# Sanctions and the Exchange Rate in Time

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# Introduction

# Research question

✓ Russia's invasion of Ukraine reminder of interplay of geopolitics and international economics

→ Effects of sanctions on the exchange rate of targeted country?

# Motivation



The Economist

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- ✓ Good data fit: stronger import than export sanctions reduces USD scarcity + switch to consumption to less desired varieties →RUB appreciation

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- ✓ Limited evidentiary base on how sanctions affect exchange rates
- ✓ Confounding factors
  - → Does the response of the exchange rate reflect the effects of sanctions or that of Europe's largest military conflict since 1945?

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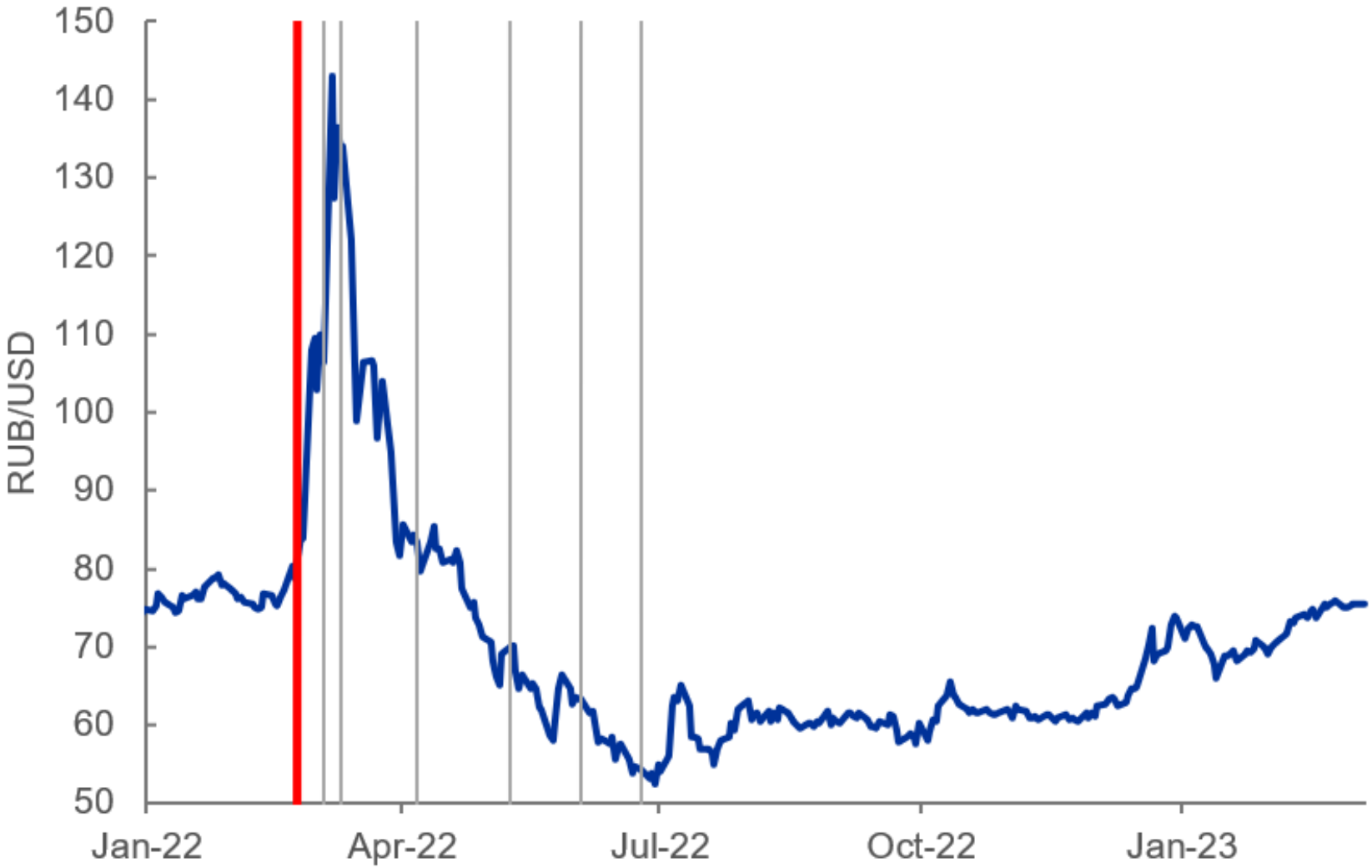
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RUB/USD
Jan-22
Apr-22
Jul-22
Oct-22
Jan-23

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  - Previous data lacking sufficient granularity to identify sanctions by type and date
- ✓ New database on sanctions over 1914-1945
  - → Large economies targeted in this earlier era, facilitating comparisons with today's Russia
  - → 128 cases of sanctions, coded by timing and type

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  - Local projections controlling for country fixed effects, time fixed effects, war outbreaks and endings and relevant covariates
  - Conditional impact depending on type of sanctions taken and its timing
  - Estimated effects on variables acting as transmission channels (e.g. imports, exports and confiscated assets)

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- ✓ Effects depend on sanctions type, consistent with theory
  - Import restrictions → stronger exchange rate and falling imports (in line with theory)
  - Export restrictions → weaker exchange rate and falling exports (in line with theory)
  - Trade embargoes restricting both exports and imports → no significant impact (offsetting effects)
  - Asset freeze → weaker exchange rate proportional to the amount of assets frozen (in line with theory)
- ✓ Models tested do not just match developments in today's specific Russia episode but have broader applicability

# Related Literature

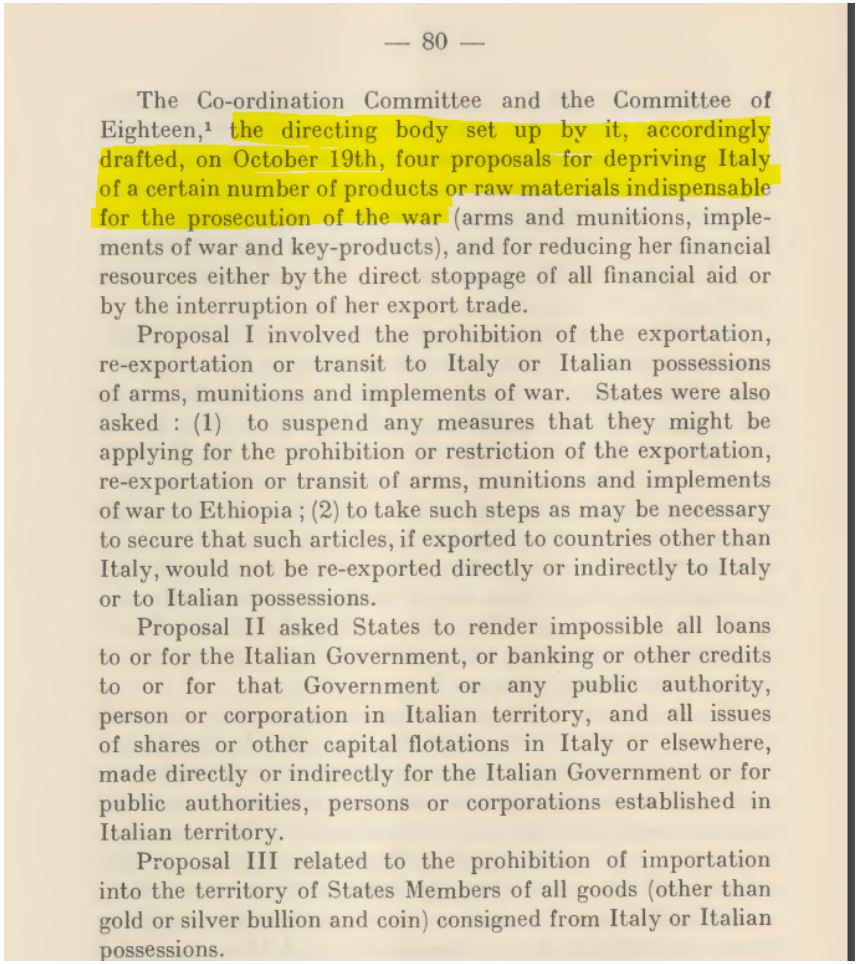
- ✓ Conceptual frameworks of how sanctions work: Kaempfer and Lowenberg (1988), Eaton and Engers (1992), Eaton and Engers (1999), Lorenzoni and Werning (2022), Itskhoki and Mukhin (2022)
- ✓ Features of sanction policies: Elliott and Hufbauer (1999), Hufbauer et al. (2009), Hufbauer et al. (2010), Clifton et al. (2014), Von Soest and Wahman (2015), Felbermayr et al. (2020)
- ✓ Empirical literature on international economic effects of sanctions: Dreger et al. (2016), Haidar (2017), Besedeš et al. (2017), Wang et al. (2019), Crozet and Hinz (2020), Laudati and Pesaran (2021), Besedeš et al. (2021), Federle et al. (2022)

# Data and stylized facts

# Data construction

- ✓ List of economic sanctions from Hufbauer et al (2009) and Mulder (2022) between 1914 and 1945
- ✓ Identification of features of sanctions using primary, contemporary and secondary sources, e.g. archives of the League of Nations, articles in contemporary newspapers and academic journals, scholarly accounts, etc.
- ✓ Focus on 1914-1945 because other periods not equally well suited to shed light on recent events:
  - Pre-1914: sanctions different subordinated to military policy in times of war or targeting minows in peace time ("gunboat diplomacy")
  - Post-1945: sanctions pursued to preserve democracy or human rights, targeting small economies

