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### **Sanctions and the Exchange Rate in Time**

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# Sanctions and the Exchange Rate in Time\*

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## Abstract

We test the predictions of recent theoretical studies of the impact of sanctions on the exchange rate. We build a database of exchange rates and sanctions spanning 1914–1945—an era when both large and small economies were targeted by multilateral sanction packages, facilitating comparisons with today’s Russian war episode. We estimate the dynamic response of the exchange rate in a panel of sanction episodes at weekly frequency using local projections, conditioning on the type of sanctions taken. We tease out mechanisms through which sanctions affect the exchange rate by estimating their effects on macroeconomic variables plausibly acting as transmission channels. Our estimates suggest that import restrictions, export restrictions, asset freezes and trade embargoes lead to exchange rate effects consistent with theory, though the precision of the measured effects varies across sanction type. These findings suggest that recent models of the effects of sanctions on the exchange rate do not just match developments in today’s specific Russia episode but have broader applicability. It follows that the direction of exchange rate movements is not an adequate metric of the success or failure of sanctions but a reflection of the type and scale of the measures taken.

**Keywords:** Exchange Rate Determination, Sanctions, Geopolitics, International Trade and Finance, World Wars I and II, Interwar Period

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# 1 Introduction

Russia’s invasion of Ukraine is transforming global economic and security relations.<sup>1</sup> It has led to the imposition of trade and financial sanctions of a scale and scope unprecedented since World War II. It serves as a reminder of the importance of the interplay of geopolitics and international economics.

An area of particular attention is the interaction of sanctions and international finance. Brunnermeier et al. (2022) and Eichengreen (2022), as well as policy makers and market participants<sup>2</sup>, have raised the question of whether sanctions will have implications for the structure of the international monetary system, by encouraging nations to bypass the US dollar and other traditional international and reserve currencies.<sup>3</sup>

Another question, on which we focus, is the effect of sanctions on the exchange rate of the targeted country. The behavior of the Russian rouble following the imposition of sanctions highlights why this is an issue of interest. When Russia invaded Ukraine on February 24th, 2022 and sanctions were imposed, the rouble initially lost more than 60% of its value against the US dollar. Subsequently, it recovered fully, however, giving rise to speculation on whether sanctions had the intended effect (see Figure A.1).<sup>4</sup>

Theoretical studies (Itskhoki and Mukhin (2022) and Lorenzoni and Werning (2022)) provide conceptual frameworks for understanding the impact of sanctions on the exchange rate. They show that the effects on the foreign exchange market depend on the type of sanctions<sup>5</sup>, as well as on their timing and intensity. Impacts might also depend on the response of the sanctioned country—on the presence or absence of countermeasures, sanction busters and options for evasion.<sup>6</sup>

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<sup>1</sup>See e.g. Snower (2022).

<sup>2</sup>Including warnings by the IMF’s chief economist (“Russia sanctions threaten to erode dominance of US dollar”, says IMF”, *Financial Times*, March 21st 2022) and subsequent analyses by Dooley et al. (2022) and Weiss (2022).

<sup>3</sup>Preliminary evidence (Berthou (2022)) looking at trade invoicing micro-data suggests this was already the case after the first round of international sanctions against Russia in 2014.

<sup>4</sup>See e.g. “US insists sanctions are working despite rouble’s rebound”, *Financial Times*, April 1st, 2022. The rouble dropped in value especially in the days after the US and the EU froze the international reserves of the central bank of Russia and the EU announced that it would “deswift” Russian financial institutions. The trough was reached on March 7th shortly after the assault by Russian forces of the Zaporizhzhia nuclear power plant. But by March 30th, the rouble had recovered its prewar value – to the surprise of many.

<sup>5</sup>In particular, Itskhoki and Mukhin (2022) distinguish between sanctions on exports, sanctions on imports, exit of multinationals, freezes of foreign assets, exclusions from financial markets and limits to access to safe assets. Lorenzoni and Werning (2022) distinguish between import rationing, import sanctions without rationing, and prospective asset freezes.

<sup>6</sup>Sanction busters are third parties that undermine or undercut sanctioning efforts (see Early (2015)).

Existing models make similar predictions for the effect of sanctions on the exchange rate, but their transmission channels differ. [Itskhoki and Mukhin \(2022\)](#) stress that the effect of sanctions on the exchange rate depends on the balance of currency demand and supply—sanctioning exports and freezing official reserve assets reduce foreign currency supply, while sanctioning imports reduces foreign currency demand, with the opposite effect. These predictions match developments in the rouble exchange rate: Russia’s currency recovered in mid-March from its initial depreciation at a time when tougher sanctions on imports than exports increased the supply of foreign currency—amid surging prices of oil and other commodities of which Russia is a major exporter—while the introduction of capital controls and financial repression by Russia reduced the demand for foreign currency. [Lorenzoni and Werning \(2022\)](#) emphasize another channel: sanctions that limit exports from source to target country prevent consumers in the latter from buying their preferred mix of foreign goods; consumers instead must purchase goods from countries not imposing sanctions, or else they must increase their savings in the form of foreign assets. Consumers in the target country are therefore likely to increase their consumption of domestic goods. In equilibrium, this raises the relative price of domestic goods, leading to appreciation of the real exchange rate.<sup>7</sup> This prediction matches developments in the rouble exchange rate as well.

But matching developments in a specific episode says nothing about the broader applicability of these models. It doesn’t help that the evidentiary base on the transmission channels through which sanctions affect the exchange rate is decidedly limited. Then there is the presence of confounding factors. In the current instance, the imposition of sanctions against Russia coincided with the invasion of Ukraine, which in turn had implications for energy, grain and other markets. Determining whether the response of the exchange rate reflects the effect of Europe’s largest military conflict since 1945 or that of the sanctions is challenging, to say the least.<sup>8</sup>

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[Itskhoki and Mukhin \(2022\)](#) consider capital controls and financial repression as tools reducing demand for foreign currency and hence putting downward pressure on the currency of the sanctioned currency. [Lorenzoni and Werning \(2022\)](#) consider the possibility that agents can legally or illegally evade restrictions and trade currency with one another, creating a black market on which the currency is traded at a price different from the official market price.

<sup>7</sup>A similar channel is present in the model of [Itskhoki and Mukhin \(2022\)](#), who recast the mechanism from the perspective of the goods market rather than the currency market.

<sup>8</sup>Consistent with this observation, [Federle et al. \(2022\)](#) find evidence of a “proximity penalty” in the stock market response to the Russian invasion of Ukraine. The closer countries are located to Ukraine (or the closer are individual firms within countries), the more negative are their equity returns in a four-week window around the start of the war.

In this paper, we use the longer history of sanctions to test the predictions of these models and tease out the underlying mechanisms. Although some of these hypotheses have been studied before, historical studies of the effect of sanctions on the exchange rate lack a conceptual framework. They rely on databases limited in scope and size, since they focus on the post-1945 period, when small economies were disproportionately targeted.<sup>9</sup> This renders them ill-suited for shedding light on recent events. Moreover, existing databases often lack the granularity needed to pinpoint sanctions by type and date. Hence they are poorly suited for testing recent models emphasizing the differing effects of sanctions by type and timing.

A contribution of this paper is therefore a new database spanning the period 1914-1945. In constructing this database, we extend earlier work by [Hufbauer et al. \(2009\)](#), [Hufbauer et al. \(2010\)](#), and [Mulder \(2022\)](#). Our rationale for focusing on this earlier era is that large as well as small economies were targeted by sanctions, enabling comparisons with recent experience. We collect weekly data on 128 cases of sanctions, coding them by timing and type.

The analysis is carried out at weekly frequency and relies on the historical exchange-rate database of [Vicqu ery \(2022\)](#), allowing to observe movements in the exchange rate at sufficiently high frequency to pinpoint the effect of sanctions. A further contribution of this paper is to collect new weekly data on the Swiss foreign-exchange market. Swiss financial markets substantially deepened following the closure of global exchange markets at the start of World War I and experienced the emergence of black foreign currency markets in repeated instances over the subsequent two decades. Our new data are therefore uniquely suited to analyze foreign exchange developments in periods of extreme capital controls, particularly in the run up to and during World War II.

We estimate the dynamic response of the exchange rate using local projections, controlling for country fixed effects, time fixed effects and covariates. We condition the impact on type of sanction imposed and its timing. We shed light on the mechanism through which sanctions affect the exchange rate by estimating their effects on macroeconomic variables plausibly acting as transmission channels, such as imports, exports and assets frozen.

Our data confirm that the breadth and scope of the sanctions taken against a country

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<sup>9</sup>See for instance [Wang et al. \(2019\)](#), [Laudati and Pesaran \(2021\)](#), and [Dreger et al. \(2016\)](#).

of the systemic importance of Russia are unprecedented since World War II. In contrast, countries facing economic sanctions during World War I and the interwar period were of a size comparable to today's Russia — about 2-3% of global GDP and trade. Countries facing economic sanctions after World War II were on average 10 times smaller, accounting for about 0.2-0.3% of global GDP and trade.

Our results further suggest that the effects of sanctions on the exchange rate depend on sanctions type, consistent with theory. Import restrictions are associated with an appreciation of the exchange rate and declining imports, in line with model-based predictions. The magnitude of the effect after one month—1.5%—is smaller than the movements we are observing in today's rouble. Moreover, we find that export restrictions are followed with a statistically significant exchange rate depreciation on the order of half a percent after one month, also consistent with theory. Trade embargoes restricting both exports and imports do not impact the exchange rate significantly, consistent with the prior that the effects of the two types of sanctions offset. Asset freezes are associated with an exchange rate depreciation proportional to the value of assets frozen, as posited by theory. The depreciation—almost 2% at its peak—persists up to 3 weeks.<sup>10</sup> Overall, our findings suggest that recent models of the effects of sanctions on the exchange rate do not just match developments in today's Russia but have broader applicability.

Our paper is related to three streams of literature. First are conceptual models of how sanctions work (see e.g. [Kaempfer and Lowenberg \(1988\)](#), [Eaton and Engers \(1992\)](#), [Eaton and Engers \(1999\)](#), [Lorenzoni and Werning \(2022\)](#), [Itskhoki and Mukhin \(2022\)](#)). Our related contribution is to test two recent theories of the effects of sanctions on the exchange rate using historical data.

Another stream in the literature examines the features of sanction policies. Two landmark studies here are [Hufbauer et al. \(2009\)](#) and [Hufbauer et al. \(2010\)](#). Other relevant studies include e.g. [Elliott and Hufbauer \(1999\)](#), [Clifton et al. \(2014\)](#), [Von Soest and Wahman \(2015\)](#), [Felbermayr et al. \(2020\)](#). Our paper adds to this by mobilizing new data on pre-1945 sanctions and illustrating their relevance to the case of present-day Russia.

Finally, an empirical literature attempts to estimate the international economic effects of sanctions, for instance on the direction of trade (e.g. [Haidar \(2017\)](#)), cross-border

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<sup>10</sup>In terms of statistical significance, the exchange rate effects of import restrictions, export restrictions and asset freezes are significant at the 6%, 5% and 10% levels of confidence, respectively.

financial flows (e.g. [Besedeš et al. \(2017\)](#)) and spillbacks onto the sanctioning country (e.g. [Besedeš et al. \(2021\)](#), [Crozet and Hinz \(2020\)](#)). Recent papers have examined international fallout from Russia’s invasion of Ukraine e.g. on global equity markets ([Federle et al. \(2022\)](#)), sovereign default ([Bianchi and Sosa-Padilla \(2022\)](#)), and inflows and outflows from Russian bank accounts ([Drott et al. \(2022\)](#)). Our paper focuses on the exchange rate, examining whether the significant international economic effects emphasised in earlier studies extend to other times and places.

Section 2 introduces our new database on 1914-1945 economic sanctions. Section 3 considers the empirical framework and testable hypotheses. Section 4 reviews the estimates, while Section 5 draws conclusions for research and policy.

## 2 A New Database on 1914-1945 Economic Sanctions

### 2.1 A Primer on the History of Economic Sanctions

The 1914-1945 period is well suited for shedding light on recent economic sanctions on Russia. Neither the period before 1914 nor that after 1945 are equally apposite, as we now explain.

Prior to World War I, the doctrine governing the use of sanctions was different. At that time, economic sanctions were subordinate to military policy in times of war and were intended mainly to reduce the economic strength of targeted states ([Kern \(2009\)](#)).<sup>11</sup> Laws of war were based on the “Rousseau-Portalis” doctrine— postulating that civilians could not be held responsible for the actions of their governments and private property should

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<sup>11</sup>There were some exemptions. In the 19th century there were signs that economic pressure could be used as a weapon short of war. European nations and the US used “pacific” i.e. peaceful, blockades (also known as “gunboat diplomacy”) to intimidate other, less powerful states, protect their citizens and property abroad and enforce debt repayments. These blockades involved deployment of a naval force by a country or coalition to interrupt commercial intercourse with ports or coasts of a state with which these countries were not at war. That demonstration of force was almost always sufficient to bend the target country to their will, and ships rarely had to use firepower. Pacific blockades occurred at least 22 times between 1827 and 1913. Almost without exception, the targeted countries were small ([Davis and Engerman \(2003\)](#)). Targeted countries included small nations in Europe and emerging nations in Latin America and Asia, such as Turkey in 1827; Portugal in 1831; the Netherlands in 1832–1833; Colombia in 1834; Panama in 1837; Mexico in 1838; Argentina in 1838–1840; San Salvador in 1842; Nicaragua in 1842 and again in 1844; Argentina in 1845–1850; Greece in 1850; Japan in 1853-1854, Sicily in 1860–1861; Brazil in 1862–1863; Bolivia in 1879; China in 1884–1885; Greece, again, in 1886; Zanzibar in 1888–1889; Siam in 1893; Greece, yet again, in 1897; and Venezuela in 1902–1903; see [Davis and Engerman \(2003\)](#), [Washburn \(1921a\)](#), [Washburn \(1921b\)](#), [Washburn \(1921c\)](#). Targeting countries included Austria, Britain, Chile, France, Germany, Italy, Russia and the United States.

remain inviolable in times of war (Mulder (2022)).<sup>12</sup> As a result, economic sanctions were mainly implemented through direct blockades of an enemy’s coastline and ports.<sup>13</sup>

Use of economic sanctions changed in early twentieth century as globalisation and advances in technology challenged traditional military techniques. Global trade and investment made it easier for enemy states to circumvent blockades by trading through neutral countries, while submarines and aerial warfare eroded the effectiveness of blockading ports and coastlines. As a result, the scope of economic sanctions increasingly extended beyond the actual area of combat, rendering it impossible for neutral states to remain insulated (see Kern (2009) and Doxey (1996)).

World War I was then a turning point. Economic sanctions started playing a defining role in the international order when the Allies embargoed the Central Powers (see Mulder (2022) and for detail Annex section A.3).<sup>14</sup> Estimates suggest that these sanctions were responsible for more civilian deaths than both aerial strikes and chemical weapons during the conflict.

