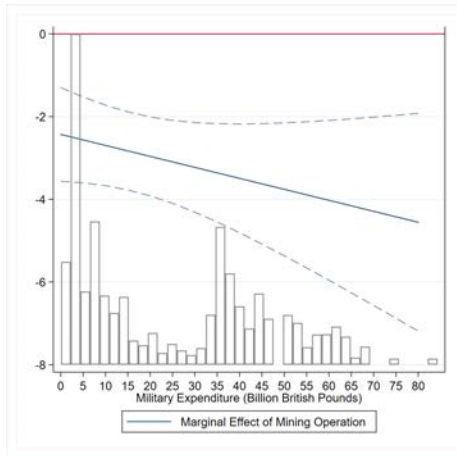
$$\begin{aligned} \text{Armed Conflicts}_{i,t} = & \beta_0 + \beta_1 \text{Mil. Exp.}_{i,t-1} + \beta_2 T_{i,t} + \beta_3 \text{Mil. Exp.}_{i,t-1} \times T_{i,t} \\ & + \beta_4 V_{c,t} + \beta_5 W_i + \beta_6 Z_{j,t} + \gamma_j + \delta_t + u_i \end{aligned} \quad (2)$$

$$\begin{aligned} \text{Armed Conflicts}_{i,t} = & \beta_0 + \beta_1 \text{Nationality}_{i,t} + \beta_2 T_{i,t} + \beta_3 \text{Nationality}_{i,t} \times T_{i,t} \\ & + \beta_4 V_{c,t} + \beta_5 W_i + \beta_6 Z_{j,t} + \gamma_j + \delta_t + u_i \end{aligned} \quad (3)$$

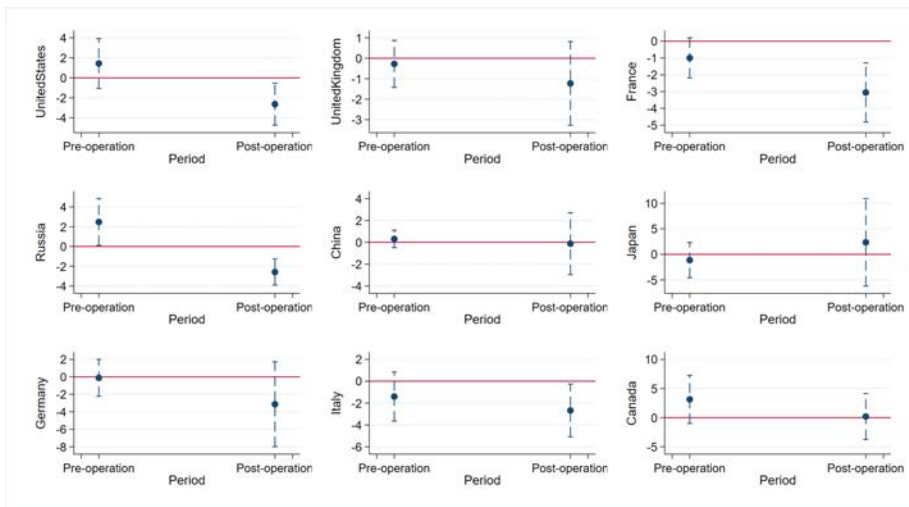
The Effect of Military Capability



The Effect of Military Capability (excluding US)



The Effect of Nationality



Alternative Explanation

- ▶ Bribery:
Appeasement vs. War Financing + Preventive Attack

- ▶ Mercenary:
Deterrence vs. Increased Grievances + Battles between security forces and insurgents

⇒ The net effect is unclear.

Testing Alternative Explanation

- ▶ Firm Size $\uparrow \Rightarrow$ Affordability of bribes and mercenaries \uparrow
- ▶ Measuring firm size with the number of foreign mines owned by foreign miners in t
- ▶ (1) Controlling Firm Size in Model 1 and 2;
(2) Analyzing foreign-owned mines subset with the interaction term between Firm Size and Intervention