# Example



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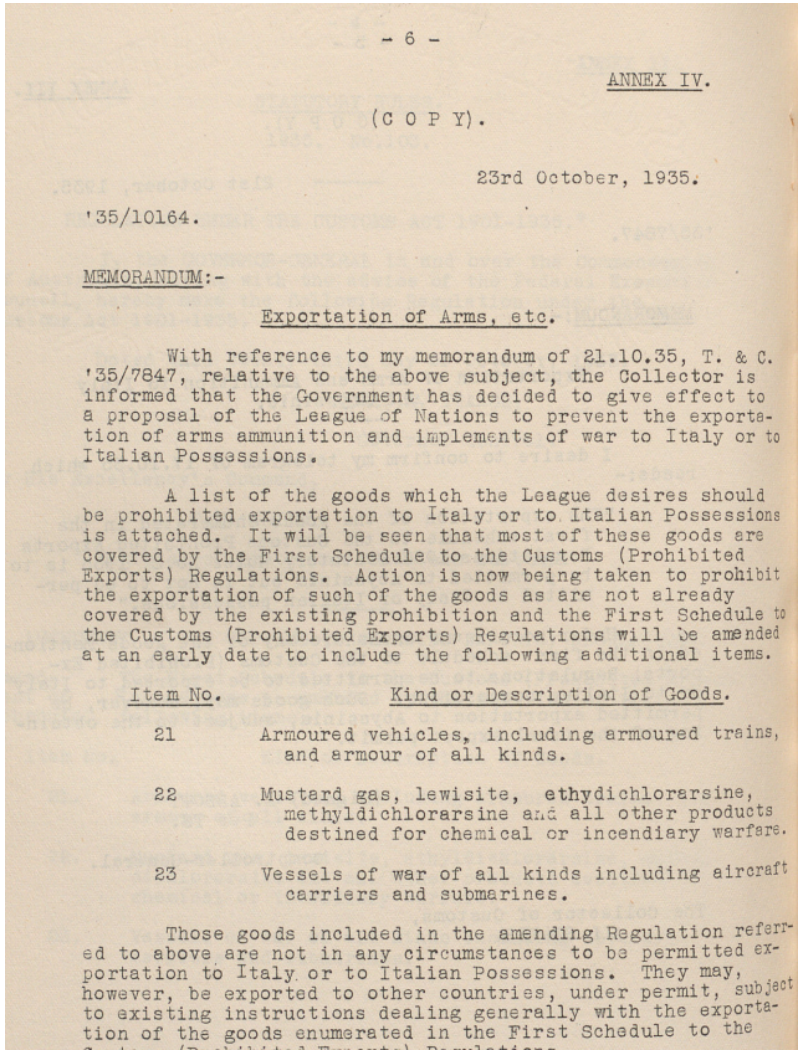
The Co-ordination Committee and the Committee of Eighteen,[1] the directing body set up by it, accordingly drafted, on October 19th, four proposals for depriving Italy of a certain number of products or raw materials indispensable for the prosecution of the war (arms and munitions, implements of war and key-products), and for reducing her financial resources either by the direct stoppage of all financial aid or by the interruption of her export trade.

Proposal I involved the prohibition of the exportation, re-exportation or transit to Italy or Italian possessions of arms, munitions and implements of war. States were also asked : (1) to suspend any measures that they might be applying for the prohibition or restriction of the exportation, re-exportation or transit of arms, munitions and implements of war to Ethiopia ; (2) to take such steps as may be necessary to secure that such articles, if exported to countries other than Italy, would not be re-exported directly or indirectly to Italy or to Italian possessions.

Proposal II asked States to render impossible all loans to or for the Italian Government, or banking or other credits to or for that Government or any public authority, person or corporation in Italian territory, and all issues of shares or other capital flotations in Italy or elsewhere, made directly or indirectly for the Italian Government or for public authorities, persons or corporations established in Italian territory.

Proposal III related to the prohibition of importation into the territory of States Members of all goods (other than gold or silver bullion and coin) consigned from Italy or Italian possessions.



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ANNEX IV.

(C O P Y).

23rd October, 1935.

'35/10164.

MEMORANDUM:-

Exportation of Arms, etc.

With reference to my memorandum of 21.10.35, T. & C. '35/7847, relative to the above subject, the Collector is informed that the Government has decided to give effect to a proposal of the League of Nations to prevent the exportation of arms ammunition and implements of war to Italy or to Italian Possessions.

A list of the goods which the League desires should be prohibited exportation to Italy or to Italian Possessions is attached. It will be seen that most of these goods are covered by the First Schedule to the Customs (Prohibited Exports) Regulations. Action is now being taken to prohibit the exportation of such of the goods as are not already covered by the existing prohibition and the First Schedule to the Customs (Prohibited Exports) Regulations will be amended at an early date to include the following additional items.

| Item No. | Kind or Description of Goods. |
|---|---|
| 21 | Armoured vehicles, including armoured trains, and armour of all kinds. |
| 22 | Mustard gas, lewisite, ethydichlorarsine, methyldichlorarsine and all other products destined for chemical or incendiary warfare. |
| 23 | Vessels of war of all kinds including aircraft carriers and submarines. |

Those goods included in the amending Regulation referred to above are not in any circumstances to be permitted exportation to Italy or to Italian Possessions. They may, however, be exported to other countries, under permit, subject to existing instructions dealing generally with the exportation of the goods enumerated in the First Schedule to the

# Example

### C.10 The Petrich Incident (1925)

**Description:** The Incident at Petrich, or War of the Stray Dog, was a Greek–Bulgarian crisis that resulted in a brief invasion of Bulgaria by Greece near the border town of Petrich after the killing of a Greek captain on October 18th, 1925. On October 22nd Greece sent soldiers into Bulgaria with the goal of enforcing their financial compensation demands. Bulgaria appealed to the League of Nations to intervene in the dispute, which ordered a ceasefire, Greek troops withdrew on October 28th and Greece was ordered to pay financial compensation to Bulgaria.

**Economic sanctions:** The Council of the league of Nations, the predecessor the United Nations' Security Council, discussed whether to impose economic sanctions on Greece on October 27th (Barros (1964), pp. 375-376).[39] Some members thought that the Council had to act quickly and decisively on the basis of Article 16 of the Covenant of the League—which allow members to severe all trade or financial relations with a country committing an act of war against another member. Other members thought that a blockade would be an unnecessarily large action in such a situation. The Council agreed not to undertake action under Article 16. Nevertheless, the possibility of a naval demonstration against the Greeks led the League Secretariat to engage in unofficial discussions as to the form, and legal authority, under which, if the need arose, such action should be taken. But Greece gave in to Council pressure the following day on October 28th, 1925.

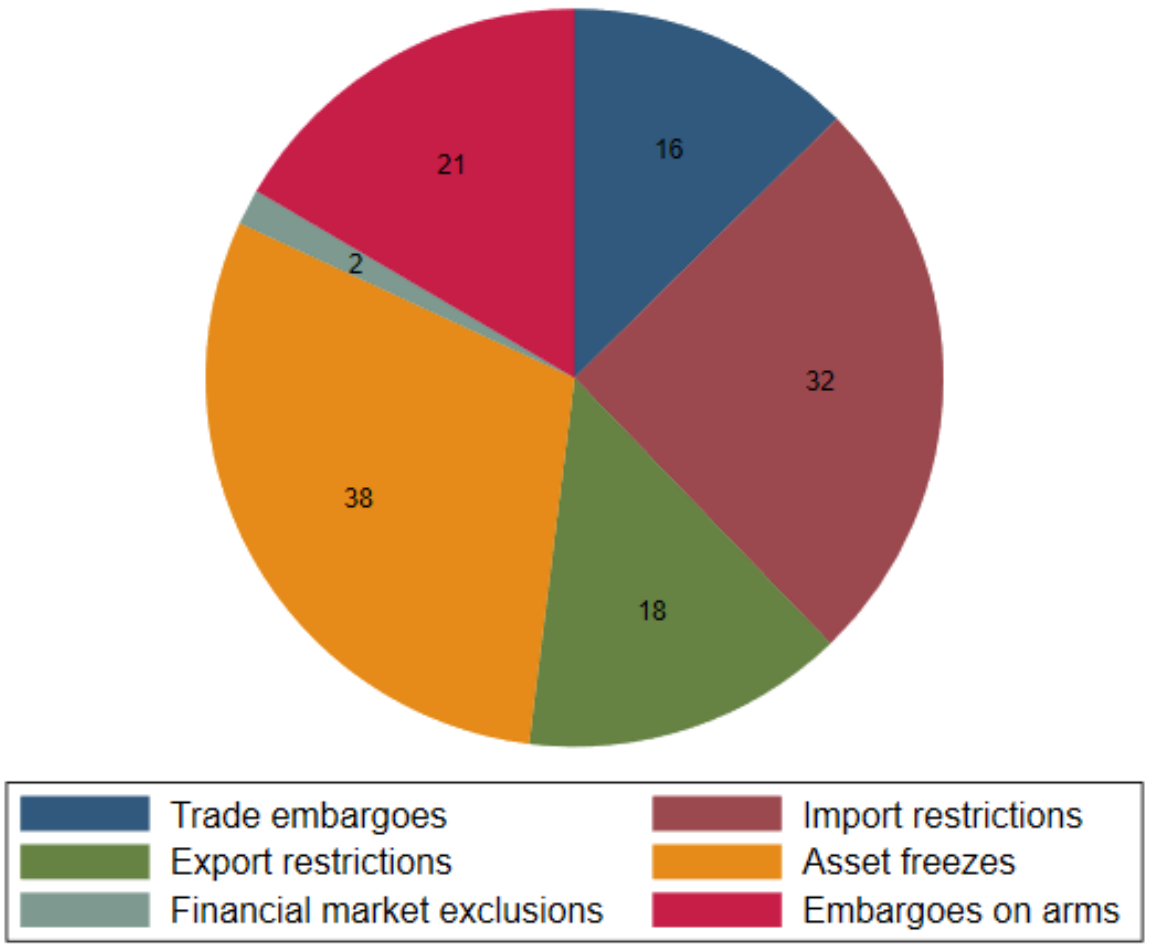
**Source:** Barros (1964).