The interwar period was one of deglobalization and fragmentation into regional blocs, suggesting comparisons with today’s events. Officials believed that tools used against the Central Powers could now be used against violators of the Versailles Treaty, the principal peace treaty signed after World War I. Economic sanctions were administered by the League of Nations, the predecessor to today’s United Nations. Article 16 of the Covenant of the League authorized collective economic and military action against a state resorting to war in disregard of the provisions requiring states to settle disputes peacefully. This was seen as a measure of dissuasion to preserve the international order. Although such sanctions were more easily wielded against small countries, large countries were also targeted, or at risk of being targeted.<sup>15</sup>

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<sup>12</sup>For instance in the Crimean war (1853-1856) Her Majesty’s Treasury fulfilled Britain’s financial obligations to Russia, just as Russia fulfilled its. Similarly, private property was not seized in the Italian wars of independence of 1848-1849, 1859 and 1866, nor in the German wars of unification of 1866 and 1870. A contrasting example is Bismarck’s Lombardverbot against Russian securities in 1887.

<sup>13</sup>A blockade is a military operation that blocks all maritime movement to or from a port or coasts.

<sup>14</sup>The Central Powers, also known as the Central Empires, were one of two main coalitions that fought in World War I; it included the German Empire, Austria-Hungary, the Ottoman Empire and the Kingdom of Bulgaria. They were also known as the Quadruple Alliance. The Allies or Entente Powers were the other main coalition led by France, the United Kingdom, Russia, Italy, Japan, and the United States.

<sup>15</sup>Specifically, Article 16 of the Covenant of the League of Nations stressed that “should any Member of the League resort to war. . . against all other Members of the League” it would be immediately subject to “the severance of all trade or financial relations. . . and the prevention of all financial, commercial or personal intercourse between the nationals of the covenant-breaking State and the nationals of any other

Sanctions adopted under the auspices of the League of Nations suffered however from lack of oversight and a failure to apply similar legal principles of liability. This changed during World War II. Decision making became more centralized amongst the Allied powers; this allowed for more effective policies targeting strategic supplies of the Axis powers and for the imposition of extra-territorial jurisdiction on third-country trade with targeted states.

Use of economic sanctions then increased dramatically after World War II (Davis and Engerman (2003)). This increase went hand in hand with a vast increase in the number of international agreements designed to protect civil, political and other human rights. Breaches served as a justification for the imposition of sanctions. In many instances, such sanctions were imposed unilaterally—frequently by the United States. Starting from the 1990s, they were also imposed multilaterally by international coalitions often led by the United States. Whether these cases are well suited for shedding light on current events is debatable, however. Between 1914 and 1945, sanctions were typically taken to disrupt military initiatives or as part of a broader war effort, similar to sanctions imposed on Russia following its invasion of Ukraine in February 2022. After 1945, in contrast, economic sanctions were applied in other contexts: of 1,101 cases between 1945 and 2021 documented in Felbermayr et al. (2020) and Kirikakha et al. (2021), almost half aimed to preserve democracy or human rights or other related goals. Almost 90% of sanctions targeted developing economies smaller than today’s Russia.<sup>16</sup> Moreover, post-World War II sanctions imposed on large emerging economies, such as China and Soviet Russia, hit socialist or planned economies whose structure is not well suited for testing the predictions of models based on the operation of market mechanisms.<sup>17</sup> Sanctions against large G7

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State, whether a Member of the League or not.” It further adds that “it shall be the duty of the Council [the predecessor to today’s Security Council of the United Nations] in such case to recommend to the several Governments concerned what effective military, naval or air force the Members of the League shall severally contribute to the armed forces to be used to protect the covenants of the League.” See *The Avalon Project*, Yale Law School, url: [https://avalon.law.yale.edu/20th\\_century/leagcov.asp](https://avalon.law.yale.edu/20th_century/leagcov.asp).

<sup>16</sup>Davis and Engerman observe that the GDP of the sender (or principal initiator) of sanctions was nearly always over ten times that of the target and in the majority of cases more than 50 times greater (Davis and Engerman (2003)). However, large advanced economies were also occasionally targeted, such as Australia, Austria, Canada, the European Economic Community, European Union, France, Germany, Italy, Japan, the Netherlands, New Zealand, Norway, Sweden, Switzerland, the United Kingdom, and the United States; more on this below.

<sup>17</sup>For example, 22 of the 24 sanction episodes against China took place before its accession to the World Trade Organization in 2001, including 7 cases after the Tiananmen Square protests of 1989. Almost half of sanctions against Russia occurred when it was still the USSR, while most of the remaining sanctions were taken after Russia invaded Crimea in 2014.

economies were imposed for reasons unrelated to war and did not feature the scope and scale of those imposed on today’s Russia.<sup>18</sup>

Not even Russia’s invasion of Crimea in 2014 is a clear-cut case. Although significant trade and financial sanctions were imposed, these were not accompanied by systematic sanctions affecting military equipment, inputs or assistance, unlike sanctions taken after Ukraine’s invasion.<sup>19</sup> Nor were the sanctions as intense.<sup>20</sup>

In sum, the intensity and scale of sanctions imposed on a country like today’s Russia is plausibly without precedent since World War II.

## 2.2 Data Construction

We start by compiling a list of economic sanctions from [Hufbauer et al. \(2009\)](#) and [Mulder \(2022\)](#). We identify features of these sanctions using primary, contemporary and secondary sources, such as the archives of the League of Nations, articles in contemporary newspapers and academic journals, and scholarly accounts (see [Appendix C](#) for details on the sources).

Our database contains 128 cases of sanctions imposed during 22 episodes between 1914 and 1945 ([Appendix C](#) provides a summary of the episodes). We have information on the country targeted; the country or coalition of countries imposing the sanctions; on whether the target country attacked a third country;<sup>21</sup> on whether sanctions were actually enforced or were only threatened; on whether cases were directly linked to war operations (or not, as in cases of sanctions imposed in response to strikes);<sup>22</sup> on whether

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<sup>18</sup>For instance, France was sanctioned by 9 countries in 1995-6 for resuming nuclear tests. The UK faced sanctions from Spain between 1966 and 1984 in the context of its territorial dispute over Gibraltar, as well as in 1982 from Argentina in the context of its territorial conflict over the Falkland (Malvinas) Islands.

<sup>19</sup>Within the G7, the US, Japan and Canada did not impose sanctions on sales of military equipment to Russia after its invasion of Crimea, although they imposed trade and/or financial sanctions.

<sup>20</sup>For instance, the freezing of the official reserve holdings in dollars and euros of the Central Bank of Russia was unprecedented for a country of this size, as was Russia’s “de-swifiting”—the suspension of access to messaging network services, such as SWIFT, essential to the global interbank payment system—of major commercial Russian banks. Moreover, the measures taken are designed as “smart sanction”—they are not intended to harm Russia as a whole but are targeted mostly at individuals, firms or banks with direct political or military ties with the intention to effectively thwart Russian abilities to continue the war.

<sup>21</sup>These are also useful cases to look at as parallels can be drawn with today’s Russia (i.e. sanctions were taken by the G7 and the EU against a target country (Russia) that invaded a third country (Ukraine)).

<sup>22</sup>These are still useful cases to consider as a way of disentangling the exchange rate effects of sanctions from those of war operations, especially when the latter exactly coincide with the former.

sanctions were introduced for the first time against a target country or, alternatively, whether their scale and/or intensity was increased or reduced.

We code the type of sanctions taken and the dates when they were introduced and lifted. [Itskhoki and Mukhin \(2022\)](#) argue that such timing is crucial for understanding the evolution of the rouble’s exchange rate against the dollar in the early phases of the Russian-Ukraine episode. They observe that initial sanctions imposed by the West, such as the freeze on the Central Bank of Russia’s foreign exchange reserves and threats of blocking Russian exports of gas and oil, weakened the rouble initially; but then that tougher sanctions on imports than exports, in the context of surging prices of oil and other commodities—of which Russia is a large exporter—contributed to the rouble’s subsequent recovery. Only precise dating and information on sanction type can distinguish the first response from the second.

We enumerate 6 types of sanctions: those involving a naval blockade or an embargo that broadly disrupts commercial relations; restrictions on imports of the target country;<sup>23</sup> restrictions on exports of the target country;<sup>24</sup> freezes of financial (bonds, equities, direct investments, bank deposits) and real (property) assets of the target country held in the sender country;<sup>25</sup> exclusion of the target country’s government or companies from the sender country’s capital markets; and arms embargoes.

[Table B.1](#) compares our data with other databases on sanctions. Most existing databases (e.g. [Kirikakha et al. \(2021\)](#), [Felbermayr et al. \(2020\)](#), [Clifton et al. \(2014\)](#), [Von Soest and Wahman \(2015\)](#)) focus on the post-1945 period. Our data cover the period prior to 1945. This is similarly true of the list of episodes of [Hufbauer et al. \(2010\)](#), albeit with three differences. First, we have a larger number of cases; second, we provide a classification and coding of sanctions by type; third, we offer more extensive coverage of pre-1945 cases involving asset freezes, to which earlier studies (such as [Hufbauer et al. \(2010\)](#) and [Mulder \(2022\)](#)) pay less attention. This last extension is important insofar as asset freezes play a role in current sanctions on Russia.

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<sup>23</sup>This was often a ban on imports of oil, steel or iron ore or selective restrictions on specific military equipment needed to support the target country’s military and productive capacity. There were also bans on consumer goods. See [Appendix C](#) for details.

<sup>24</sup>The aim was to reduce the target country’s ability to purchase needed supplies in global markets, while at the same time providing firms of the the sender country’s protection akin to a tariff.

<sup>25</sup>This consisted mainly of the asset freezes imposed by the US under the Trading with the Enemy Act of 1917, both during World War I and World War II; see below.

## 2.3 Stylized Facts

Figure A.2 puts countries that faced economic sanctions in World War I on a map featuring 1914 national borders. Black denotes sanctioned countries, light grey countries that were not sanctioned. The figure highlights the war blockade imposed by the Allies on the Central Powers (the German Empire, Austria-Hungary, the Ottoman Empire and the Kingdom of Bulgaria). That blockade essentially resulted in the merchant fleet of the Central Powers being banished from the oceans. International telegraph cables were also cut, further complicating overseas trade by these nations.

A similar map for the interwar period is shown in Figure 1. Besides sanctioned and non-sanctioned countries (again in black and light grey, respectively) the map shows countries that faced threats of sanctions (in dark grey shade)—typically at the initiative of the League of Nations. It makes clear that economic sanctions no longer centered on Europe but now extended to other continents. Many of these episodes involved disputes over national borders and territorial claims—unresolved or created by post-World War I peace settlements—resembling today’s Russia and Ukraine. Countries threatened by sanctions included Yugoslavia in its conflict with Albania in 1921; Turkey during the Greco-Turkish war of 1919-1922; Italy in the context of the Corfu Incident of 1923; Turkey in its dispute with Iraq and the UK over Mosul in 1925; Greece after the Incident at Petrich of 1925; the USSR in the context of the ARCOS Affair of 1927; Japan after the Mukden Incident and its invasion of Manchuria of 1931; Germany after the introduction of the first antisemitic laws of 1933; and the USSR in the Metro-Vickers Affair of 1933.<sup>26</sup> Countries experiencing actual economic sanctions included Germany during the occupation of the Ruhr in 1923-1925; Hong-Kong during the Canton-Hong-Kong General Strike of 1925; Bolivia and Paraguay during the Chaco War of 1932-1935; and Italy after its invasion of

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<sup>26</sup>Yugoslavia’s conflict with Albania of 1921 followed from Yugoslavia’s support for the establishment of the Republic of Mirdita (a short-lived unrecognized republic declared in northern Albania) in its efforts to obtain a more advantageous border demarcation. The Greco-Turkish war of 1919-1922 occurred after partitioning of the Ottoman Empire and Greece and Turkey’s conflicting territorial claims over Smyrna and Anatolia. The Corfu Incident was when Italy bombarded and occupied Greek Corfu. The Mosul question was a territorial dispute between Turkey and the United Kingdom (later Iraq) over possession of formerly Ottoman Mosul Vilayet. The Incident at Petrich was a Greek-Bulgarian dispute that resulted in a brief invasion of Bulgaria by Greece near the border town of Petrich in 1925. The ARCOS Affair involved the All-Russian Co-operative Society—the main body in charge of Anglo-Soviet trade — which British authorities accused of conducting subversive activities. The Mukden Incident was a false flag operation staged on 18 September 1931 by the Japanese army as a pretext for Japan’s invasion of Manchuria. The Metro-Vickers Affair was an international diplomatic crisis precipitated by the trial of British employees of Metropolitan-Vickers by the Soviet Union on charges of economic subversion and espionage. See Appendix C for more details.

Abyssinia in 1935-1937.<sup>27</sup> In several episodes (the Petrich Incident, the Mukden Incident, Abyssinia), a coalition of countries (often under the auspices of the League of Nations) imposed or threatened to impose sanctions against a country that had invaded a third country—much as G7 and EU countries did against Russia in 2022.



Figure 1: Countries sanctioned: 1919-1938.

**Notes:** The figure puts countries sanctioned during the interwar period on the map according to 1938's national borders. 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.

The map for World War II is shown in [Figure A.3](#). Blockades and other sanctions imposed on the Axis powers (Germany, Italy and Japan) and counter-blockades imposed on the UK (all shown in black) are visible. No fewer than 30 countries, including the Axis Powers, had assets in the US frozen by the Trading with the Enemy Act.

[Figure 2](#) compares the scale of sanctions over the 1914-1945 period with those after World War II. It shows the average share of global GDP (in percentages) across sanctioned countries between 1914 and 1945 (grey bars), 1945 and 2018 (blue bars) and of today's

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<sup>27</sup>The Occupation of the Ruhr was the military occupation of Germany's Ruhr region by France and Belgium between January 1923 and August 1925 in response to Germany defaulting on reparation payments foreseen by the Treaty of Versailles. The Canton-Hong Kong strike was a strike and boycott in British Hong Kong and Guangzhou (Canton) from June 1925 to October 1926 after a shooting of Chinese protesters which led to an anti-British boycott. The Chaco War was a conflict between Bolivia and Paraguay over the control of the northern part of the Gran Chaco region thought to be rich in oil. The Italo-Ethiopian War was a war of aggression between Italy and the Ethiopian Empire (also known as Abyssinia) from October 1935 to February 1937, ending with Italy's occupation of Ethiopia. See [Appendix C](#) for more details.