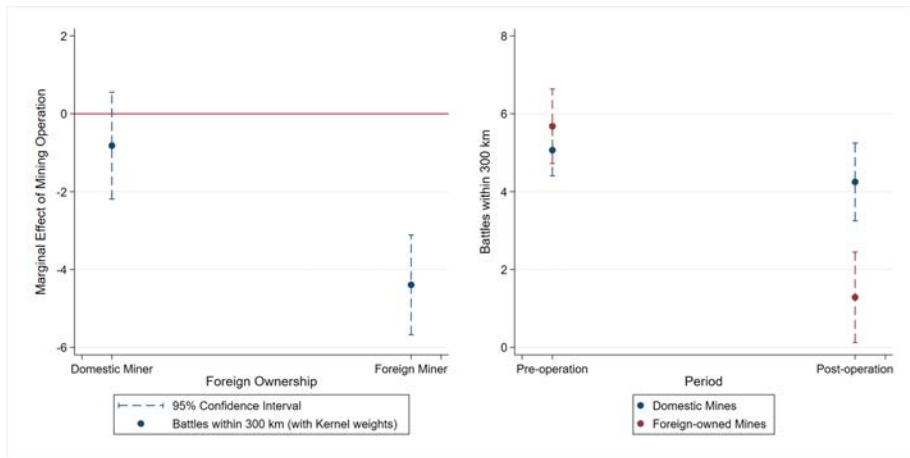
$$\text{Armed Conflicts}_{i,t} = \beta_0 + \beta_1 \text{ Firm Size}_{i,t} + \beta_2 T_{i,t} + \beta_3 \text{ Firm Size}_{i,t} \times T_{i,t} + \beta_4 V_{c,t} + \beta_5 W_i + \beta_6 Z_{j,t} + \gamma_j + \delta_t + u_i \quad (4)$$

	Model 6	Model 7	Model 8
	Pre-matching	Post-matching	Foreign-owned Mines
Foreign _{<i>i,t</i>}	0.668 (0.617)	0.612 (0.617)	
Firm Size _{<i>i,t</i>}	0.035 (0.026)	0.032 (0.026)	-0.005 (0.023)
<i>T</i> _{<i>i,t</i>}	-0.316 (0.581)	-0.817 (0.700)	-3.441*** (1.142)
Foreign _{<i>i,t</i>} × <i>T</i> _{<i>i,t</i>}	-4.739*** (0.926)	-3.576*** (0.812)	
Firm Size _{<i>i,t</i>} × <i>T</i> _{<i>i,t</i>}			0.039** (0.018)
Constant	83.492*** (17.585)	56.754*** (13.483)	12.207 (15.177)
Observations	49,776	49,776	12,160
Adjusted <i>R</i> ²	0.40	0.39	0.34
Controls	Yes	Yes	Yes
Host Country FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes

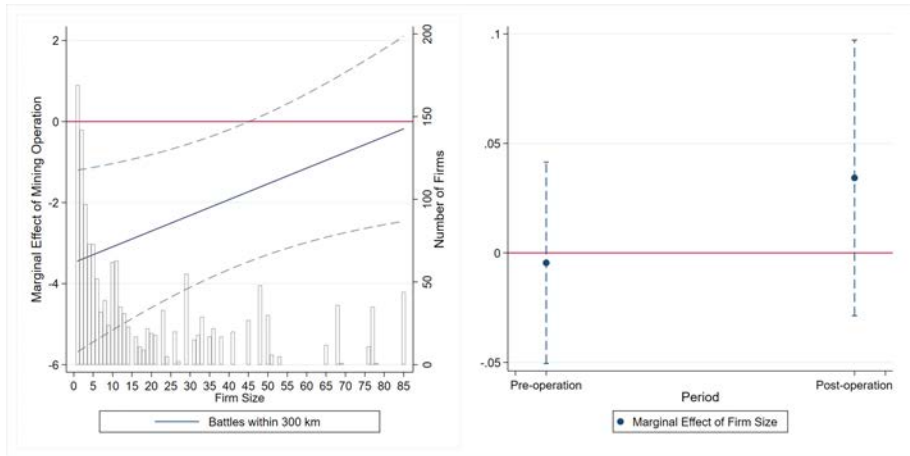
Note: Entries in parentheses are standard errors clustered by facility (*i*).