# Availability of data

Information on sanction features:

- ✓ Date and type: trade embargoes, import restrictions, export restrictions, asset freezes, financial market exclusions, arms embargoes
- ✓ target vs. targeting country
- ✓ actual vs. threat of sanctions
- ✓ links to war or not
- ✓ initial vs. subsequent escalating or de-escalating measures

# Breakdown of sanctions by type: 1914-1945




**Notes**: The count of each type of sanctions is shown on its slice of the pie. There are in total 128 sanction-observations.

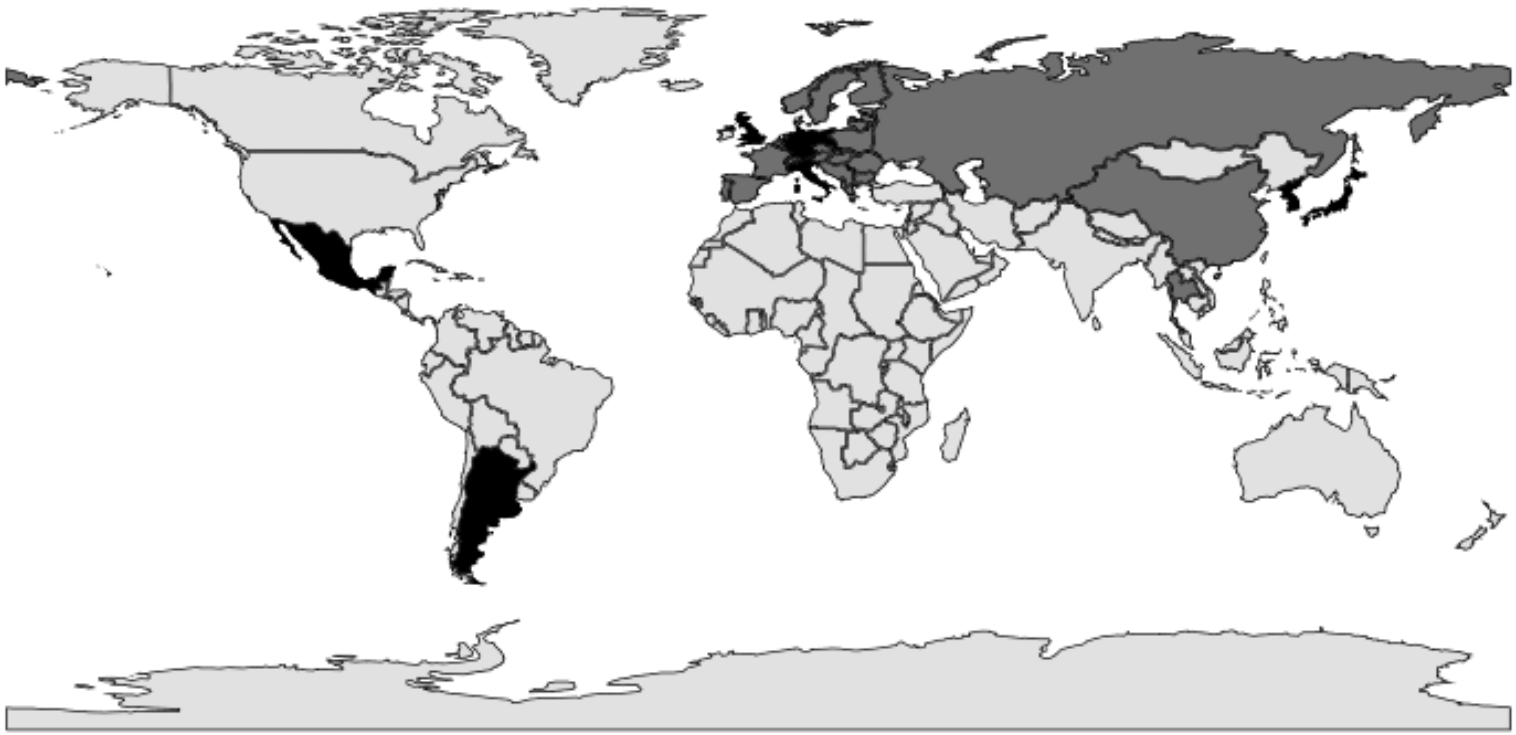
# Countries sanctioned: 1914-1918

**Notes**: The black shade corresponds to countries which were targeted by economic sanctions, while the light grey shade shows countries that were not.

# Countries sanctioned: 1919-1938

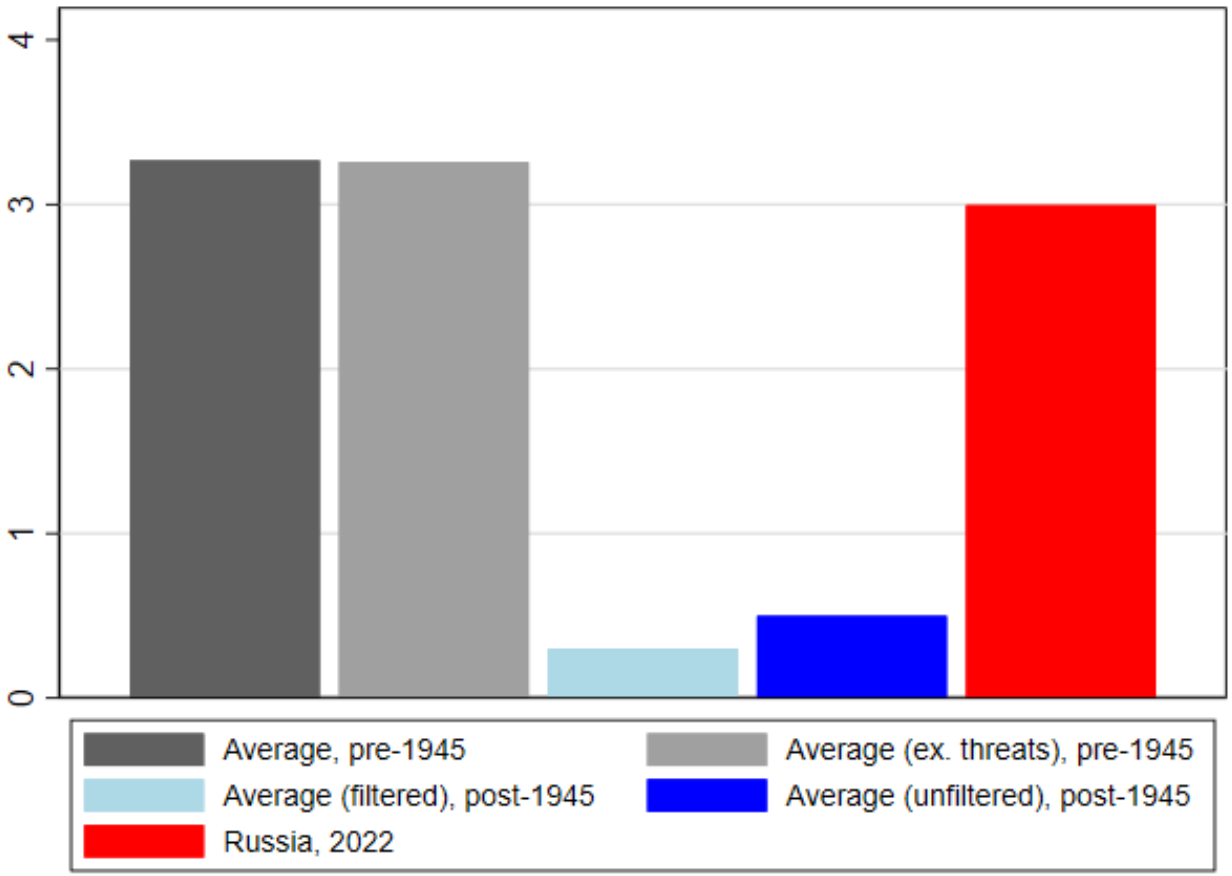
**Notes**: The black shade corresponds to countries which were targeted by economic sanctions, the dark grey shade shows countries that were threatened by sanctions and the light grey shade countries that were not sanctioned.