Russia (red bar), respectively.<sup>28</sup>

Countries facing economic sanctions during World War I and the interwar period were of a size comparable to today’s Russia—about 3% of global GDP. Countries facing economic sanctions after World War II were 10 times smaller on average, accounting for about 0.3% of global GDP.<sup>29</sup> This underscores that the breadth and scope of sanctions taken against a country of such systemic importance as Russia is essentially unprecedented since World War II.<sup>30</sup>

Figure A.4 scales sanctions instead by global trade. The result is similar: countries facing economic sanctions during World War I and the interwar period accounted for similar shares of global trade as today’s Russia (about 2-3% on average).<sup>31</sup> Countries targeted after World War II were an order of magnitude smaller —accounting on average for about 0.2% of global trade.<sup>32</sup>

Figure 3 and Figure A.5 complement the picture, showing the evolution of the share of global GDP and global trade (in percentages) of countries sanctioned between 1914 and 2018/9. For the 1914-1945 period, the dark grey bars correspond to the share of countries targeted by actual sanctions; the light grey bars to the share of countries so threatened. For the period 1945-2018/9, the light grey line corresponds to sanctions taken from the Global Sanctions Database (Felbermayr et al. (2020) and Kirikakha et al. (2021)); the dark grey bars show filtered cases that are closest to the spirit of today’s sanctions on Russia.<sup>33</sup> The pictures make clear that the end of World War II was a turning point. The

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<sup>28</sup>GDP shares were estimated using data in USD 2011 from the Maddison Project (de Pleijt and van Zanden (2020)). Linearly interpolated observations or observations for the closest available years were used when GDP data were missing, typically for reasons related to war. Post-1945 cases were taken from the Global Sanctions Database (Felbermayr et al. (2020) and Kirikakha et al. (2021)).

<sup>29</sup>The dark blue bar corresponds to all cases, the light blue bar to cases where (i) the objective was to “end war”, “prevent war”, or “territorial conflict” and (ii) sanction measures targeted military weaponry and trade or finance. This filter removes cases where the objective of sanctions was preserving democracy, protecting human rights, engineering policy changes or other similar goals by focusing on cases where sanctions targeted military weapons and international trade or finance, much like those on today’s Russia.

<sup>30</sup>One dimension not taken into account by this measure is the breadth of the sanctions. Although on average economies smaller than Russia were targeted after 1945, the share of economic activity targeted in the countries in question was in some cases larger than the “smart” sanctions currently imposed on Russia. In addition, larger economies may have better outside options for circumventing sanctions.

<sup>31</sup>Trade shares were estimated using historical data from the RICardo Project (Dedinger and Girard (2017)) for the period 1914-1938 and from the International Monetary Fund’s Direction of Trade Statistics database for the period 1945-2019.

<sup>32</sup>The countries in question are defined in the same way as above.

<sup>33</sup>These cases are restricted to those 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.

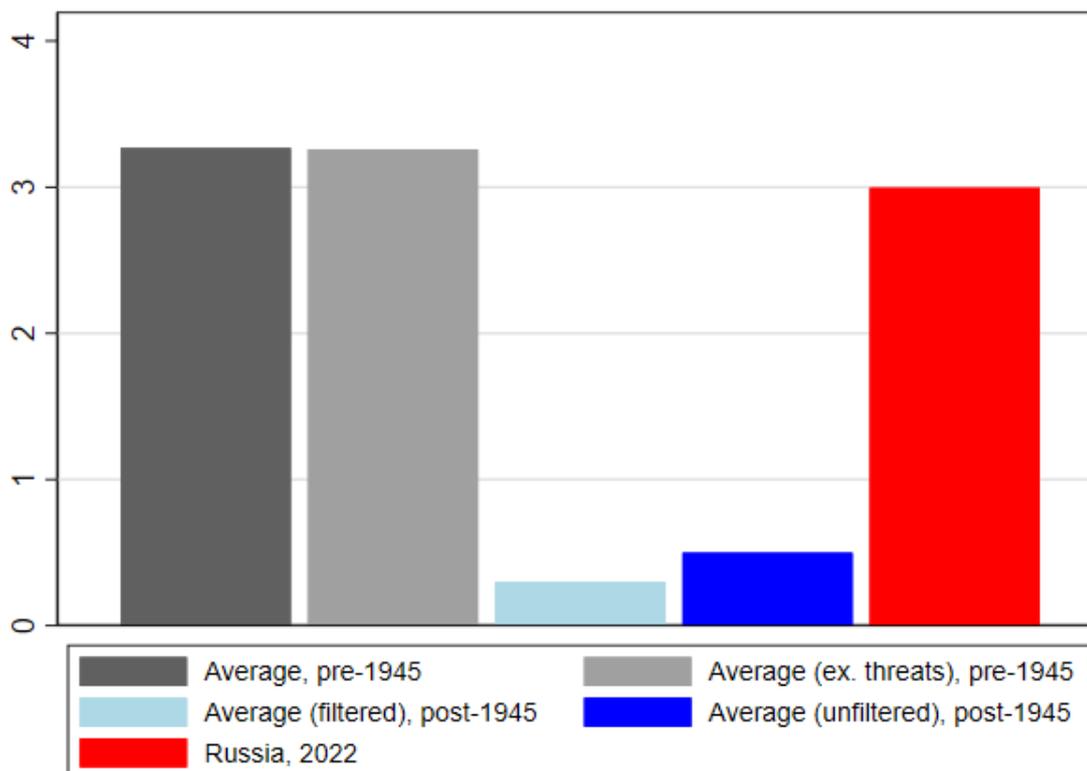


Figure 2: Average share of global GDP across sanctioned countries in selected periods. **Notes:** The figure shows the average share of global GDP (in percentages) across sanctioned countries between 1914 and 1945 (grey bars), 1945 and 2018 (blue bars) and of today’s Russia (red bar), respectively. GDP shares were estimated using historical GDP data in USD 2011 taken from the Maddison Project database (de Pleijt and van Zanden (2020)). Linear interpolated observations or observations for the closest years available were used when GDP data were missing from the database. Post-1945 cases of sanctions were taken from the Global Sanctions Database (Felbermayr et al. (2020) and Kirikakha et al. (2021)). The dark blue bar corresponds to all cases. The light blue bar to cases restricted to those 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—in the spirit of today’s sanctions on Russia.

scale of sanctions relative to global GDP or trade was large if one considers all sanction cases after 1945 (the light grey line). But these include a large number of cases where sanctions were imposed for reasons completely different from those motivating sanctions on today’s Russia. When focusing instead on cases that are close analogues (the dark grey bars), the contrast is striking. The breadth and scale of economic sanctions against today’s Russia is closer to pre-1945 than post-1945 patterns.

Finally, Figure A.6 breaks down 1914-1945 sanctions by type, distinguishing trade embargoes, import restrictions, export restrictions, asset freezes, exclusion from financial markets, and embargoes on arms. In total, there are 128 cases, of which asset freezes were

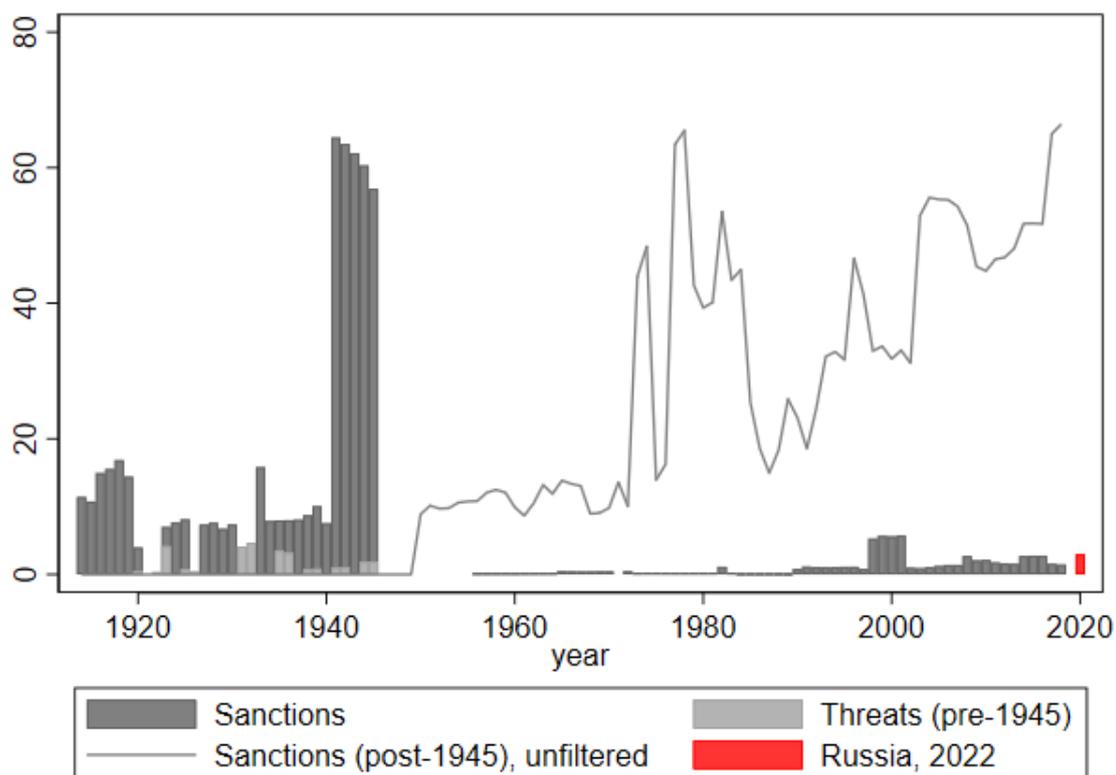


Figure 3: Share of global GDP under sanctions: 1914-2018.

**Notes:** The figure shows the evolution of the share of global GDP (in percentages) of countries sanctioned between 1914 and 2018. For the 1914-1945 period, the dark grey bars correspond to the share of countries targeted by actual sanctions; the light grey bars to the share of countries threatened by sanctions. Two estimates are shown for the period 1945-2018. The light grey line corresponds to all cases of sanctions taken from the Global Sanctions Database (Felbermayr et al. (2020) and Kirikakha et al. (2021)); the dark grey bars to cases restricted to those 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—in the spirit of today’s sanctions on Russia. GDP shares are estimated using historical GDP data in USD 2011 taken from the Maddison Project database (de Pleijt and van Zanden (2020)). Linear interpolated observations or observations for the closest years available were used when GDP data were missing from the Maddison Project database.

the most common type, with 38 cases, followed by import restrictions (32 cases), export restrictions (18 cases) and general naval trade embargoes (16 cases). There were 2 cases of financial market exclusion (Bolshevik Russia in 1918-1920 and Italy in 1935-1936).<sup>34</sup>

<sup>34</sup>Since there are so few cases we do not try to obtain empirical estimates of the exchange rate effects of financial market exclusions below. We do not examine cases of arms embargoes either because theory provides no guidance on their predicted exchange rate effects.

## 3 Empirical Framework and Hypotheses

### 3.1 Empirical Framework

To test the predictions of recent theoretical models, we estimate the impact of sanctions on the exchange rate using a panel local projections methodology following [Jordà \(2005\)](#) and [Jordà and Taylor \(2016\)](#). We obtain OLS estimates for each horizon  $k \in [0, K]$  of the following model:

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

where  $s_{i,t}$  is the natural logarithm of  $1 +$  the exchange rate of country  $i$  in week  $t$  defined as the number of currency  $i$  units per unit of US dollar.<sup>35</sup> We use the US dollar as numéraire instead of sterling because this allows us to keep the UK in our sample.<sup>36</sup> Direct exchange rate quotes of the currency of targeted countries against those of the targeting countries are not systematically available.<sup>37</sup> Moreover,  $\alpha_i$  are currency fixed effects, and  $\alpha_t$  are year fixed-effects and week fixed-effects, respectively. The  $\beta_k^j$  coefficients capture the dynamic response up to horizon  $k$  of the exchange rate of country  $i$  to the introduction of sanctions of type  $j$  in week  $t$ . The error term  $\varepsilon_{i,t+k}$  is robust to autocorrelation and heteroskedasticity.

We mainly use data from [Vicquéry \(2022\)](#) for our dependent variable  $s_{i,t}$ . [Vicquéry \(2022\)](#) digitized printed sources on the London foreign-exchange market in peacetime over two centuries. Weekly quotes for more than 40 currencies are available for the interwar period. Moreover, we improve existing historical data for the period by digitising weekly quotes on the Swiss foreign-exchange market, which is better suited than London or New York to observe the black market quotes in the 1930s and World War II. We complement our original data with data from a commercial provider, Global Financial Data (GFD)<sup>38</sup>. [Appendix D](#) provides details on the data sources for each polity in the sample by sub-

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<sup>35</sup>An increase in  $s_i$  therefore means that the exchange rate of currency  $i$  depreciates vis-à-vis the US dollar.

<sup>36</sup>The UK was both a targeting and targeted country in this earlier era.

<sup>37</sup>Exchange rates quotes are available against a few liquid currencies, including the US dollar, sterling, Swiss franc, etc. Since we have limited data on the dependant variable, we cannot estimate [Equation \(1\)](#) on a dyadic panel of observations.

<sup>38</sup>Data provided by Global Financial Data lack information on the sources used, even though they likely refer to the New York market. They typically do not take into account parallel markets arising from capital controls and do not cover black markets.

period. In a nutshell, we rely use Global Financial as the baseline data source for World War I as coverage of our Swiss market data remains limited.<sup>39</sup> For the interwar period, we mainly use London market data from [Vicqu ery \(2022\)](#) together with quotes from Global Financial Data—for additional currencies—and original Swiss market quotes—for countries experiencing strict capital controls. For World War II, we use Swiss market data, including black market quotes whenever available, complemented with quotes from Global Financial Data. The resulting sample provides observations between January 1914 and September 1944 (when Swiss black foreign-exchange quotes stops being available). We winsorize the data at the 1% level to deal with potential outliers and measurement errors.

$Sanction_{i,t}^j$  is a binary dummy variable equaling 1 in the week when a sanction of type  $j$  is taken against target country  $i$  and 0 otherwise, where  $j$  indicates either an import or export restriction, trade embargo, asset freeze, or exclusion from financial markets.

Along with sanctions, adverse events associated with wars, battlefield operations and other geopolitical tensions could have conceivably affected the exchange rate. We therefore include in  $X_{i,t}$  two binary dummies which equal 1 in weeks when sanctions coincide with the outbreak of war or its ending, and 0 otherwise.

In robustness checks, we include in  $X_{i,t}$  the monthly index of geopolitical risk of [Caldara and Iacoviello \(2022\)](#), which is available for the full sample. We include the measure of financial openness of [Quinn and Voth \(2008\)](#) and [Quinn and Toyoda \(2008\)](#) to control for the presence of restrictions on capital outflows and inflows by residents and nonresidents in country  $i$  and year  $t$ , which is available for the period 1914-1931. We control for trade openness, since the impact of sanctions on imports and exports might depend on the importance of international trade for the economy of the targeted nation.<sup>40</sup> We control for tariffs, since their impact on exports and imports is analogous to that of trade restrictive sanctions using annual panel data on the share of customs revenues (import duties) on import values from [Clemens and Williamson \(2004\)](#).<sup>41</sup> We add month fixed effects and country-year ( $\alpha_i \times \alpha_t$ ) fixed effects as alternatives to our

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<sup>39</sup>We use the Swiss market data available for World War I in robustness checks below.

<sup>40</sup>We compute trade openness as the sum of imports and exports scaled by GDP taking data from [de Pleijt and van Zanden \(2020\)](#) and the RICardo project database [Dedinger and Girard \(2017\)](#). We used the last observations available when data were missing.