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The Effect of Foreign Ownership (Model 7)



The Effect of Firm Size (Model 8)

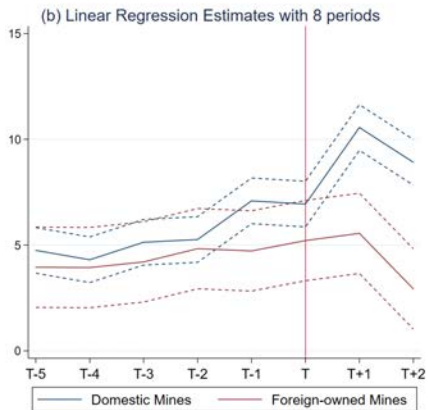
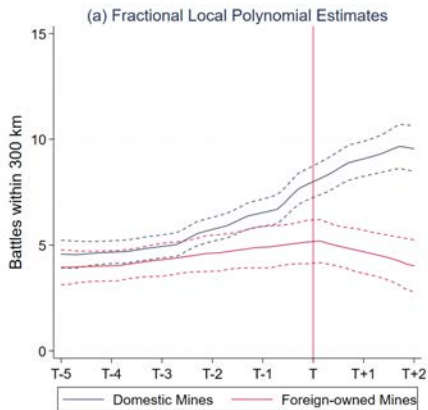


Conclusion

- ▶ Theory: how the location of extractive FDI shapes the geographical pattern of armed conflicts
- ▶ Data: the use of georeferenced mine-year level data
- ▶ Identification with DID and Kernel-based PS Matching Strategy
- ▶ Findings are robust across the different sizes of distance bands (100 km and 500 km) and casualty levels (more than 10 deaths and more than 20 deaths).

Thank You

Identification Strategy

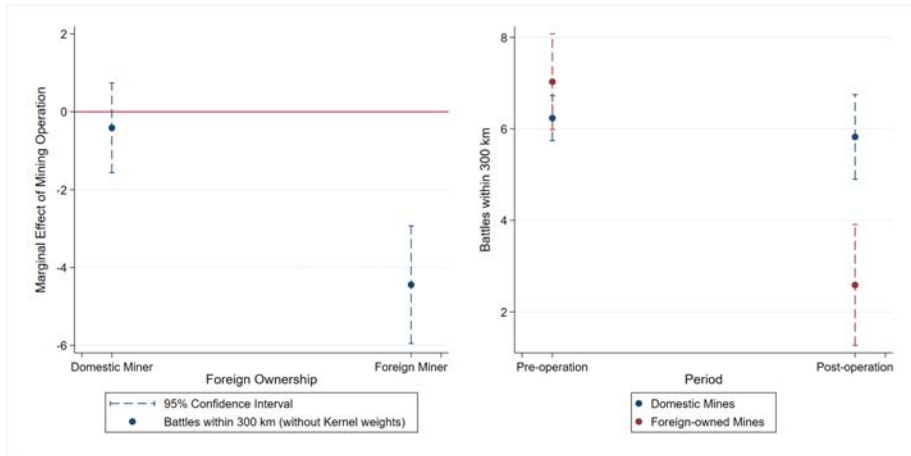


	Model 1	Model 2
	Pre-matching	Post-matching
Foreign _{<i>i,t</i>}	0.795 (0.613)	0.717 (0.615)
<i>T_{i,t}</i>	-0.412 (0.587)	-1.039 (0.731)
Foreign _{<i>i,t</i>} × <i>T_{i,t}</i>	-4.031*** (0.931)	-2.866*** (0.813)
Logged Commodity Price _{<i>c,t-1</i>}	-0.043 (0.033)	-0.084** (0.037)
Δ Commodity Price _{<i>c,t-1</i>}	-0.000 (0.004)	0.004 (0.004)
Average Ruggedness _{<i>i</i>}	0.004 (0.006)	0.004 (0.006)
Minimum Ruggedness _{<i>i</i>}	0.030 (0.053)	-0.180* (0.092)
Maximum Ruggedness _{<i>e</i>}	-0.001*** (0.000)	-0.001 (0.000)
Std. Dev. Ruggedness _{<i>i</i>}	0.025** (0.011)	0.007 (0.013)
Past Battles within 5 Years _{<i>j,t</i>}	-0.754*** (0.219)	-0.755*** (0.191)
POLITY _{<i>j,t-1</i>}	0.711 (0.458)	0.037 (0.217)
GDPPC _{<i>j,t-1</i>}	-0.003*** (0.000)	-0.002*** (0.000)
GDPPC ² _{<i>j,t-1</i>}	0.000*** (0.000)	0.000* (0.000)
GDPPC ³ _{<i>j,t-1</i>}	-0.000*** (0.000)	-0.000 (0.000)
Logged Aid _{<i>j,t-1</i>}	0.033*** (0.012)	0.056*** (0.010)
Constant	83.939*** (17.589)	56.453*** (13.765)
Observations	49776	49776
Adjusted <i>R</i> ²	0.40	0.39
Host Country FE	Yes	Yes
Year FE	Yes	Yes