# Countries sanctioned: 1939-1945



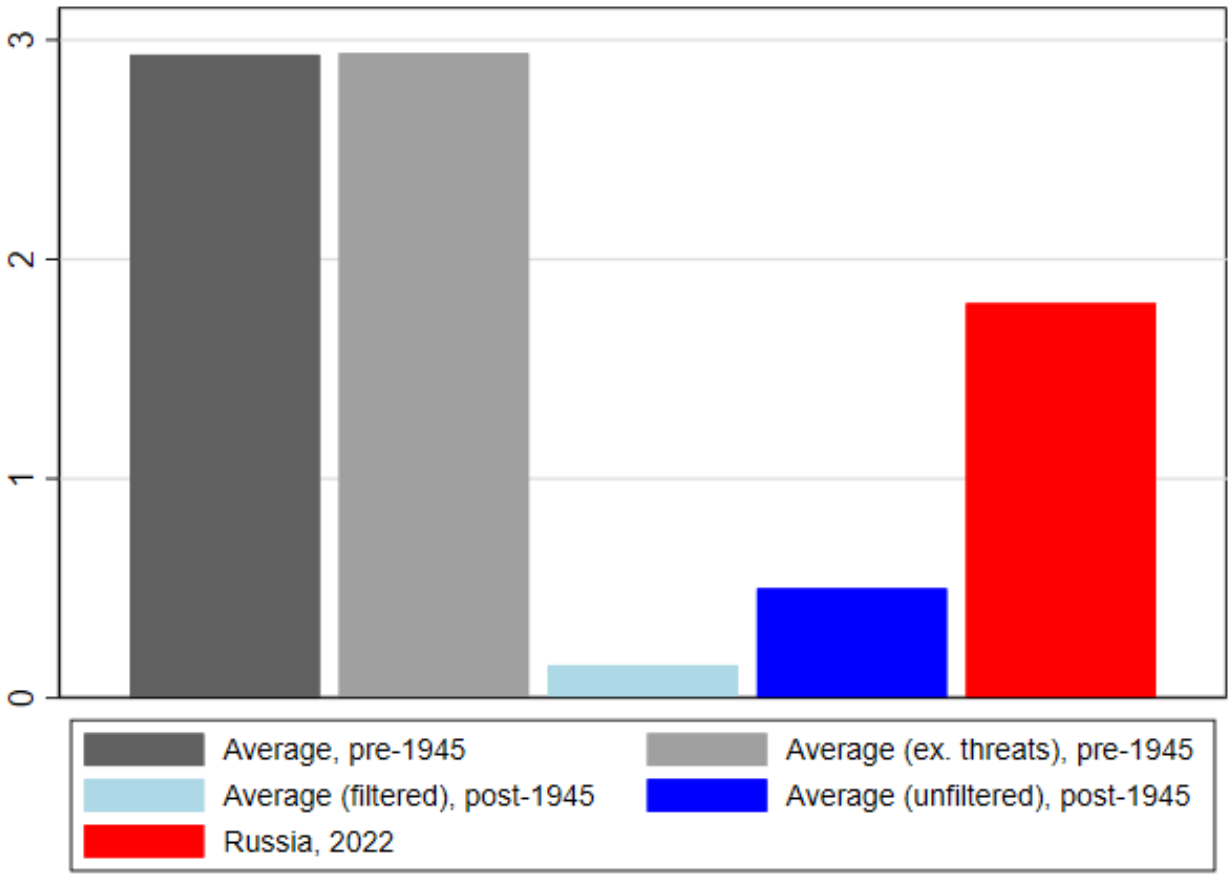
**Notes**: The dark grey shade corresponds to countries which were targeted by asset freezes, the black shade shows countries that were targeted by other economic sanctions (e.g. trade restrictions) and the light grey shade countries that were not sanctioned. Sanctions for Mexico and Argentina shown on the map were threats, not actual sanctions.

# Average share of global GDP per sanctioned country (%)—Selected periods




**Notes**: The light blue bar corresponds to filtered cases where (i) the objective of sanctions was to "end war", "prevent war", or "territorial conflict" and (ii) measures targeted arms and international trade or financial transactions.

# Average share of global trade per sanctioned country (%)—Selected periods

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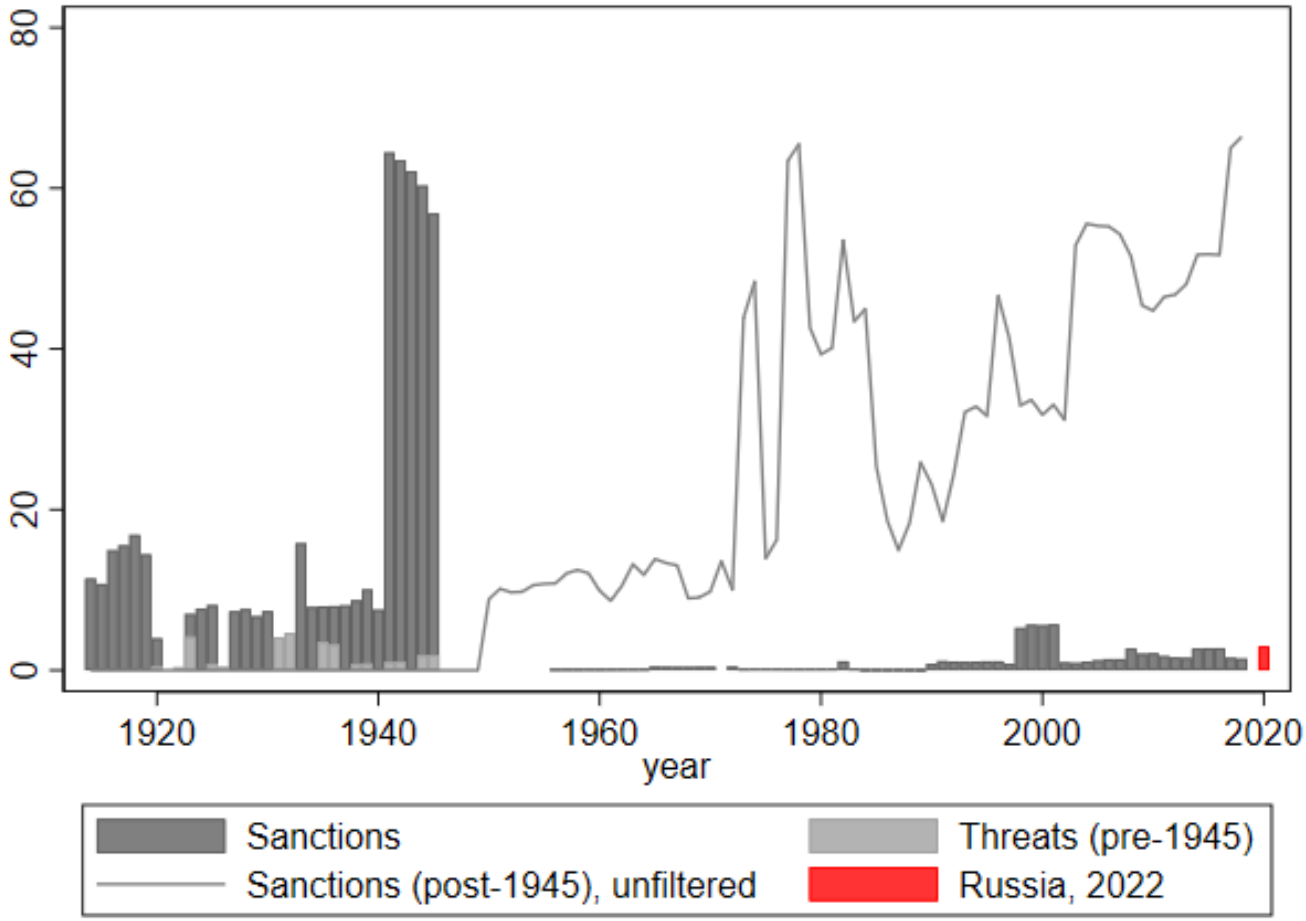


**Notes**: The light grey line post-1945 corresponds to all cases of sanctions; the dark grey bars post-1945 to filtered cases where (i) the objective of sanctions was to "end war", "prevent war", or "territorial conflict" and (ii) measures targeted arms and international trade or financial transactions.

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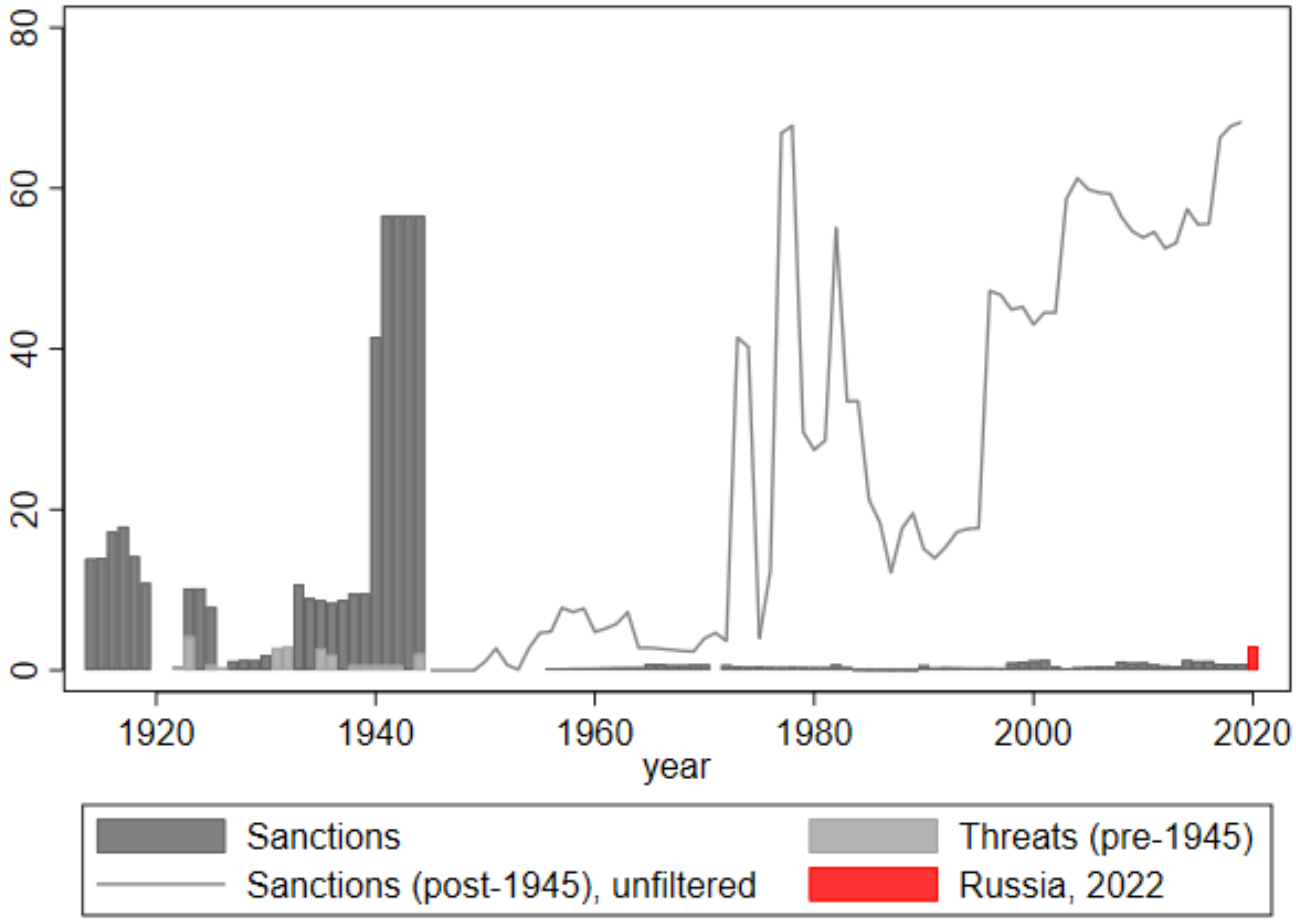