<sup>41</sup>Tariffs increased globally in the wake of the Great Depression and the adoption by US Congress of Smoot-Hawley legislation in June 1930.

baseline specification which includes separate currency, year and week fixed-effects.<sup>42</sup> This provides multiple approaches to controlling for unobserved heterogeneity. We exclude sanctions taken by the League of Nations to examine whether their impact differs from sanctions taken by individual countries. We exclude threats of sanctions to restrict our estimates to actual sanctions. We obtain estimates for a restricted sample of currencies neither on gold nor within currency blocs for the interwar period. We use an alternative data set where black market exchange rate quotes on the Swiss market, when available, are used for World War I. And we obtain estimates controlling for the fiscal balance-to-GDP ratio with a view to capturing fiscal episodes leading to monetisation and exchange rate effects unrelated to sanctions.

Our sample period is one when currencies were often on a commodity-backed standard or subject to capital controls.

Figure A.7 below counts the number of countries on the gold standard and in currency blocs during our period of interest, taking data from Reinhart and [Reinhart and Rogoff \(2011\)](#) and [Eichengreen and Irwin \(1995\)](#). The figure shows that exchange rates were often heavily managed in the earlier era we examine. Around half of the sample was pegged to gold prior to World War I. The gold standard was suspended during the war, but countries returned to gold gradually thereafter— including the UK in 1925. Half of the sample was back on gold by the early 1930s, shortly before the UK and the US suspended convertibility of their respective currencies in the yellow metal in the wake of the Great Depression. A few countries, led by France, stuck to gold until 1936, while other countries attempted to stabilize their currencies against the pound sterling, the US dollar and the Reichsmark in what came to be known as the sterling, dollar bloc and Reichsmark blocs. France’s devaluation of 1936 marked the end of the gold standard. Currencies not on gold or in currency blocs were not necessarily fully floating. Some (like China’s yuan) were on a silver standard while others (like the Yugoslav dinar, Italian lira and Turkish lira) were at times subject to capital controls, as were several currencies during World War I and most currencies during World War II.

Our estimates, however, remain informative for the following reasons. First, they provide insights on the mechanism. Management of exchange rates may reduce the magnitude of the estimates, but we can still examine whether the exchange rate reacts in

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<sup>42</sup>We do not consider country-week fixed effects, since they would be correlated with our sanction variables.

the direction predicted by theory and whether the transmission channels posited are at play. Second, whenever capital controls spurred development of black markets, we rely on “free”—in lieu of official—exchange rate quotes. This concerns several countries in the second half of the 1930s and a large share of the Swiss foreign-exchange market in World War II. Third, even under the gold standard there was scope for some exchange rate flexibility against the dollar and other major currencies within the gold import and export points; gold point violations sometimes persisted for long periods (Clark (1984)).<sup>43</sup> Interestingly, realised exchange rate volatility – measured as annualised 1-week logarithmic returns against the US dollar – was between 1914-1944 of a similar order of magnitude and at times even notably larger compared to now (see Figure A.8 below). Fourth, one reason why volatility in the rouble exchange rate was so large after Russia was hit by sanctions in 2022 is that the Central Bank of Russia (CBR) could no longer intervene in the foreign exchange market due to the freezing of Russia’s official foreign exchange reserves. Had the CBR intervened to lean against the effects of sanctions – as central banks of the earlier era could – the response of the rouble might have been more contained.

### 3.2 Hypotheses

Itskhoki and Mukhin (2022) predict that export sanctions lead to depreciation of the currency of the target country  $i$ . This depreciation results from the reduction in the international purchasing power of the target country due to a reduction in the value of exports, which is the source of supply of foreign currency.<sup>44</sup> Since a lower supply of foreign exchange increases the value of the foreign currency and weakens the exchange rate, we expect  $\beta_k^j > 0$  if  $j =$  export restrictions in Equation (1).

Sanctions on imports have the opposite effect, since they make foreign currency more abundant. Itskhoki and Mukhin (2022) predict that rationing imports reduces spending on imports and hence the demand for foreign currency. If exports remain stable, the exchange rate appreciates in order to bring the foreign exchange market into equilibrium. This appreciation results in substitution from desired but sanctioned import varieties

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<sup>43</sup>Market exchange rates could fluctuate about official exchange rates within variable bands determined by the costs of shipping gold; the limits of those bands, at which it became profitable to ship gold between countries, were known as the gold points.

<sup>44</sup>The assumption is that exports are invoiced in foreign currency, in line with local or dominant currency pricing—these being conventional assumptions. This makes sense for Russia, which mainly exports commodities denominated in dollars.

toward less desired import varieties that are neither rationed nor demanded unless a stronger exchange rate brings down their relative price.<sup>45</sup> A related channel emphasized in [Lorenzoni and Werning \(2022\)](#) suggests that consumers in the target country will substitute from domestic varieties for desired but sanctioned import varieties. This raises the relative price of domestic goods, leading to real exchange rate appreciation. We would expect  $\beta_k^j < 0$  if  $j =$  import restrictions in [Equation \(1\)](#).

Foreign asset freezes or exclusion from financial markets weaken the exchange rate, similar to export restrictions. A foreign asset freeze makes foreign currency scarcer. Financial autarky means that the supply of foreign currency is limited by export revenues, which makes for exchange rate depreciation.<sup>46</sup> Hence, we would expect  $\beta_k^j > 0$  if  $j =$  foreign asset freeze or exclusion from financial markets in [Equation \(1\)](#), and the depreciation of the exchange rate to be commensurate to the value of assets frozen.

### 3.3 Mechanisms

In the next step, we analyse the economic mechanisms through which sanctions affect the exchange rate by obtaining OLS estimates of the following model:

$$y_{i,\tau}^l - y_{i,\tau-1}^l = \alpha_i + \alpha_\tau + \beta^j \text{Sanction}_{i,\tau-1}^j + \Gamma' X_{i,\tau-1} + \varepsilon_{i,\tau} \quad (2)$$

where  $y_{i,t}^l$  stands for the natural logarithm of macroeconomic variable  $l$  in country  $i$  in year  $\tau$  predicted by theory as a channel of transmission of economic sanction shocks. Notice the change in the frequency of the observations from weekly to annual, since most macroeconomic variables are not observed weekly. The remaining variables in [Equation \(2\)](#) are similar as those of [Equation \(1\)](#). Data on several variables relevant to the impact of sanctions on the exchange rate, such as the supply and demand of foreign currency, prices of foreign tradables, prices of domestic nontradables, etc. are not available for our sample period.<sup>47</sup> We take annual data on exports and imports in US dollars (at constant 1913 exchange rates) from [Federico and Tena-Junguito \(2019\)](#) to measure  $y_{i,t}^l$ , which are available between 1914 and 1938 for most countries. Higher frequency data on

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<sup>45</sup>This in turn reestablishes intertemporal trade balance, i.e. it satisfies the country's budget constraint.

<sup>46</sup>Financial autarky requires foreign currency revenues from exports to be sufficient both to buy imports and satisfy domestic households demand for safe assets (if the domestic currency is unstable).

<sup>47</sup>For instance, changes in official foreign exchange reserves would capture changes to the net supply of foreign currency stemming from official sources, not private sources.

external trade were available from e.g. [Albers \(2018\)](#), [Ellison et al. \(2020\)](#) and [Mitchener et al.](#); however, the overlap with our sample of countries is limited. We would expect  $\beta^j < 0$  if  $l = \text{exports}$  and  $\beta^j > 0$  if  $l = \text{imports}$  in [Equation \(2\)](#).

We also make use of a survey conducted by the US Treasury in 1941 on foreign-owned assets in the United States ([US Treasury Department \(1945\)](#)). The purpose of this survey was to gather information for enforcing decisions by US authorities to freeze the assets of the Axis powers and other continental European countries. The data provide information on the value (in \$ million) of foreign-owned assets in the US, by countries of reported address of the owner, and by principal types of asset, as of 14 June 1941.<sup>48</sup> We test whether the 1-month depreciation of the exchange rate of countries targeted by the US is positively associated with the value of assets frozen (scaled by GDP), as predicted by theory. In other words, we estimate cross-sectional OLS estimates of the model equation:

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

where  $t_0$  is the time of the asset freeze,  $(W/Y)_i$  is country  $i$ 's total assets, debt securities or money scaled by domestic GDP.

## 4 Preliminary Estimates

### 4.1 Basic Estimates

[Figure A.9](#) shows exchange rate developments around selected sanction episodes. It plots the exchange rate (shown as solid black lines) 12 weeks before and 12 weeks after the imposition of sanctions (shown as red vertical lines). In some cases, the exchange rate depreciates after sanctions are imposed; in other cases, it appreciates; and in still other cases it remains flat. This underscores the importance of conditioning the impact on type of sanctions in order to identify their effect on the exchange rate, in line with theory.

[Figure 4](#) therefore shows our preliminary estimates for the full sample. The figure displays the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left

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<sup>48</sup>The assets in question include bullion, currency and deposits; domestic securities; real property; interest in estates and trusts; foreign controlled enterprises; and other assets.

panel). Positive values indicate that the exchange rate depreciates vis-à-vis the dollar. Local projections are obtained by OLS over the period 1914-1945; these control for year fixed effects, week fixed effects, and currency fixed effects. The dashed (dotted) lines are one (1.65) standard deviation confidence bands.

Import restrictions are associated with an appreciation of the targeted country's exchange rate, in line with theory: restricting imports makes foreign currency relatively more abundant, as in the model of [Itskhoki and Mukhin \(2022\)](#), or leads to a substitution from desired but sanctioned import varieties towards other but less desired varieties, as in the model of [Lorenzoni and Werning \(2022\)](#), where both mechanisms lead to a stronger exchange rate to restore equilibrium. The appreciation is in the order of 1.5% after 4 weeks and statistically significant at the 6% level of confidence.

In contrast, export restrictions lead to an exchange-rate depreciation, consistent with the theoretical prediction according to which such export restrictions reduce the supply of foreign currency and thereby weaken the exchange rate. The economic magnitude of the response of the exchange rate, at half a percent after one month, is smaller than in the case of import restrictions and statistically significant at the 5% level of confidence.

The response of the exchange rate to trade embargoes is insignificantly different from zero. Insofar as trade embargoes limit both imports and exports, the two effects should offset, as they do.

The response of the exchange rate to asset freezes is a significant depreciation, which sits well with predictions that asset freezes make foreign currency scarce and weaken the exchange rate. The depreciation is in the order of almost 2% at its peak and persists until 3-4 weeks (depending on the significance level considered).

## 4.2 Robustness

In robustness checks, we control for geopolitical risk using the measure of [Caldara and Iacoviello \(2022\)](#) in [Figure A.10](#), to control for geopolitical tensions that could have affected the exchange rate. The estimated exchange rate impact of import restrictions, export restrictions, trade embargoes and asset freezes is unchanged. Next we control in [Figure A.11](#) for restrictions on capital outflows and inflows by residents and nonresidents, which might have affected the response of the exchange rate. We use the financial openness measure of [Quinn and Voth \(2008\)](#) and [Quinn and Toyoda \(2008\)](#) over the limited

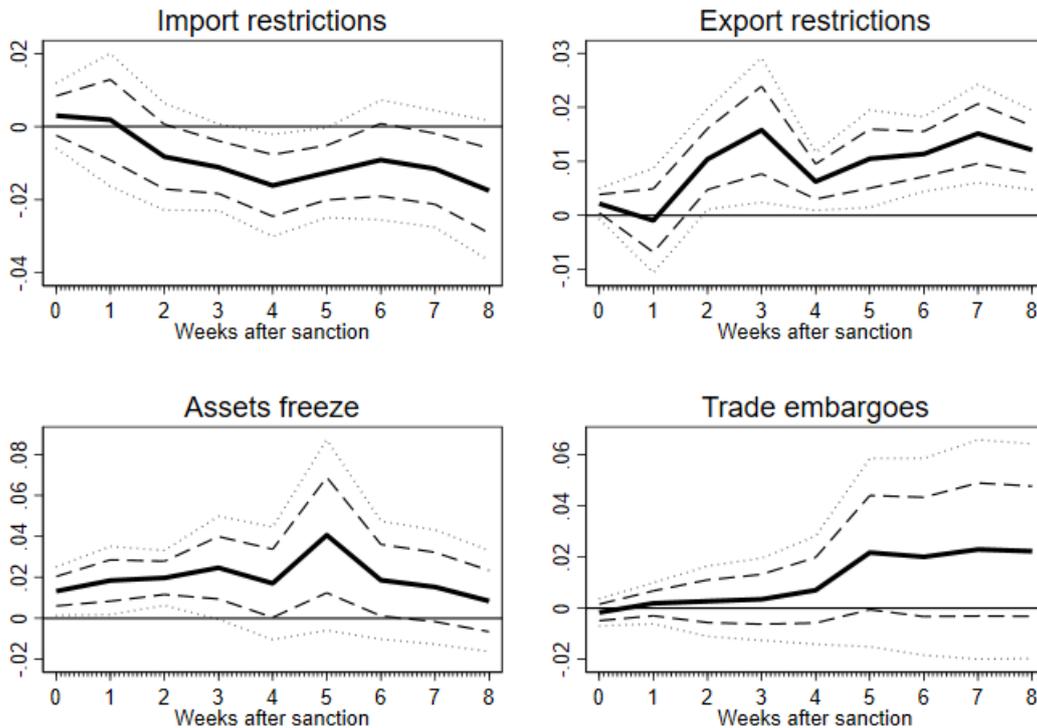


Figure 4: Basic estimates.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945); they control 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.

period (1914-1931) for which the measure is available. The results are again close to our basic findings. The estimates remain also broadly unchanged when controlling for trade openness, as in [Figure A.12](#), although the effect of import sanctions is slightly more imprecisely estimated. It is not surprising that trade openness absorbs much of the effect of the sanctions in question, since these work through import volumes. Controlling for trade tariffs does not affect our basic findings, though the estimated effect of import sanctions is again less precise; see [Figure A.13](#). It is understandably difficult to disentangle the effects of import sanctions from those of import tariffs, which both affect imports negatively and may lead to similar observed exchange rate effects.

Next we obtain estimates with month fixed effects (in [Figure A.14](#)) and with country-year ( $\alpha_i \times \alpha_t$ ) fixed effects (in [Figure A.15](#)) in place of separate currency fixed effects

and year fixed effects as alternative approaches to control for unobserved heterogeneity. The results are very close to our basic estimates with month fixed effects. The estimates are more imprecise for import and export restrictions with country-year fixed effects, possibly because the specification is demanding, given that the model is now saturated with a large set of estimated fixed effects.

We exclude in [Figure A.16](#) sanction threats to restrict our estimates to actual sanctions, and we exclude in [Figure A.17](#) sanctions taken by the League of Nations to examine whether their impact differs from sanctions taken by individual countries. In both cases our main results are unaltered.

We then obtain estimates of the exchange rate effect of sanctions for a restricted sample of currencies neither on gold nor within currency blocs for the interwar period. The estimates, shown in [Figure A.18](#) below, are close to the baseline estimates, which suggests that the latter are largely driven by these currencies.

We use an alternative data set where Swiss market foreign-exchange quotes, whenever available, are used for World War I. Our results are unaffected, as [Figure A.19](#) shows.