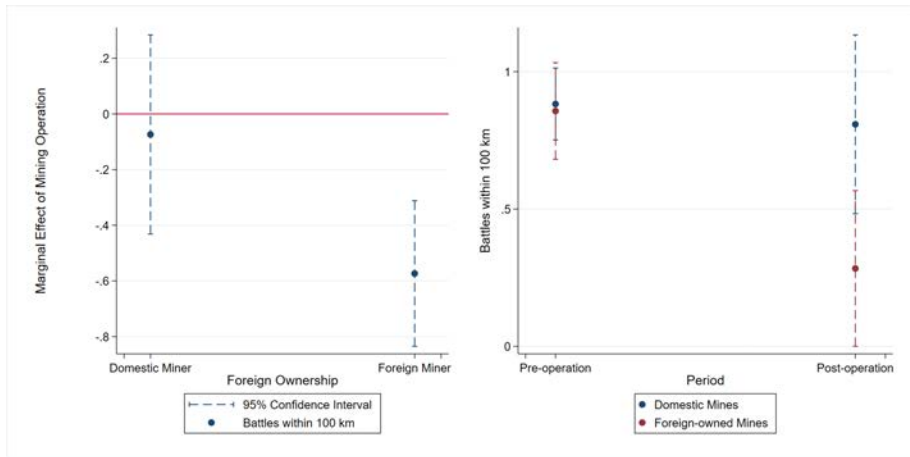
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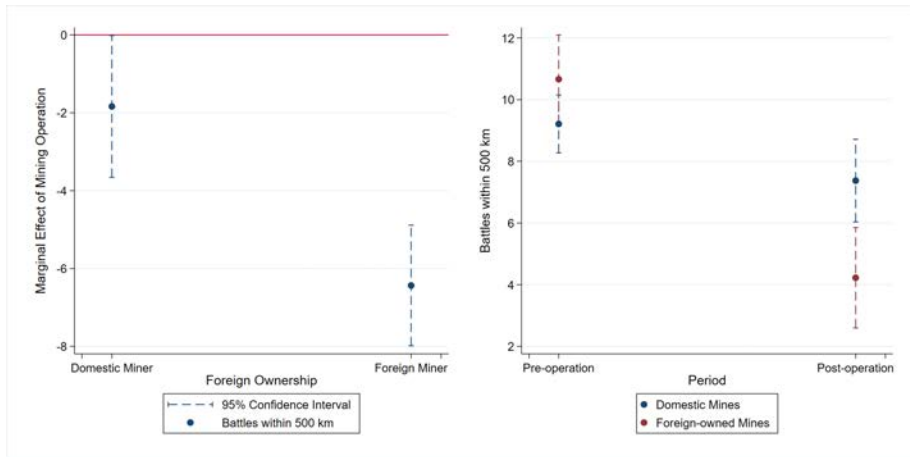
Model 1