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# Empirical framework and hypotheses

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Panel local projection estimates of the reaction of the exchange rate to sanctions up to horizon $k$:

$$s_{i,t+k} - s_{i,t-1} = \alpha_i + \alpha_t + \beta_k^j Sanction_{i,t}^j + \Gamma' X_{i,t} + \varepsilon_{i,t+k} \quad (1)$$

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- $\alpha_i$ & $\alpha_t$: currency fixed effects & year fixed effects
- Sanction of type $j$: trade embargoes, import restrictions, export restrictions, asset freezes

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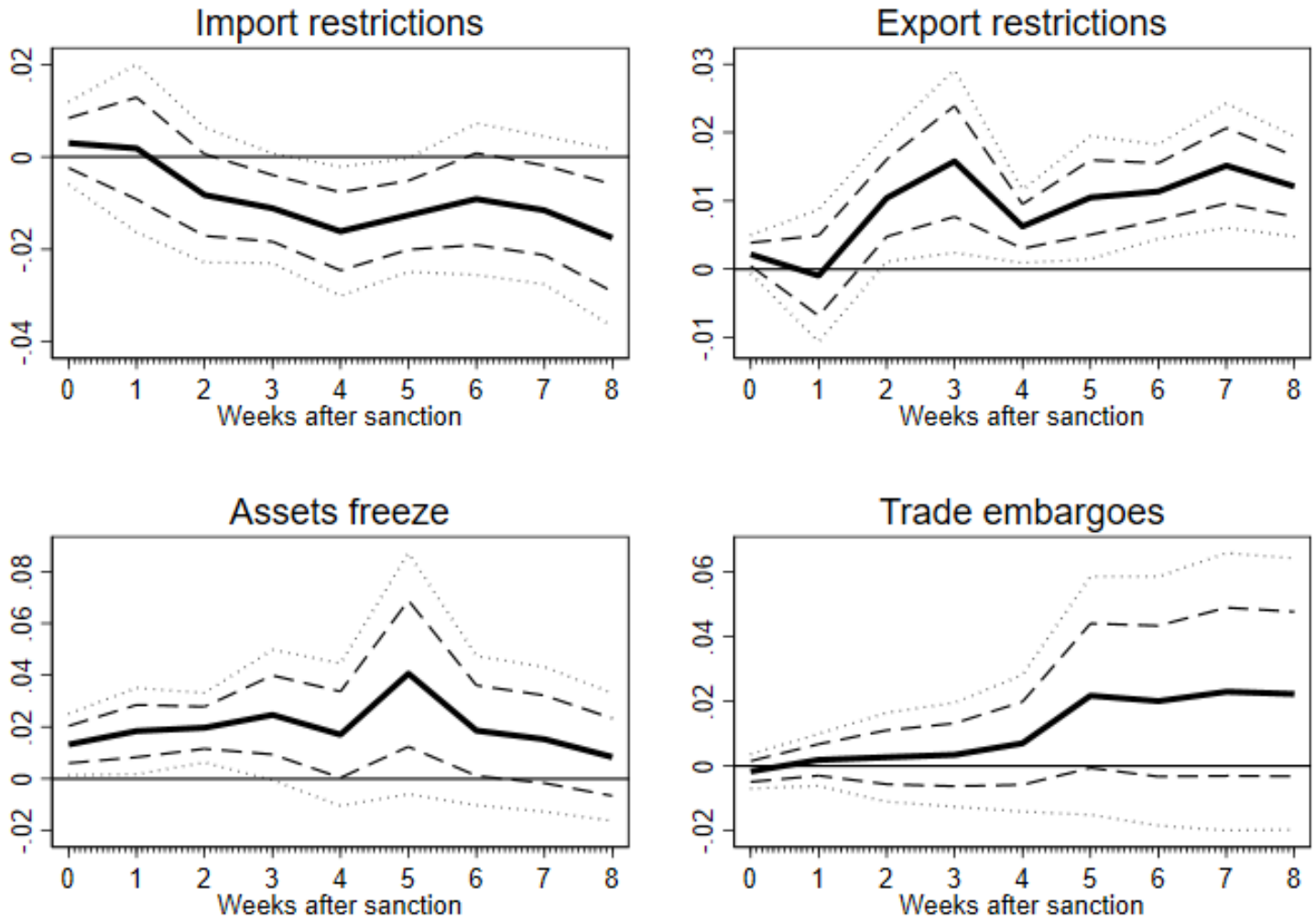
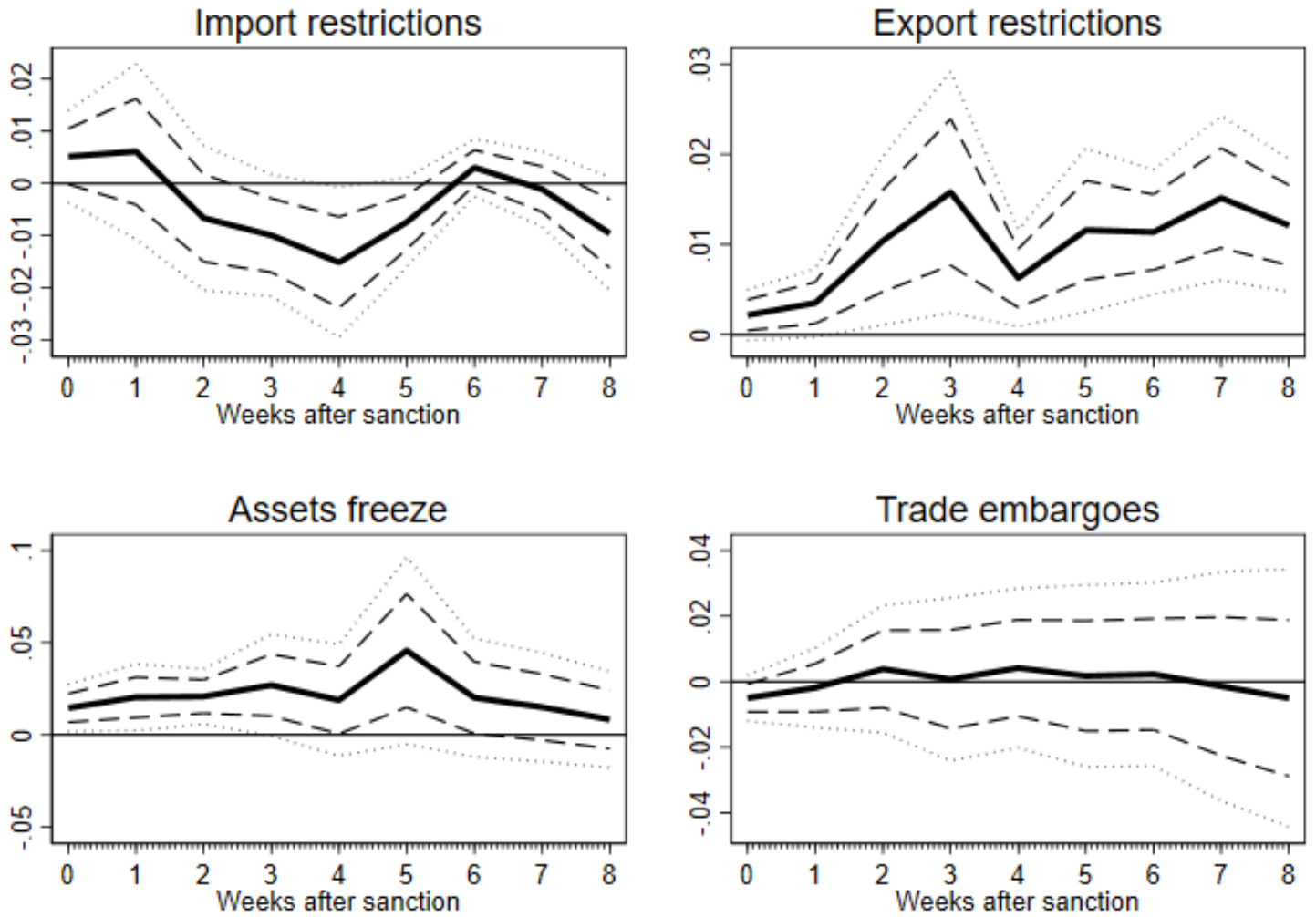
# Estimates