Next we obtain estimates controlling for the fiscal balance-to-GDP ratio with a view to capturing fiscal episodes potentially leading to monetisation and exchange rate effects unrelated to sanctions. We construct fiscal-balance-to-GDP ratios from [Mauro, Paolo and Romeu, Rafael and Binder, Ariel J. and Zaman, Asad \(2015\)](#). The estimates are in [Table B.3](#). Owing to limited availability of fiscal data, we lose 40% of the sample. But we continue to find that import restrictions are followed by exchange rate appreciations and export restrictions by depreciations after one month, in line with our basic estimates. The coefficient estimates are no longer statistically significant, which presumably reflects the smaller sample. We find that asset freezes are followed by a significant exchange rate depreciation after 1 week and no significant exchange rate response following trade embargoes, in line with our basic estimates.

Finally, we estimate the effects of export restrictions and import restrictions when they are included jointly in a regression in [Figure A.20](#).<sup>49</sup> The estimates are consistent with theory: the exchange rate appreciates following import restrictions, while it depreciates

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<sup>49</sup>Export restrictions and import restrictions are included individually in the basic regressions owing to potential multicollinearity: the imposition of export restrictions often coincides with import restrictions – i.e. in three-quarters of the cases considered – whereas the imposition of import restrictions does not necessarily coincide with export restrictions. This could make the effect of export restrictions harder to identify than the effect of import restrictions.

following export restrictions.

Sceptics could argue that our results might still be confounded by anticipation effects. Foreign exchange traders might have priced in sanctions before they were officially announced due to rumours, market speculation or leaks. At the same time, there may have been significant uncertainty during that period whether the conflict that could trigger sanctions would actually materialize. Moreover, there may have been large uncertainty ahead of any sanction decision as to whether market participants might have been able to anticipate all details of sanction measures until negotiations about their perimeter and parameters were finalised and measures announced. In fact, there was even significant uncertainty about whether sanctions would be required or not.<sup>50</sup> It is important therefore that narrative evidence suggests that sanctions taken at the beginning of World War I came as a surprise to market participants because their scope and intensity deviated sizeably from past practices among nations in conflict throughout the nineteenth century,<sup>51</sup> much as the initial sanction package taken against Russia surprised markets.<sup>52</sup>

We conducted an event study to detect potential exchange rate trends, which would point to anticipation effects prior to the announcement of sanction measures. [Figure A.21](#) below shows the estimated exchange rate change in weeks around sanction events in the spirit of [Freyaldenhoven et al. \(2019\)](#). The figure shows no statistically significant trends in exchange rate changes prior to announcement of sanctions (in week 0 of each panel)

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<sup>50</sup>One example is the Mosul dispute: the risk that the Mosul dispute would be elevated to the League of Nations was already raised in the course of 1924. At the same time, the alternative that a lasting settlement could be found without the need to resort to the League of Nations was still seen as an equally, if not more likely, option (see for instance the *New York Times* article entitled “The League and Mosul” published on October 29th, 1924); The weeks following the assassination of Archduke Franz Ferdinand in end-June 1914 provide another example: speculation mounted in the press that a war—and associated blockades—were imminent. At the same time, there were other articles arguing that the outbreak of war was unlikely. Moreover, articles discussing the likelihood of a war were focused on the war itself rather than any potential secondary effects such as sanctions. Discussions on potential blockades were limited and at most mentioned without detail (see for instance the press reports in *Der Bund* (a Swiss newspaper) in July-early August 1914, e.g. on July 31st (volume 65, number 352) some articles talked about the risks of a full out war with France (“In France” / “In Frankreich”), while others discussed the likelihood of a peaceful outcome (“Peaceful voices from Paris” / “Friedliche stimmen aus Paris”).

<sup>51</sup>For instance, the day prior to the tightening of the naval blockade on August 20th, *Der Bund* published an article explaining which measures were allowed under a naval blockade according to the London Declaration of 1909. The subsequent day, the Allied forces decided to go beyond what the London Declaration allowed hitherto. In line with this, press reports point to surprising confiscations/blockades of food shipments (for instance on August 21st a German ship with 7,000 tons of rice and 100,000 tons of wheat was blocked at Gibraltar, an act not in line with the London Declaration of 1909).

<sup>52</sup>While there were some expectations of limited sanctions against Russia and Russian individuals in case of an invasion by Russia into Ukraine, there was limited detailed discussion on the type of sanctions nor were there expectations that the sanctions would take the magnitude they did (in part because a full invasion of Ukraine by Russia was not considered the most likely scenario prior to end February 2022).

in most cases, though export restrictions might be a borderline case. This suggests that our findings for import restrictions, asset freezes and trade embargoes are not biased by anticipation effects.

### 4.3 Mechanisms

Next we analyze mechanisms through which sanctions affect the exchange rate by examining their impact on macroeconomic variables plausibly acting as transmission channels.

Figure A.22 shows the contemporaneous effect of import restrictions (dark grey bars) and embargoes (light grey bars) on the total imports of country  $i$  in year  $t$ . The baseline estimates of the left-hand side panel are obtained by OLS for the period 1914-1938. These control for year fixed effects, currency fixed effects, and dummies for war outbreaks and endings. The estimates of the middle panel for the same sample period control for currency fixed effects, dummies for war outbreaks and endings, and geopolitical risk. The estimates in the right-hand panel are for 1914-1931 and control for year fixed effects, currency fixed effects, dummies for war outbreaks and endings, and the financial openness measure of Quinn and Voth (2008) and Quinn and Toyoda (2008). 90% confidence intervals are shown as whiskers.

The baseline estimates and estimates controlling for geopolitical risk are consistent with the theoretical mechanisms in Itskhoki and Mukhin (2022) and Lorenzoni and Werning (2022). Import restrictions on a country lead to a fall in imports, which makes foreign currency more abundant and encourages substitution from desired but sanctioned import varieties towards less desirable domestic varieties. Both mechanisms lead to a stronger exchange rate as needed to restore equilibrium. The estimated effects are significant only at the 20% level of confidence, however. Sanctions have no effect on imports if we control for financial openness, but the estimates are obtained using only half of the sample and are therefore less reliable.

The effects of export restrictions and embargoes on total exports shown in Figure A.23 are mostly insignificant as well. It may be that exports do not react as predicted by theory. Yet another interpretation is that the effect of export sanctions on total exports is confounded by trade diversion. Exports from the target country to non-sanctioning countries might rise and offset falls in exports to sanctioning countries. This resonates with today's Russia—Russian oil sales (at premium prices) to China and India have

increased in parallel to declining exports to EU countries, which have tried to reduce their dependence on Russian oil and gas.

Finally we examine whether the extent of the exchange rate depreciation that follows asset freezes is positively associated with the value of assets frozen, as posited by theory. [Figure 5](#) shows cross-sectional OLS estimates of 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 the survey conducted by the US Treasury in 1941 ([US Treasury Department \(1945\)](#)). The left-hand bar shows the estimate with total assets (money, securities, real property, estates and trusts, foreign direct investments and other assets) scaled by domestic GDP; the middle bar the estimate with securities (money market instruments, bonds and equities) scaled by domestic GDP; and the right-hand side bar the estimate with money (bullion, currency and deposits) scaled by domestic GDP. 90% confidence intervals are shown as whiskers. Larger values of assets frozen are associated with a stronger exchange rate depreciation, in line with theory. The sample is small (just 12 observations) due to limited data availability, but the estimates are highly significant and explain around 80% of the variance in exchange rate responses (see [Table B.5](#)). The basic estimate with total assets suggests that the magnitude of the depreciation moves one-to-one with the value of assets frozen.<sup>53</sup> Estimates for more specific asset categories (securities and money) point to even stronger effects.

## 5 Conclusion

We provide the first test of the predictions of recent theoretical studies of the impact of sanctions on the exchange rate. This involved building a database of exchange rates and sanctions spanning 1914-1945 when large as well as small economies were targeted, facilitating comparisons with today's Russia-Ukraine war episode. We estimated the dynamic response of the exchange rate in a panel of sanction episodes at weekly frequency using local projections, conditioning on the type of sanctions taken. We then examined mechanisms through which sanctions affect the exchange rate by estimating their effects on macroeconomic variables plausibly acting as transmission channels.

Our estimates suggest that import restrictions, export restrictions, trade embargoes

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<sup>53</sup>In other words, a 1 percentage of GDP increase in the value of assets frozen leads to a 1% stronger depreciation.

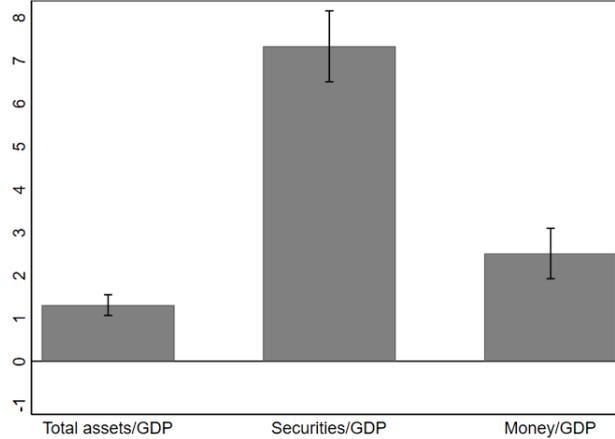


Figure 5: Transmission channels—Assets freeze.

**Notes:** The figure shows cross-sectional OLS estimates of Equation (3) 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 (US Treasury Department (1945)). The left-hand bar shows the estimate with total assets scaled by domestic GDP; the middle bar the estimate with securities (money market instruments, bonds and equities) scaled by domestic GDP; and the right-hand side bar the estimate with money (bullion, currency and deposits) scaled by domestic GDP. Standard errors are robust to heteroskedasticity and autocorrelation. 90% confidence intervals are shown as whiskers.

and asset freezes have exchange rate effects consistent with theory. The effects of sanctions are channeled through imports and assets freezing, in line with theory. Our main results are robust when we control for geopolitical risk, financial openness, trade openness, trade tariffs, time-varying country fixed effects, when we exclude sanctions imposed by the League of Nations or sanction threats from the estimation, when we restrict the estimates to countries neither on gold nor within currency blocs and using alternative data on foreign exchange quotes.

These findings suggest that recent models of the effects of sanctions on the exchange rate do not just match developments in today’s Russia episode but have broader applicability. They suggest that the direction of exchange rate movements are not an adequate metric of the success or failure of sanctions but a reflection of the type and scale of measures taken.

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# Appendix

## A Figures

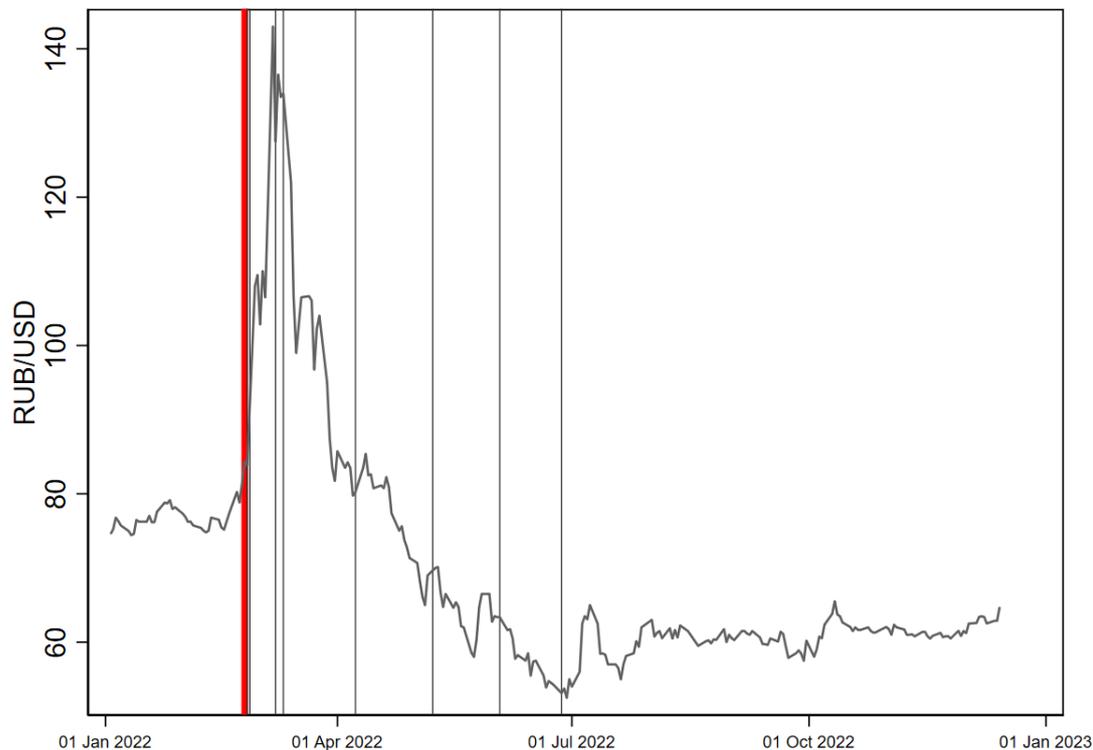


Figure A.1: Evolution of the RUB/USD exchange rate since Russia's invasion of Ukraine.

**Notes:** The figure shows the evolution of the RUB/USD exchange rate since Russia's invasion of Ukraine on 24 February 2022 (shown as a thick red line) and selected packages of sanctions (shown as thin black lines) adopted in the wake of the invasion:

24 February (US): Sberbank accounts closed; assets of Russian banks frozen, sanctions on state-owned entities and oligarchs. Restrictions on US exports of technology.

25 February (EU): Second sanction package. Financial sanctions on individuals and banks, restrictions on dual-use goods and technology exports.

26 February (G7): Removal from SWIFT of selected banks, freeze of Central Bank of Russia's reserves.

8 March (US): Ban on imports of Russian oil, liquefied natural gas and coal.

11 March (G7): Increases in import tariffs to eliminate Russia's WTO membership benefits.

8 April (EU): Fifth sanction package. Ban on imports of Russian coal (from August 2022). Expansion of export ban to jet fuel, quantum computers, semiconductors, and other products. Russian vessels prohibited from accessing EU ports.

8 May (G7): Phasing out dependence on Russian energy; export bans on key services; additional sanctions against Russian banks, oligarchs.

3 June (EU): Sixth sanction package. Eventual ban on imports of Russian crude oil and petroleum products.

27 June (G7): Crackdown on "back-filling" activities (finding other sources or markets for sanctioned supplies or resources)

**Source:** [Peterson Institute for International Economics](#).



Figure A.2: Countries sanctioned: 1914-1918.

**Notes:** The figure puts countries sanctioned during World War I on the map according to 1914's national borders. The black shade corresponds to countries which were targeted by economic sanctions, while the light grey shade shows countries that were not.