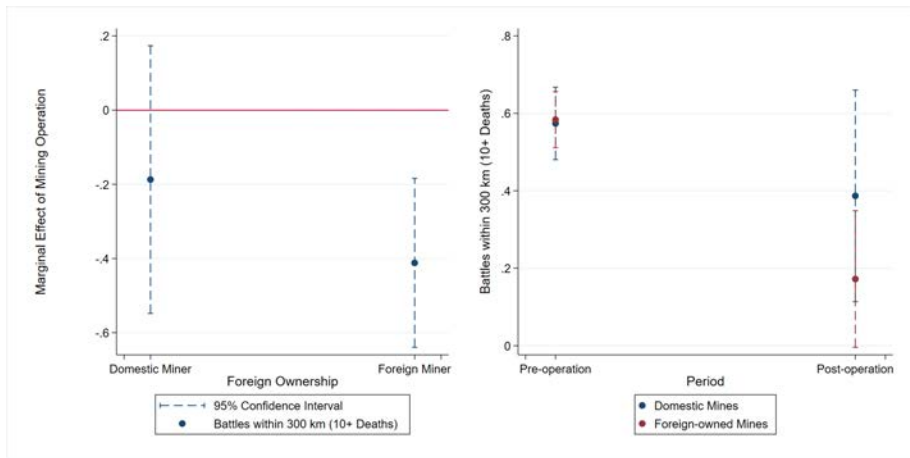
Model 2, within 100 km



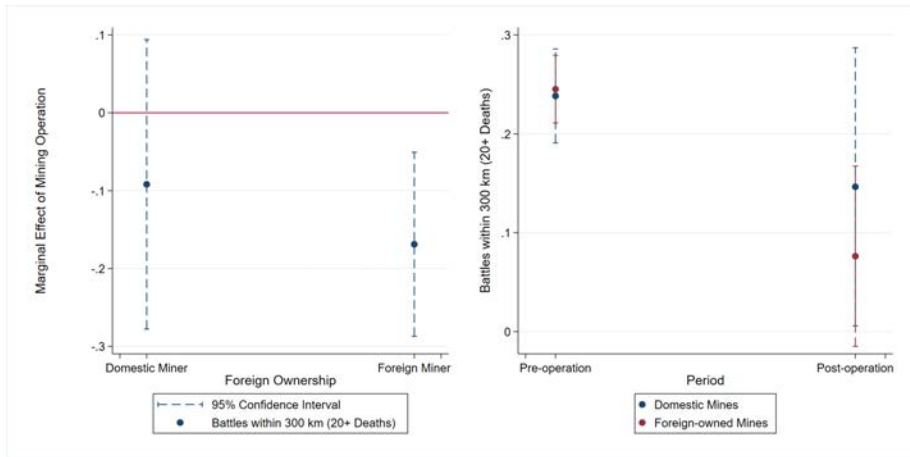
Model 2, within 500 km



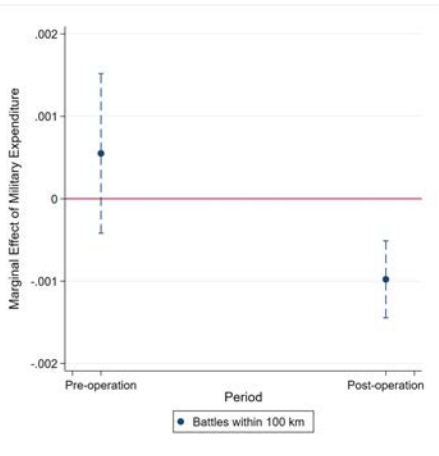
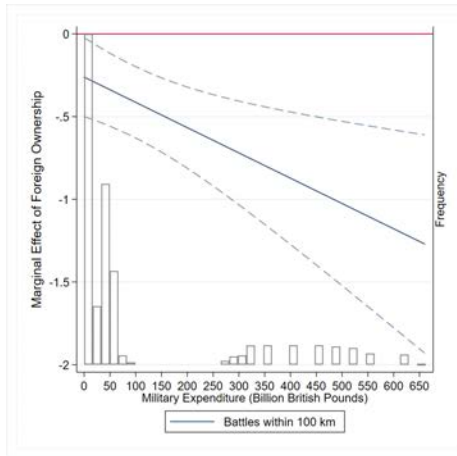
Model 2, 10+ Deaths