# Basic estimates on full sample




**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

# Excluding threats

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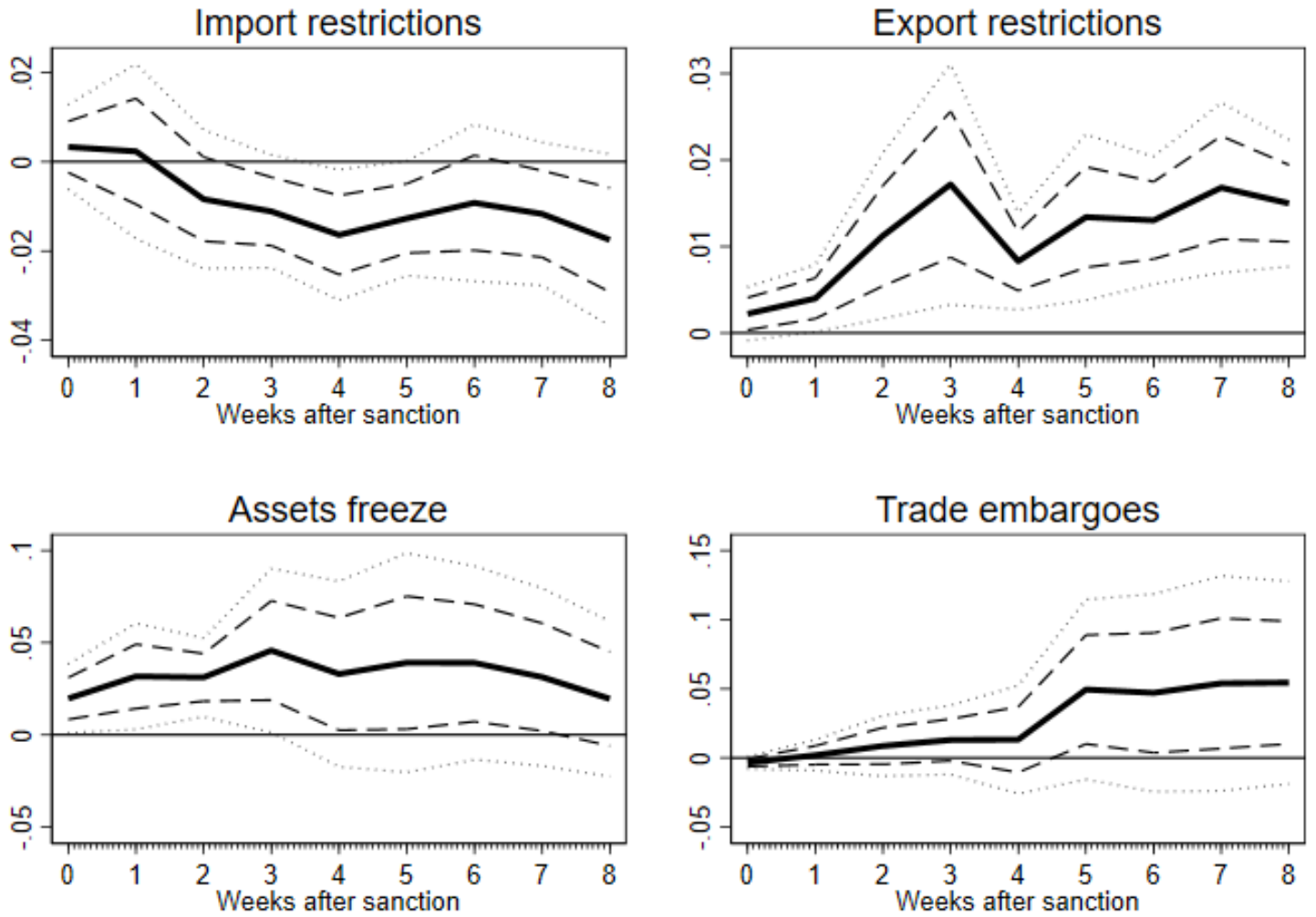
# Controlling for financial openness

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# Robustness exercises

- ✓ Control for Geopolitical risk
- ✓ Control for trade openness
- ✓ Control for trade tariffs
- ✓ Control for country × year fixed effects
- ✓ Exclude sanctions imposed by the League of Nations
- ✓ Consider only currencies under gold standard or part of a currency bloc
- ✓ Use Swiss black market data for WWI
- ✓ Control for import and export sanctions simultaneously & test for pre-trends

# Mechanisms—Imports and Exports

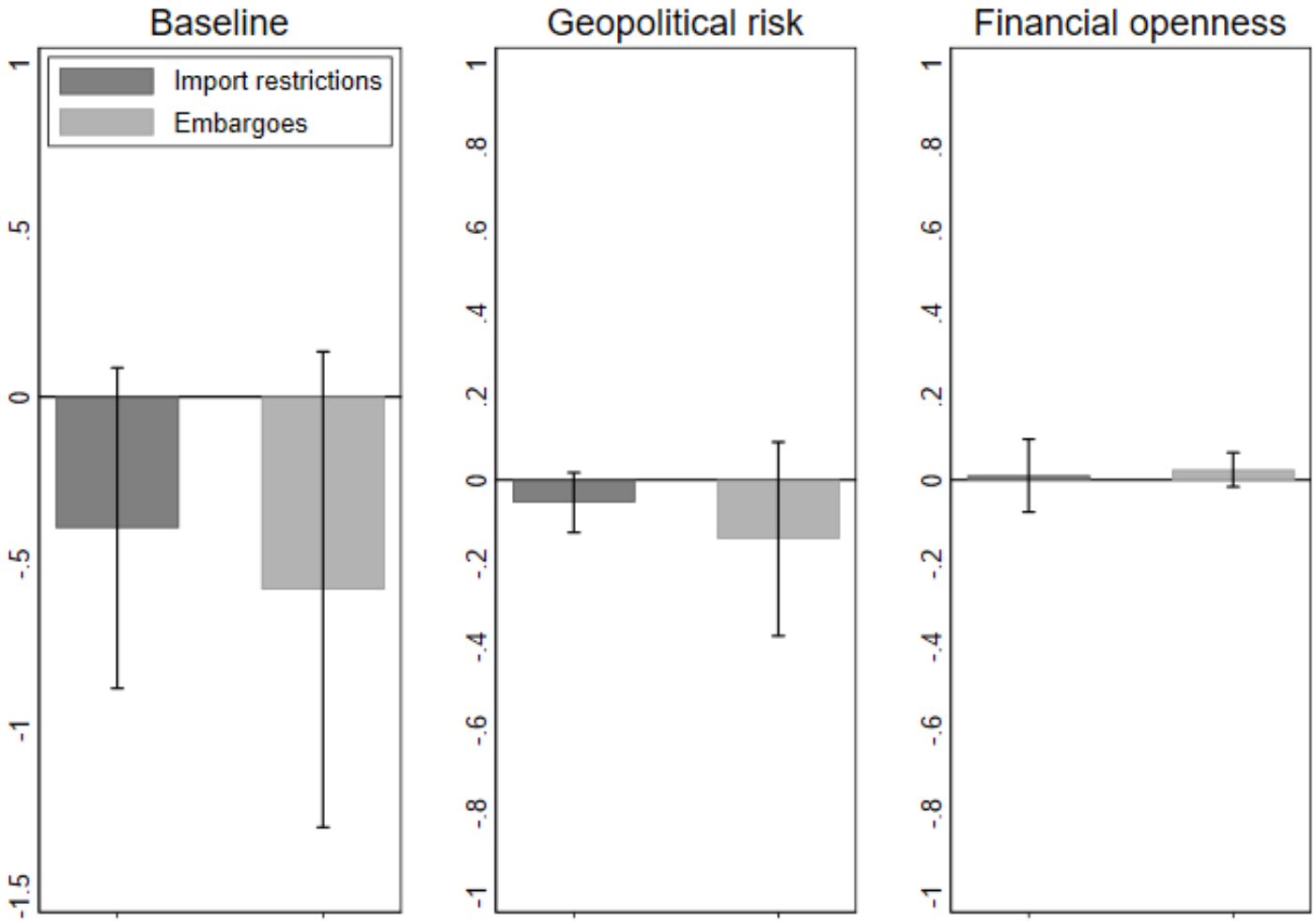
OLS estimates of the reaction of relevant macro variable to sanctions:

$$y^l_{i,t} - y^l_{i,t-1} = \alpha_i + \alpha_t + \beta^j Sanction^j_{i,t-1} + \Gamma' X_{i,t-1} + \varepsilon_{i,t} \tag{2}$$

where:

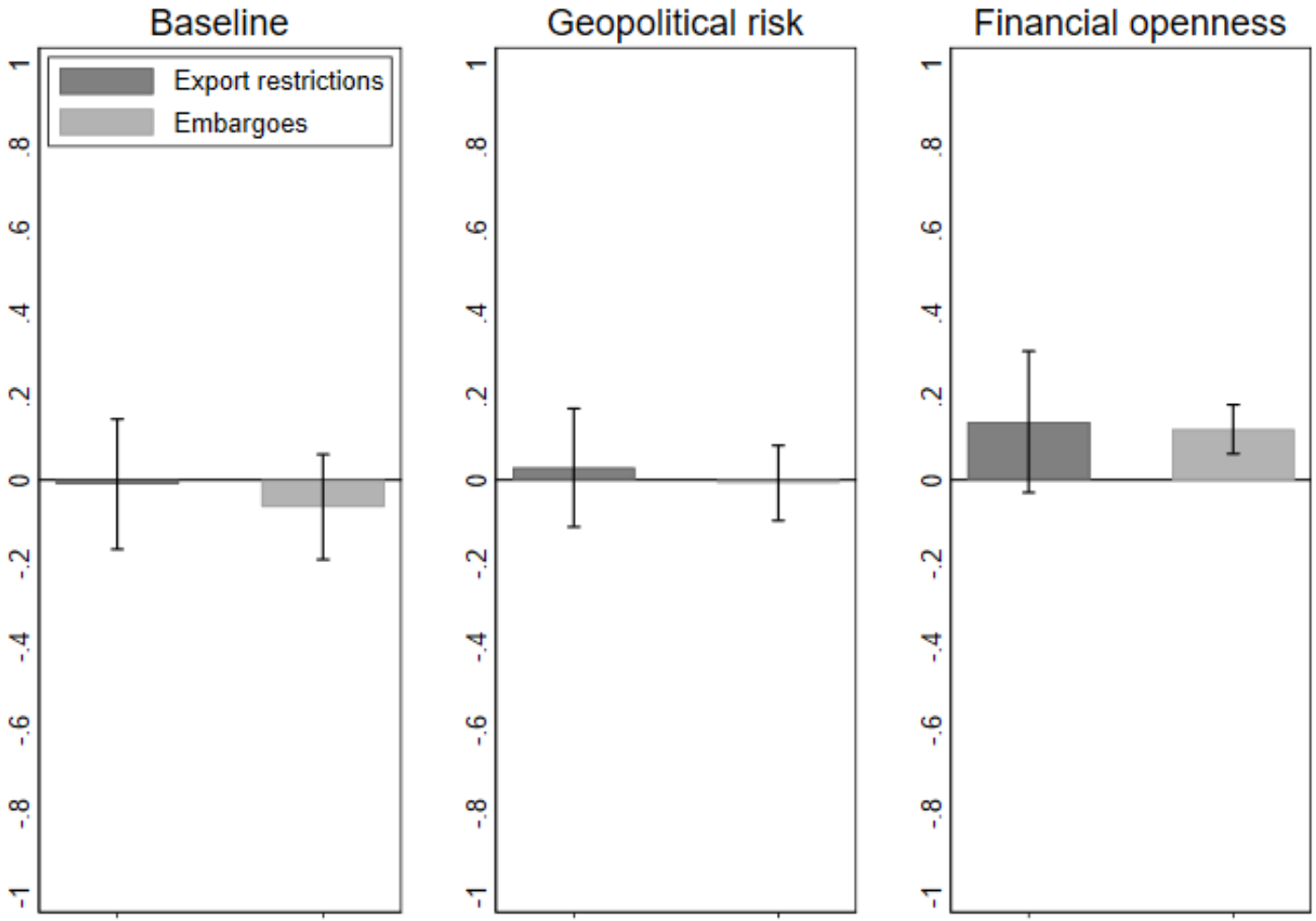
- $y^l_{i,t}$: log of macro variable $l$ in country $i$ in year $t$ predicted by theory as transmission channel: imports & exports (Federico and Tena-Junguito (2019)