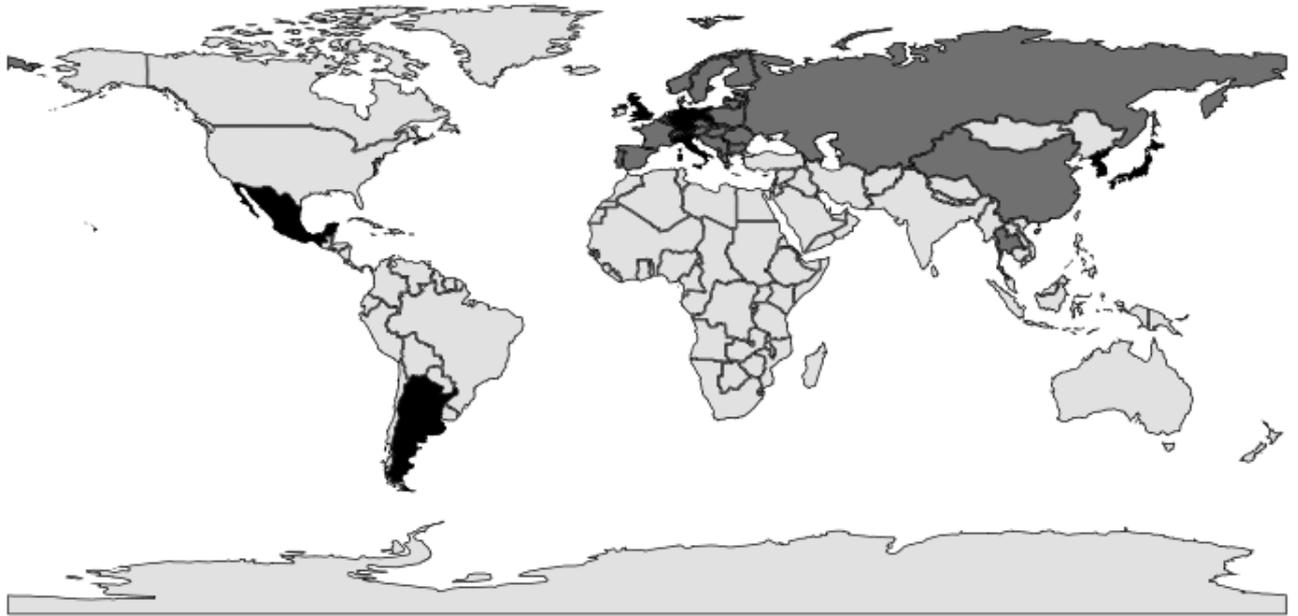


Figure A.3: Countries sanctioned: 1939-1945.

**Notes:** The figure puts countries sanctioned during World War II on the map according to 1938's national borders. 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.

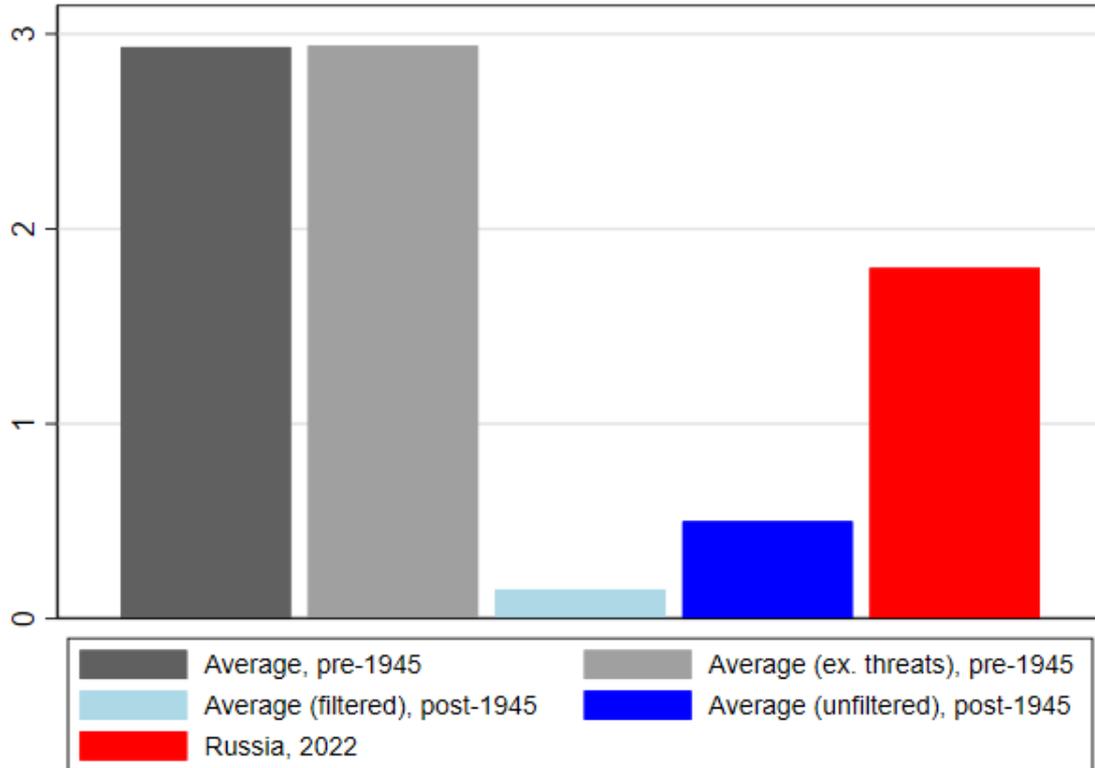


Figure A.4: Average share of global trade across sanctioned countries in selected periods. **Notes:** The figure shows the average share of global trade (in percentages) across sanctioned countries between 1914 and 1945 (grey bars), 1945 and 2018 (blue bars) and of today’s Russia (red bar), respectively. Trade shares were estimated using historical data from the RICardo Project database ([Dedinger and Girard \(2017\)](#)) for the period 1914-1938 and from the International Monetary Fund’s Direction of Trade Statistics database for the period 1945-2019. Post-1945 cases of sanctions were taken from the Global Sanctions Database ([Felbermayr et al. \(2020\)](#) and [Kirikakha et al. \(2021\)](#)). The dark blue bar corresponds to all cases. The light blue bar to cases restricted to those 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—in the spirit of today’s sanctions on Russia.

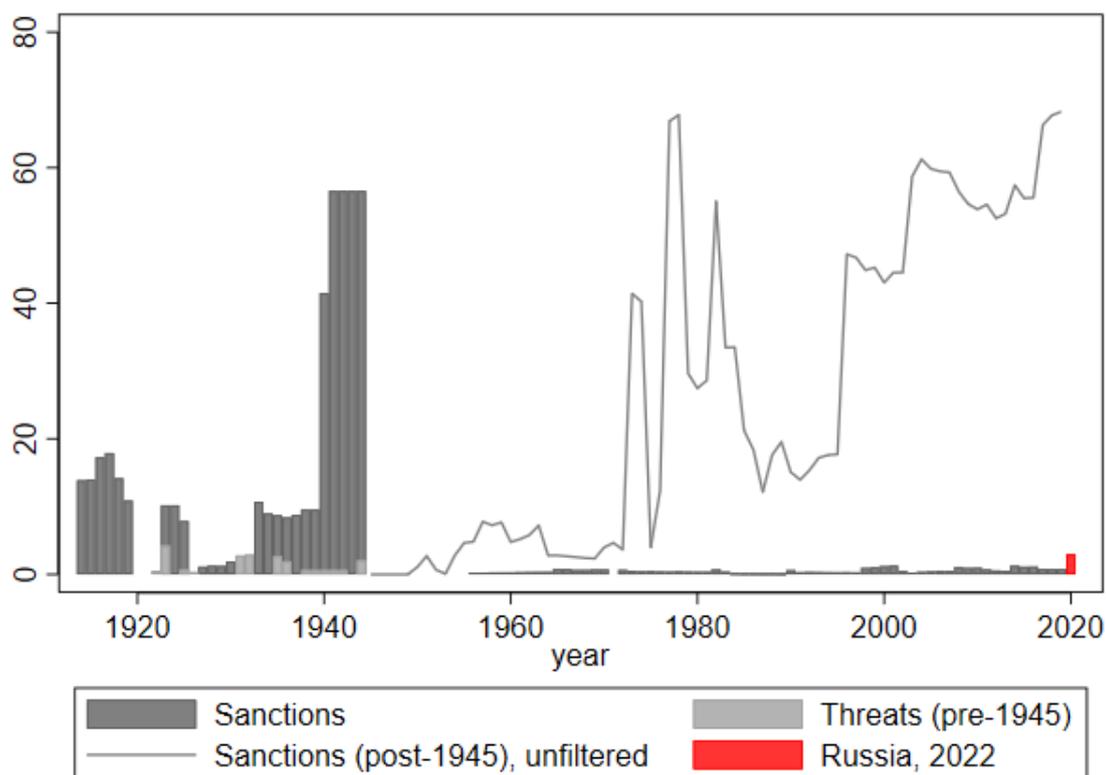


Figure A.5: Share of global trade under sanctions: 1914-2019.

**Notes:** The figure shows the evolution of the share of global trade (in percentages) of countries sanctioned between 1914 and 2019. For the 1914-1945 period, the dark grey bars correspond to the share of countries targeted by actual sanctions; the light grey bars to the share of countries threatened by sanctions. Two estimates are shown for the period 1945-2019. The light grey line corresponds to all cases of sanctions taken from the Global Sanctions Database (Felbermayr et al. (2020) and Kirikakha et al. (2021)); the dark grey bars to cases restricted to those 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—in the spirit of today’s sanctions on Russia. Trade shares estimated using historical data from the RICardo Project database (Dedinger and Girard (2017)) for the period 1914-1938 and from the International Monetary Fund’s Direction of Trade Statistics database for the period 1945-2019.

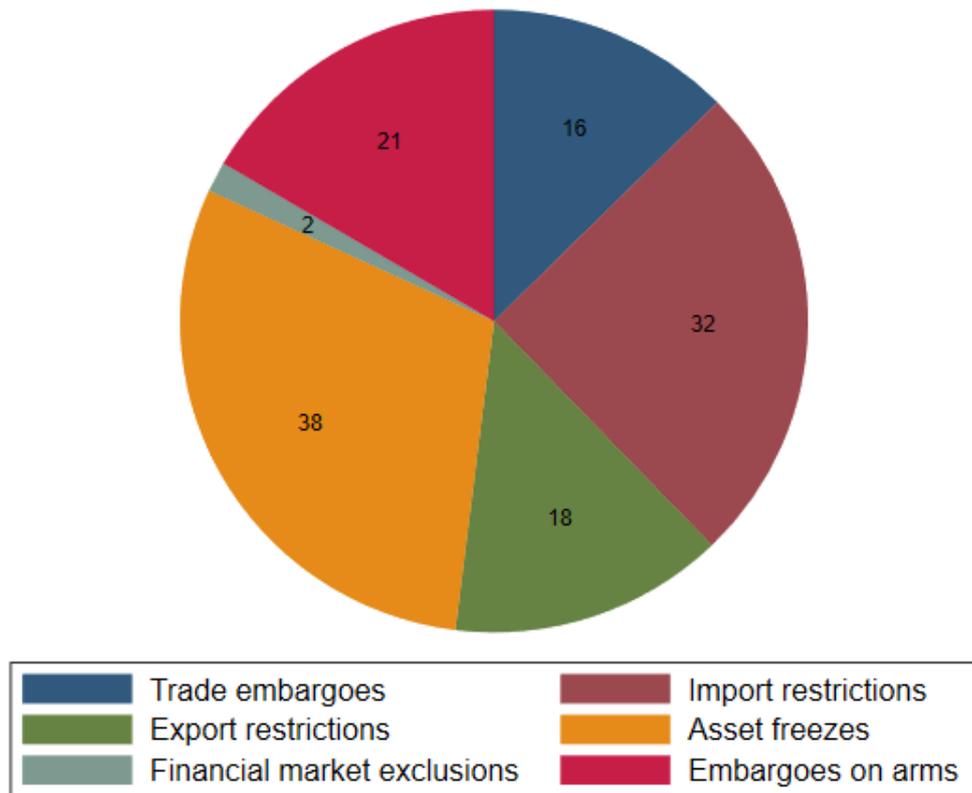


Figure A.6: Breakdown of sanctions by type: 1914-1945.

**Notes:** The figure breaks down sanctions by type distinguishing trade embargoes, import restrictions, export restrictions, asset freezes, exclusion of financial markets and embargoes on arms. The count of each type of sanctions is shown on its slice of the pie. There are in total 128 sanction-observations.

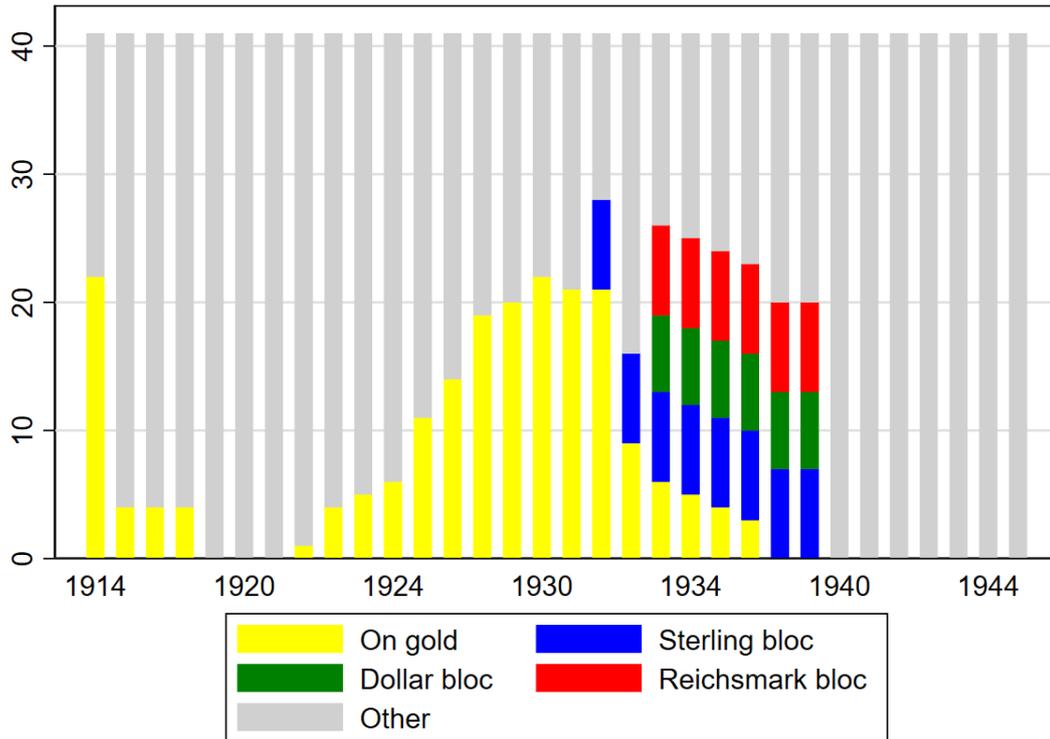


Figure A.7: Countries on gold and within currency blocs.

**Notes:** The figure counts the number of countries of our sample on the gold standard and within currency blocs, i.e. with currencies pegged to the pound sterling or the US dollar after the UK and the US abandoned the gold standard in 1931 and 1933, respectively, using data from [Reinhart and Rogoff \(2011\)](#) and [Eichengreen and Irwin \(1995\)](#).