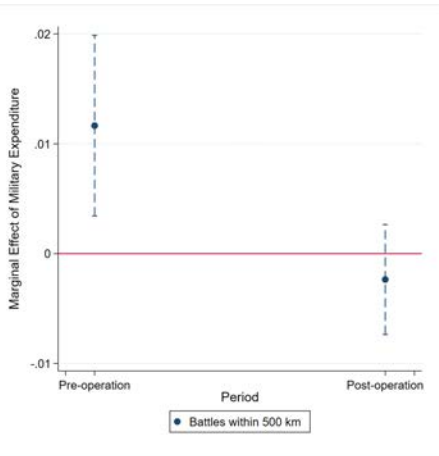
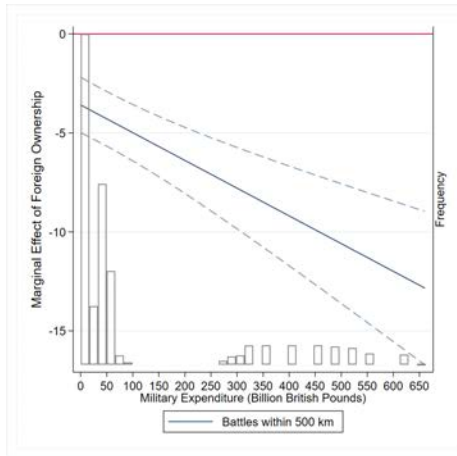
Model 2, 20+ Deaths



Military Capability, within 100 km

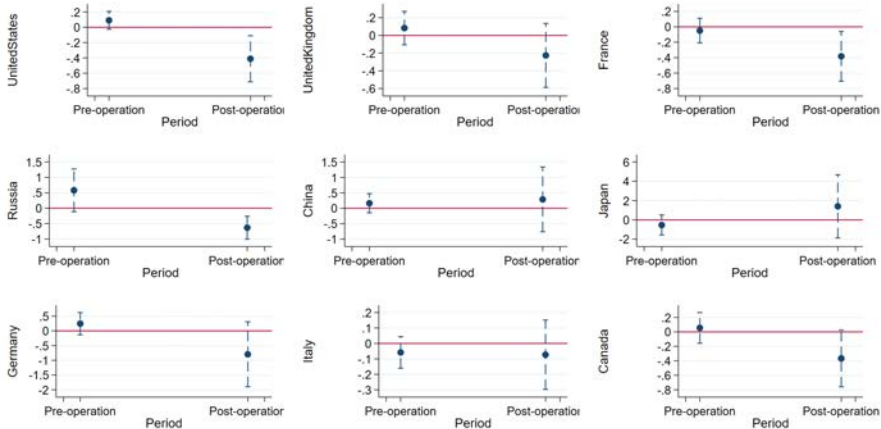


Military Capability, within 500 km



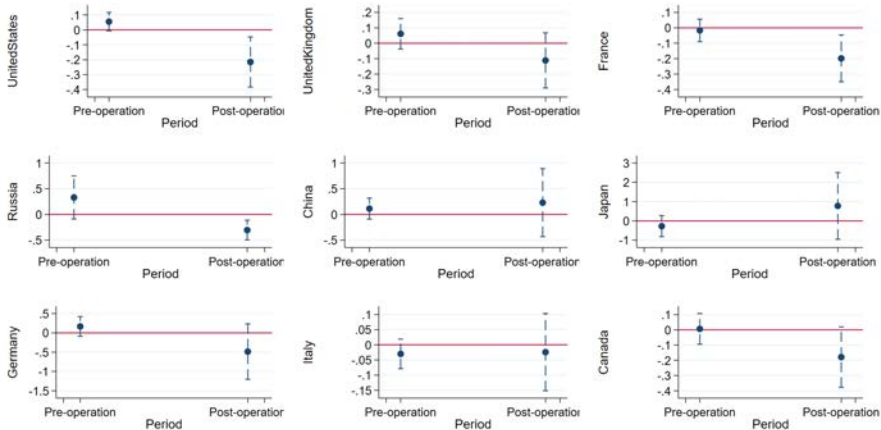
Military Capability, 10+ Deaths

Battles within 300 km (10+ Deaths)