# Mechanisms—Imports




**Notes**: OLS estimates over 1914-1938 controlling for year fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings (LHS panel), and geopolitical risk (middle panel) or financial oppeness (RHS panel). 90% confidence intervals are shown as whiskers.

# Mechanisms—Exports

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# Mechanisms—Assets freeze

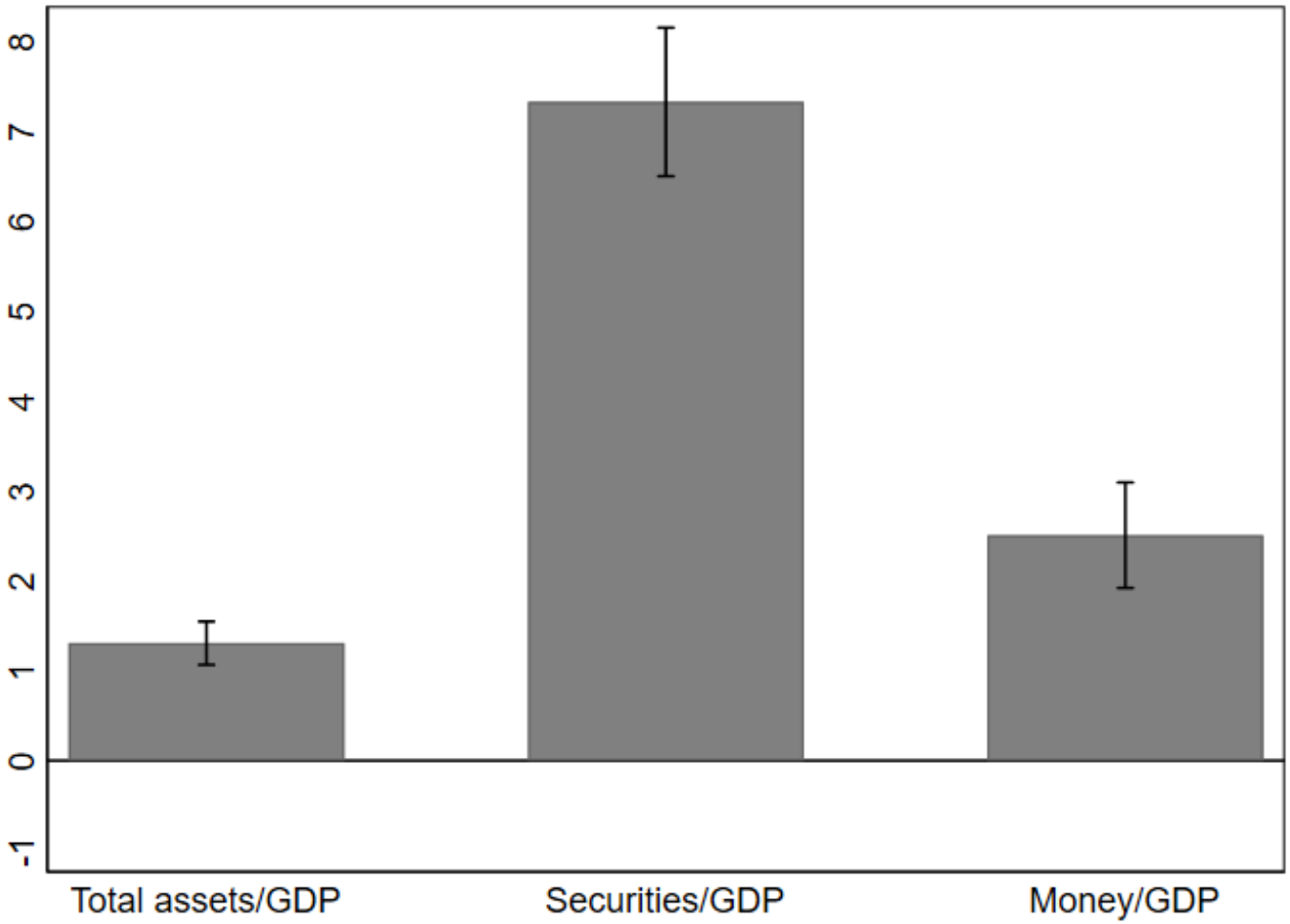
Test if the 1-month depreciation of the exchange rate around asset freeze sanctions correlates with the amount of assets frozen:

$$y_{i,t_0+4} - y_{i,t_0} = \alpha + \beta(W/Y)_i + \varepsilon_i \tag{3}$$

where:

- $y_{i,t_0+4} - y_{i,t_0}$: log change of the exchange rate of country $i$ 4 weeks after an asset freeze sanction
- $(W/Y)_i$ is the amount of assets frozen as share of GDP according to a US Treasury survey of 1941 on foreign-owned assets in the United States

# Mechanisms—Asset freeze




**Notes**:OLS estimates of Equation (2) where the dependent variable is the average 1-month exchange rate depreciation (in percent) of countries sanctioned by US asset freezes in World War II. Alternative asset definitions are considered, taking data from a survey conducted by the US Treasury in 1941 to estimate the value of assets held in the US by the countries sanctioned. 90% confidence intervals are shown as whiskers.

# Conclusions

## ✓ 3 take-home conclusions

- Factual evidence that today's sanctions on Russia are unprecedented since World War II
- Evidence that the effects of sanctions on exchange rate and mechanisms depends on sanction type
- Evidence on the transmission channel in line with theory

## ✓ Implications for research and policy

- Recent models of the effects of sanctions on the exchange rate have broader applicability than just today's Russia episode
- The direction of exchange rate moves not adequate metric of success or failure of sanctions but a reflection of type and scale of measures taken

# Appendix

Besedeš, T., Goldbach, S., Nitsch, V., 2017. *You're banned! The effect of sanctions on German cross-border financial flows.* Economic Policy, 32(90), 263-318.

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# Controlling for geopolitical risk