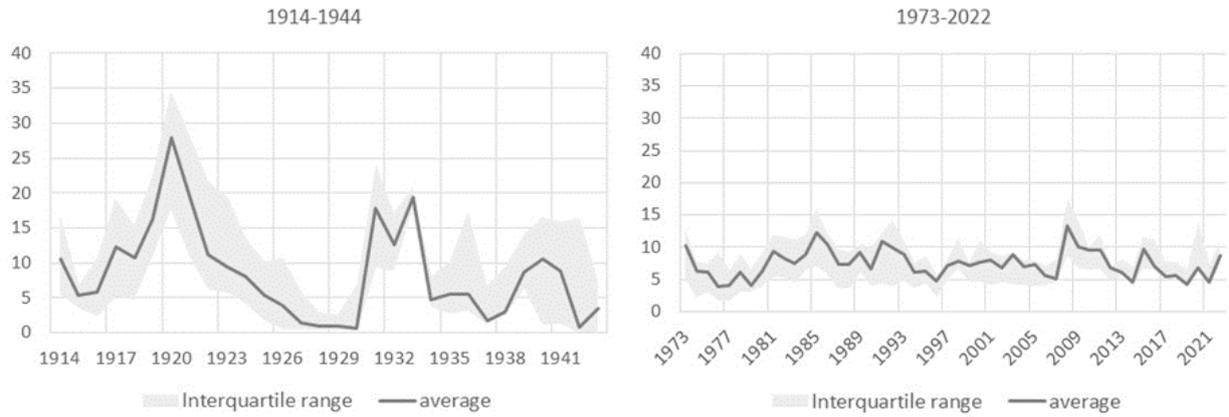


Figure A.8: Annualized average realised volatility of weekly exchange rate returns.

**Notes:** The figure in the left panel shows the unweighted average of the realised volatility of weekly exchange rate returns in annualised terms between 1914 and 1944. The figure in the right panel the unweighted average of the realised volatility of weekly exchange rate returns in annualised terms between 1973 and 2022 for the following countries: Canada, Denmark, Norway, Sweden, Switzerland, the United Kingdom, Austria, Belgium, Finland, France, Germany, Greece, Ireland, Italy, the Netherlands, Portugal, Spain, Australia, Czech Republic, New Zealand, Japan, Argentina, Chile, Colombia, Mexico, Peru, Singapore, Indonesia, China, Hong Kong, India, China, Korea, Malaysia, Philippines, Singapore, Thailand, Taiwan, Vietnam, South Africa, Israel, Egypt, Turkey, Hungary, Poland and Russia. Observations for the period 1973-2022 were obtained from Global Financial Data and the Wall Street Journal data via Haver.

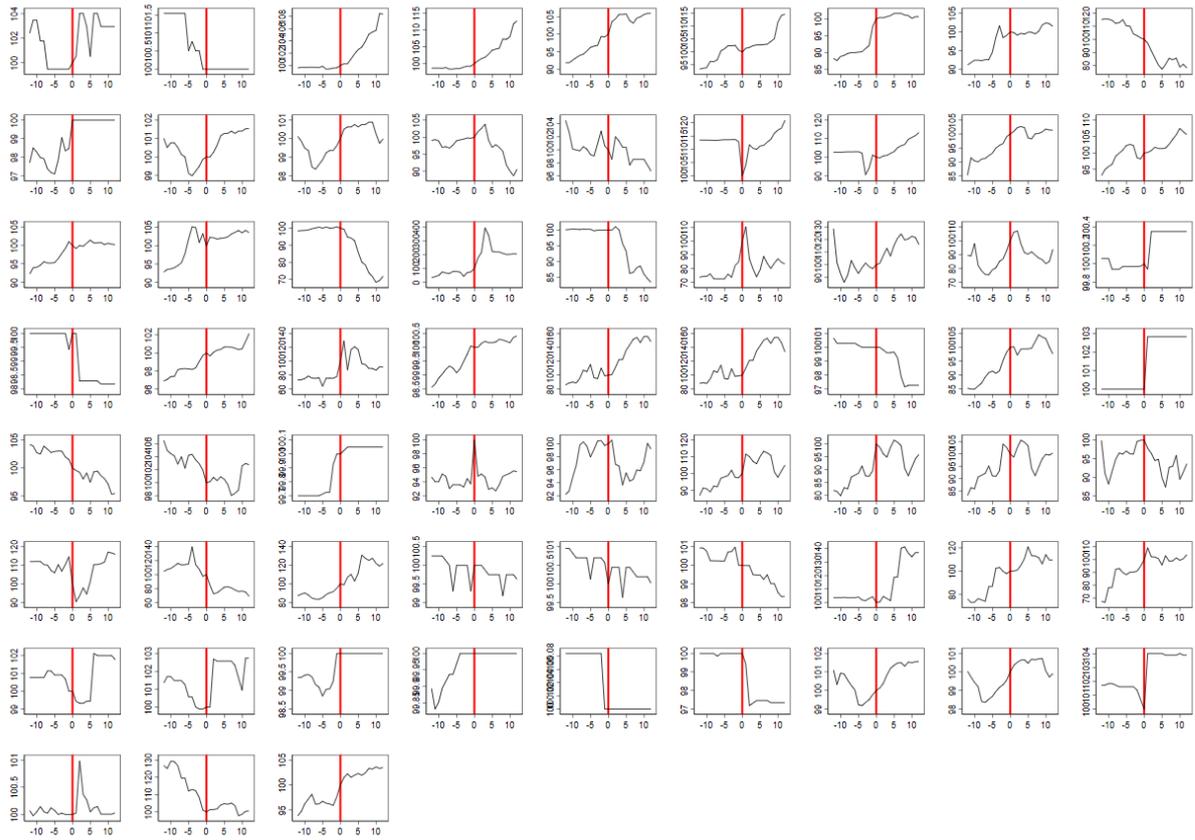


Figure A.9: Exchange rate developments around selected sanction episodes.

**Notes:** The figure shows the evolution of the exchange rate (shown as solid black lines) 12 weeks before and 12 weeks after the imposition of economic sanctions (vertical red line) in selected episodes.

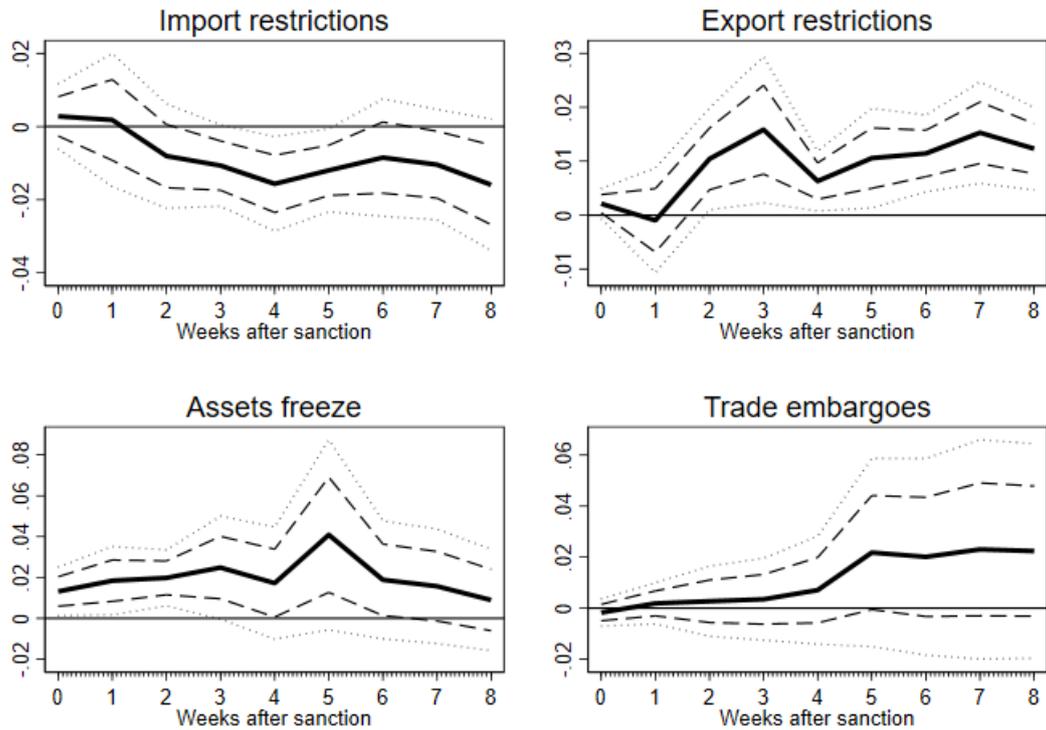


Figure A.10: Estimates controlling for geopolitical risk.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945); they control for year fixed effects, week fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings, and the index of geopolitical risk of [Caldara and Iacoviello \(2022\)](#). 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

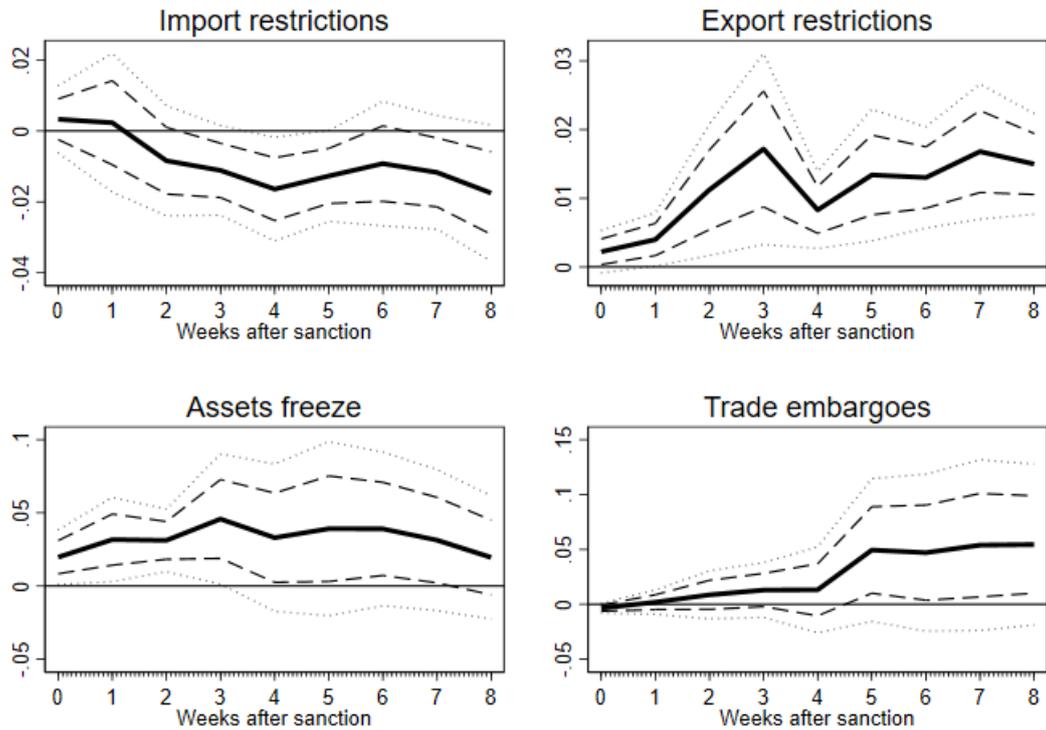


Figure A.11: Estimates controlling for financial openness.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over a restricted sample period (1914-1931) for which data on financial openness are available from [Quinn and Voth \(2008\)](#) and [Quinn and Toyoda \(2008\)](#); the estimates additionally control 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.

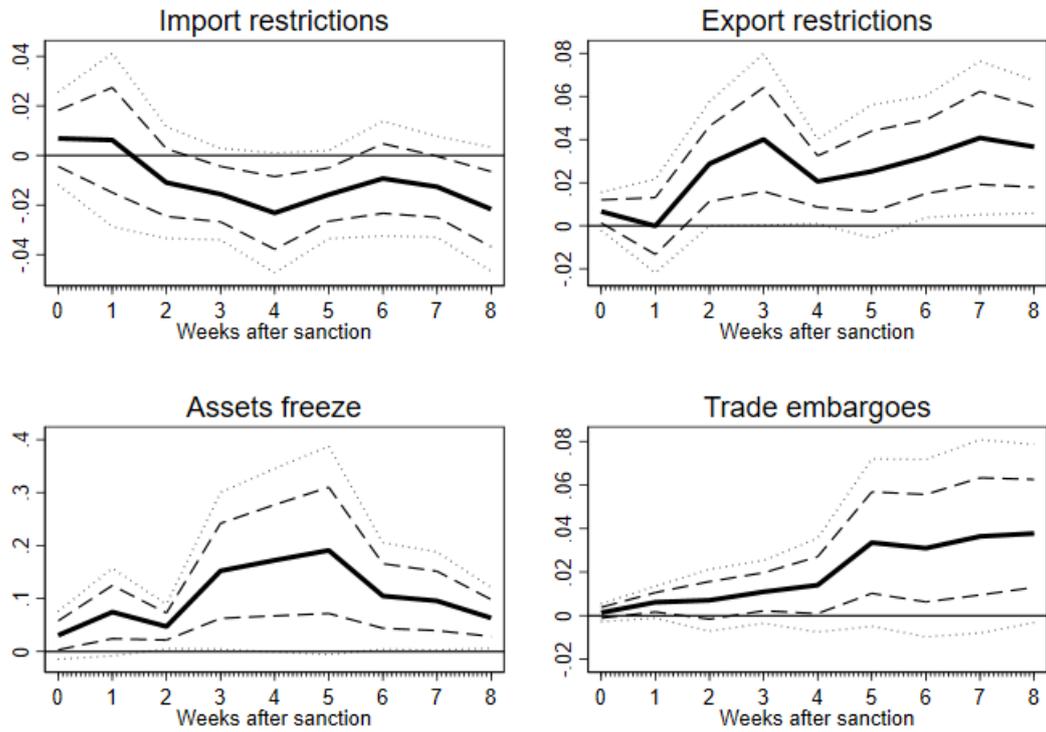


Figure A.12: Estimates controlling for trade openness.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945); they control for year fixed effects, week fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings and trade openness. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.