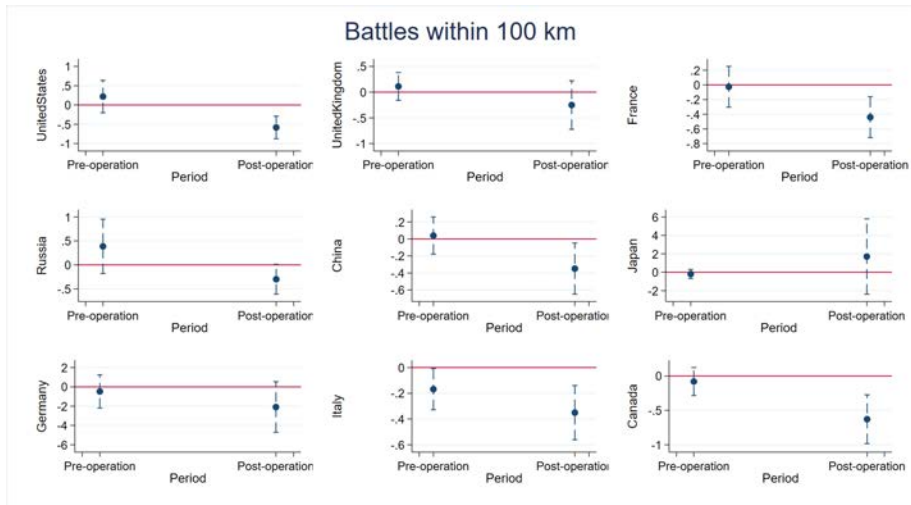


Military Capability, 20+ Deaths

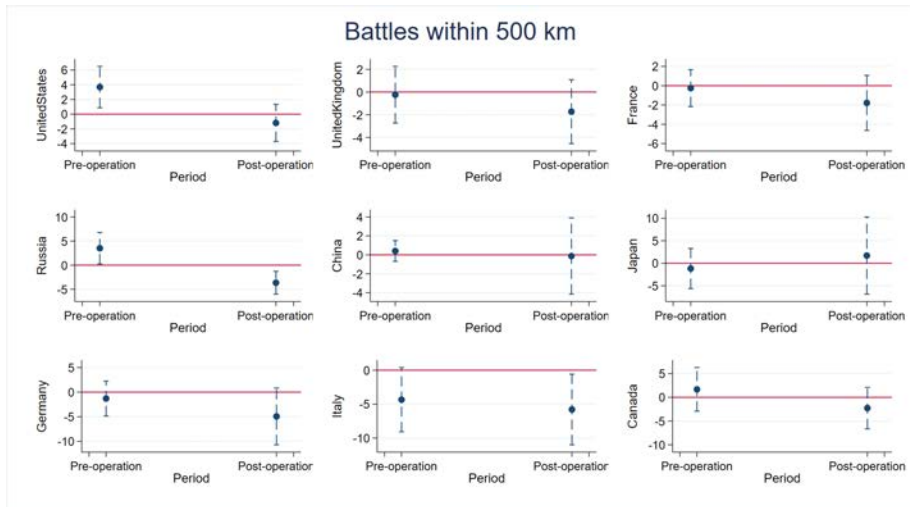
Battles within 300 km (20+ Deaths)



Nationality, within 100 km

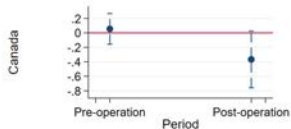
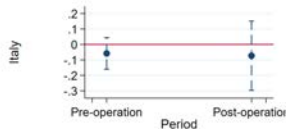
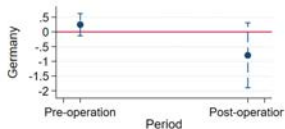
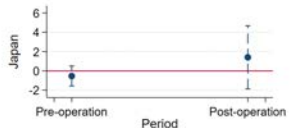
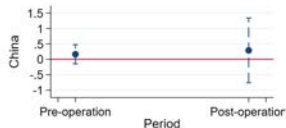
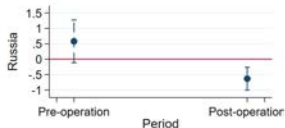
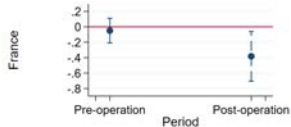
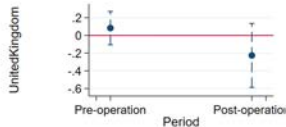
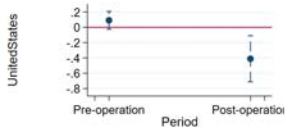


Nationality, within 500 km



Nationality, 10+ Deaths

Battles within 300 km (10+ Deaths)



Nationality, 20+ Deaths

Battles within 300 km (20+ Deaths)