**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

◂ Go back

# Controlling for trade openness


**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

◂ Go back

# Controlling for trade tariffs


**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

◂ Go back

# Controlling for country × year fixed-effects


**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

◂ Go back

# Exclude santions imposed by the League of Nations


**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

◂ Go back

# Consider only currencies under gold standard or part of a currency bloc


**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

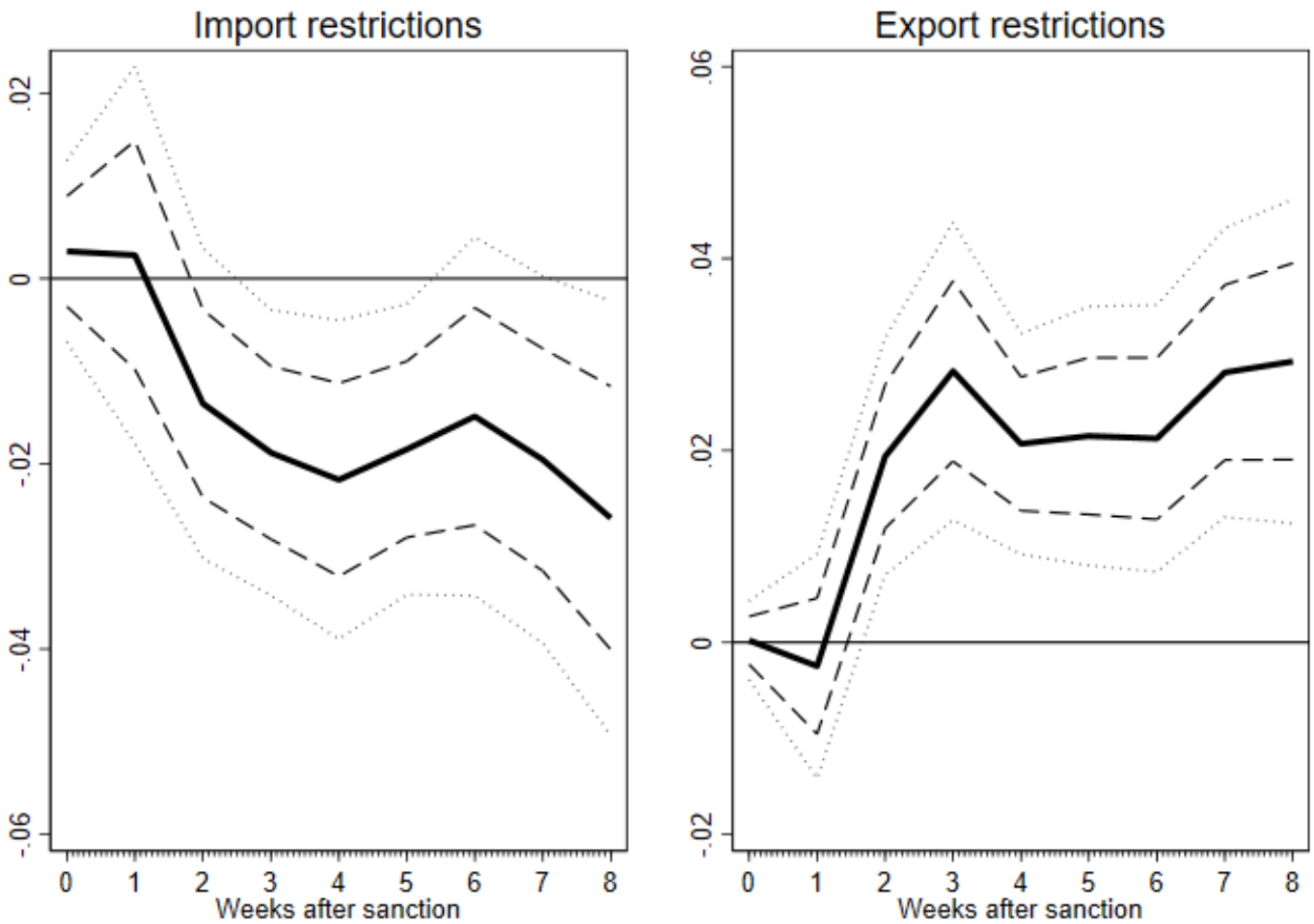
◂ Go back

# Use black market data for WWI


**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

◂ Go back

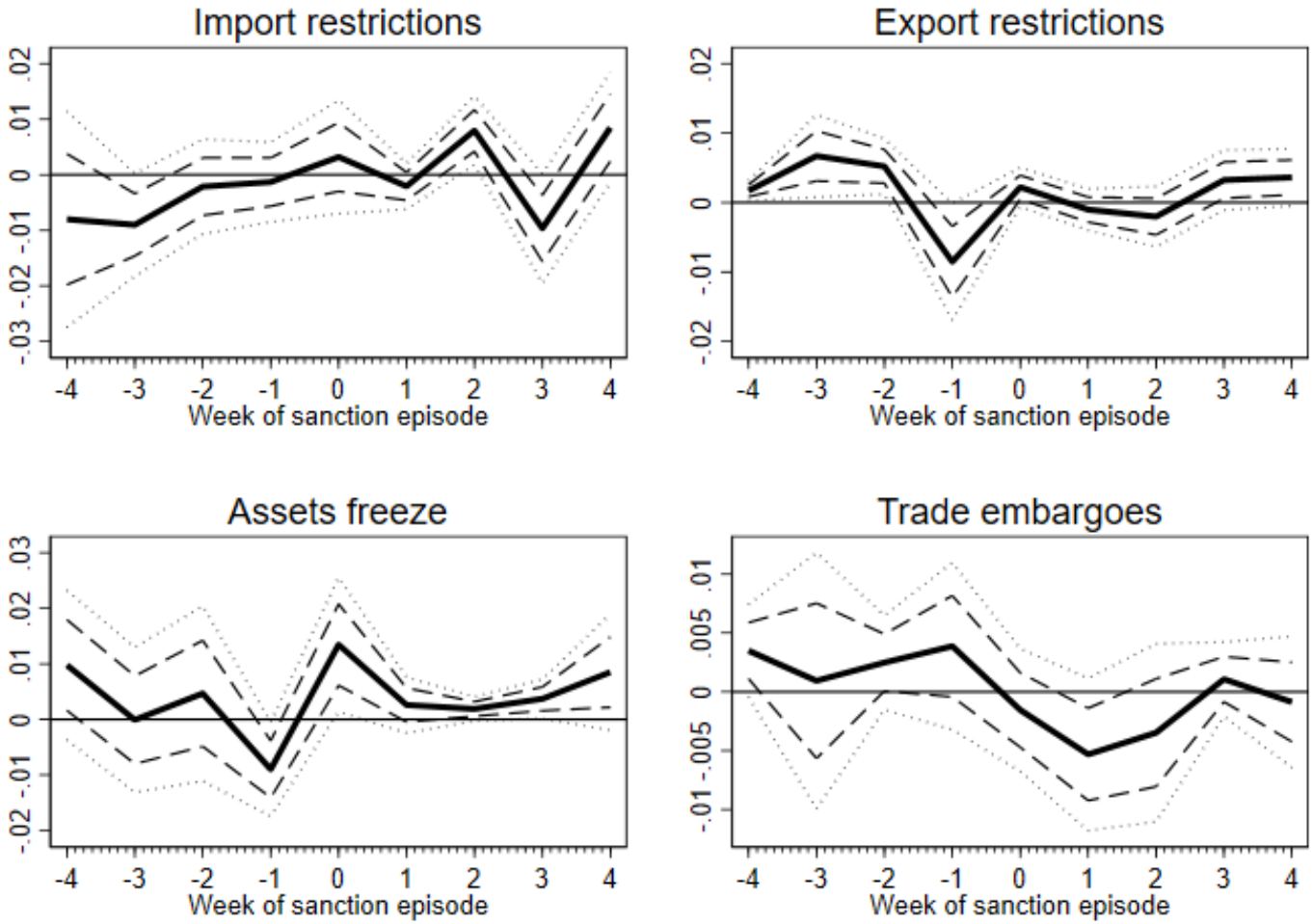
# Control for import and export sanctions simultaneously




**Notes**: Full sample panel local projection estimates by OLS controlling for year fixed effects, week fixed effects, currency fixed effects and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

◂ Go back

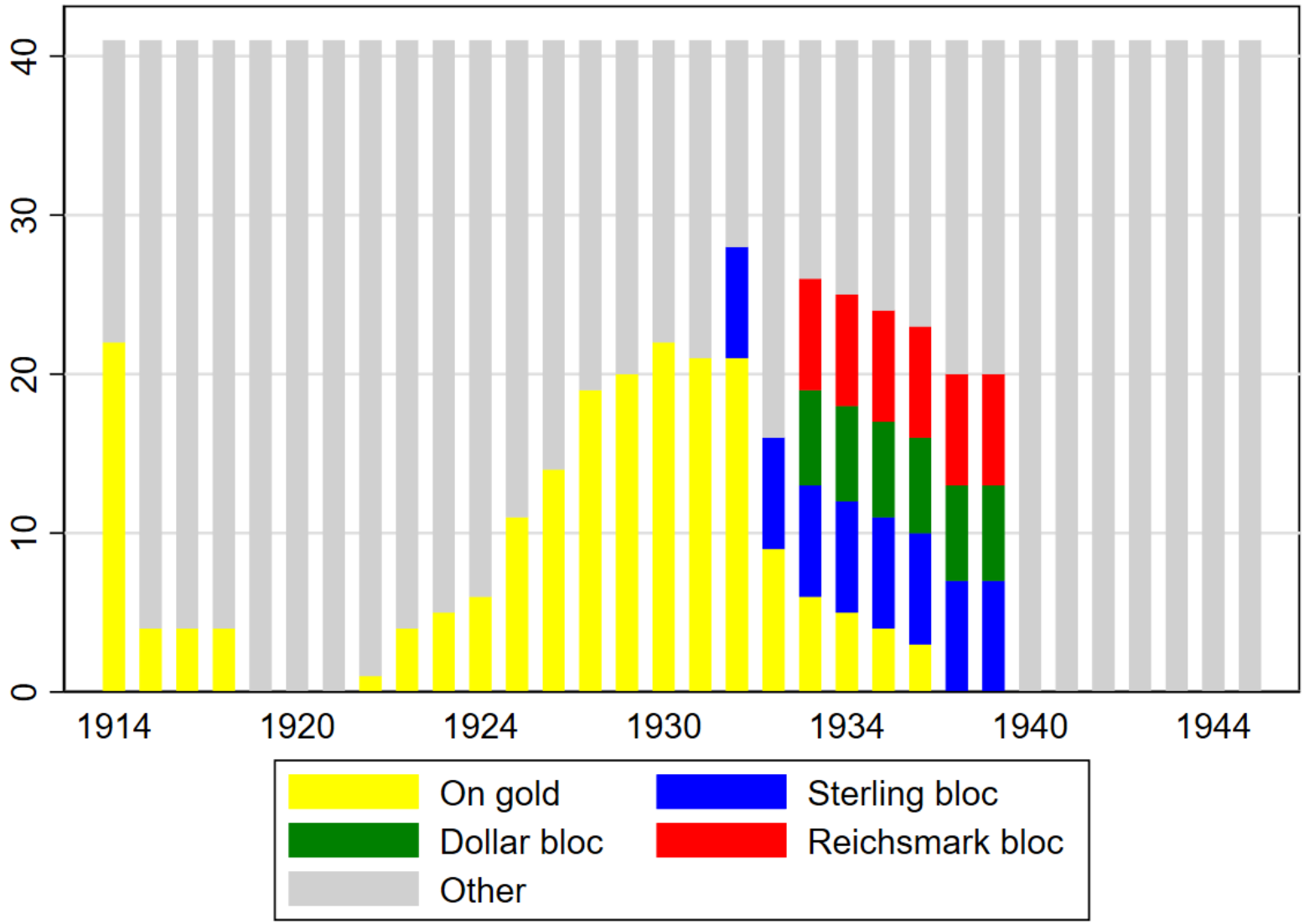
# Test for pre-trends as in Freyaldenhoven et al. (2019)




**Notes**: The figure shows the estimated exchange rate changes in weeks around sanction events in the spirit of Freyaldenhoven et al. (2019).

Go back

# Share of countries in gold standard or within currency blocks



# Exchange rate volatility across time