Figure A.13: Estimates controlling for trade tariffs.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945); they control for year fixed effects, week fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings and trade tariffs as available from [Clemens and Williamson \(2004\)](#). 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

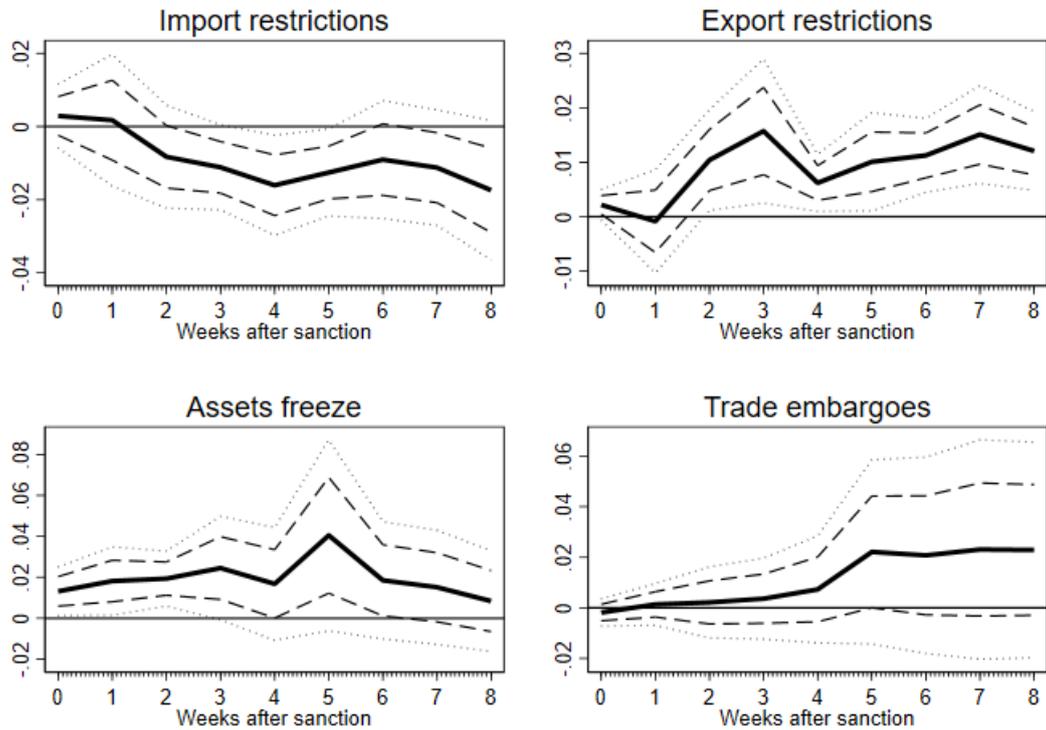


Figure A.14: Estimates controlling for month fixed-effects.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945); they control for year fixed effects, month 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.

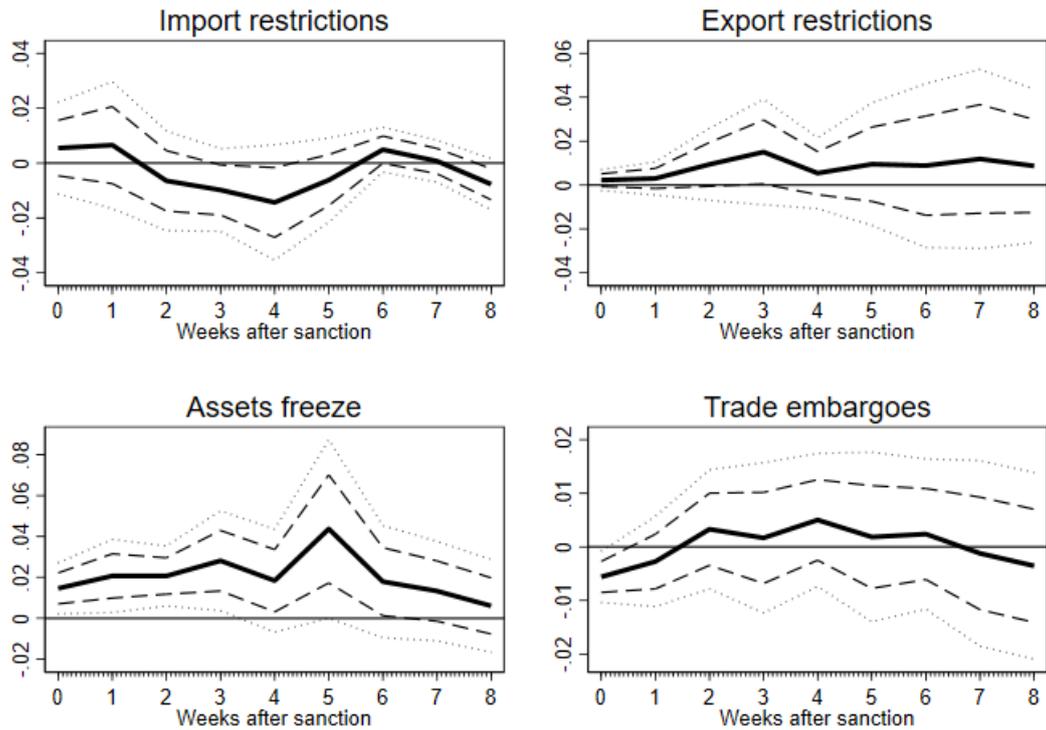


Figure A.15: Preliminary estimates controlling for country  $\times$  year fixed effects.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS controlling over the full sample (1914-1945); the estimates control for country-year fixed effects ( $\alpha_i \times \alpha_t$ ) and dummies for coincidental war outbreaks and endings. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

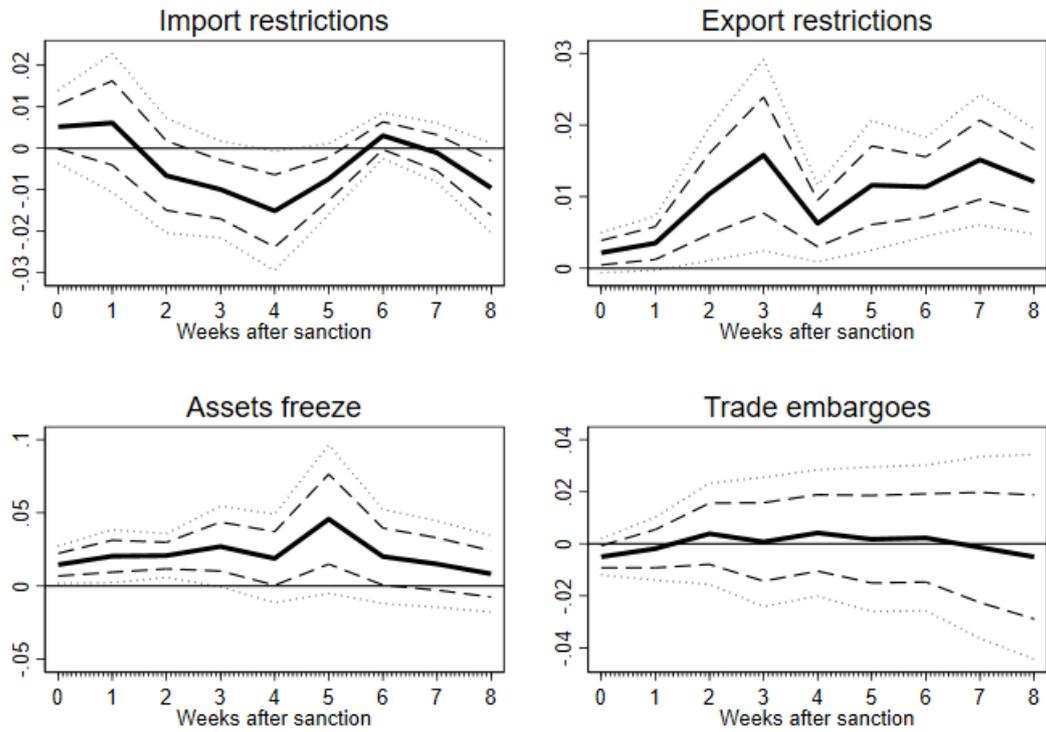


Figure A.16: Estimates excluding sanction threats.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945) excluding sanction threats; they control 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.

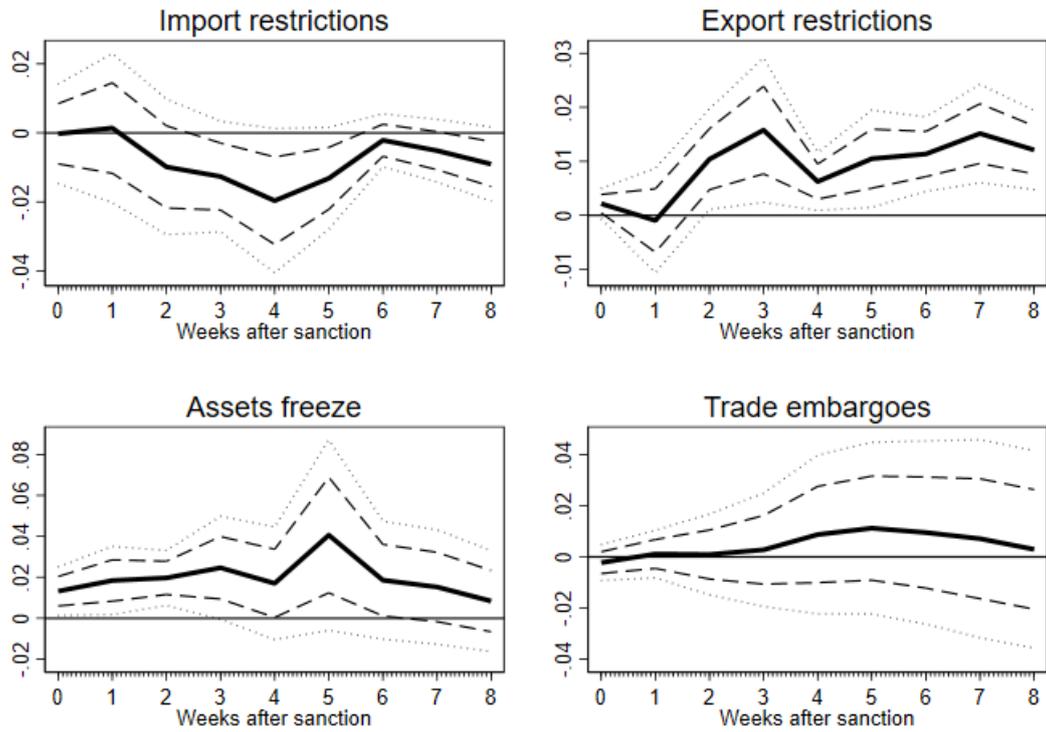


Figure A.17: Estimates excluding sanctions imposed by the League of Nations.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945) excluding sanctions imposed by the League of Nations; they control 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.

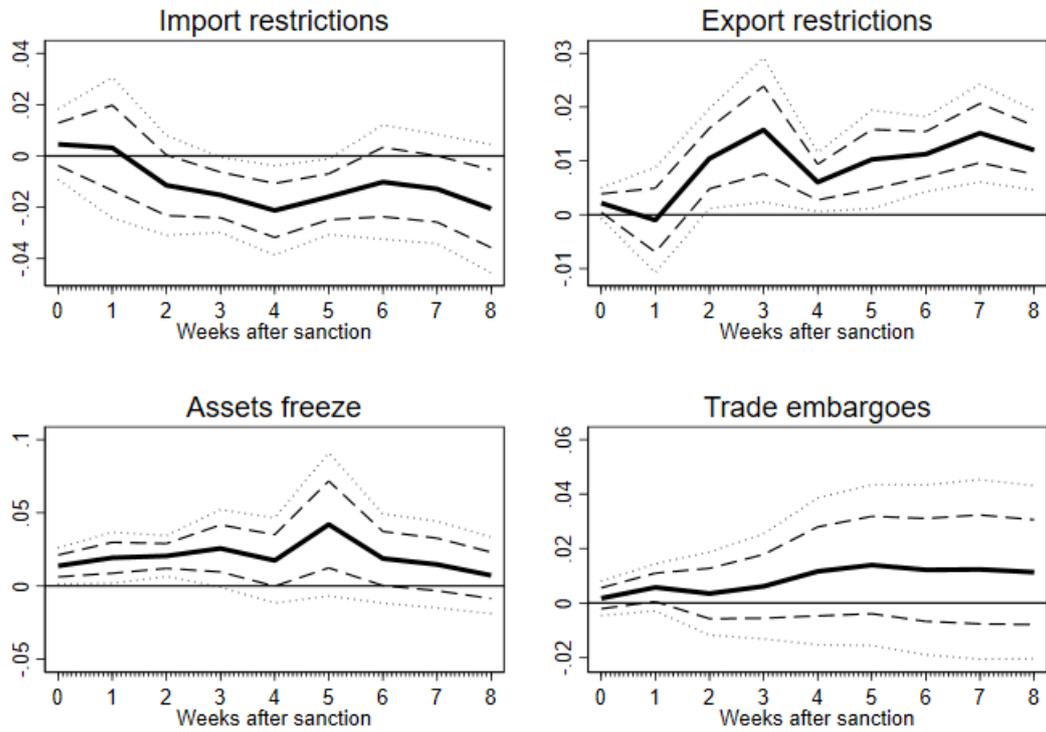


Figure A.18: Estimates on currencies neither on gold nor within currency blocs.  
**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS on a restricted sample of currencies neither on gold nor within currency blocs in the interwar period. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

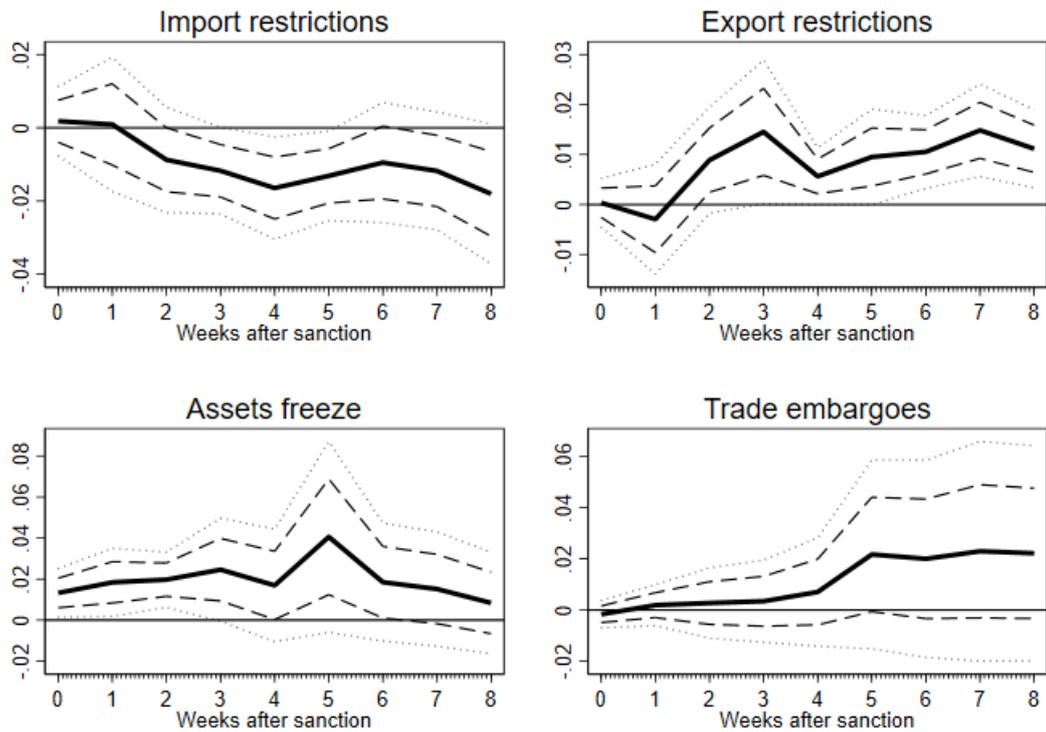


Figure A.19: Estimates with alternative foreign exchange data.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel) using an alternative data set where black market exchange rate quotes on the Swiss market, whenever available, are used for World War I. Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS over the full sample (1914-1945); they control 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.

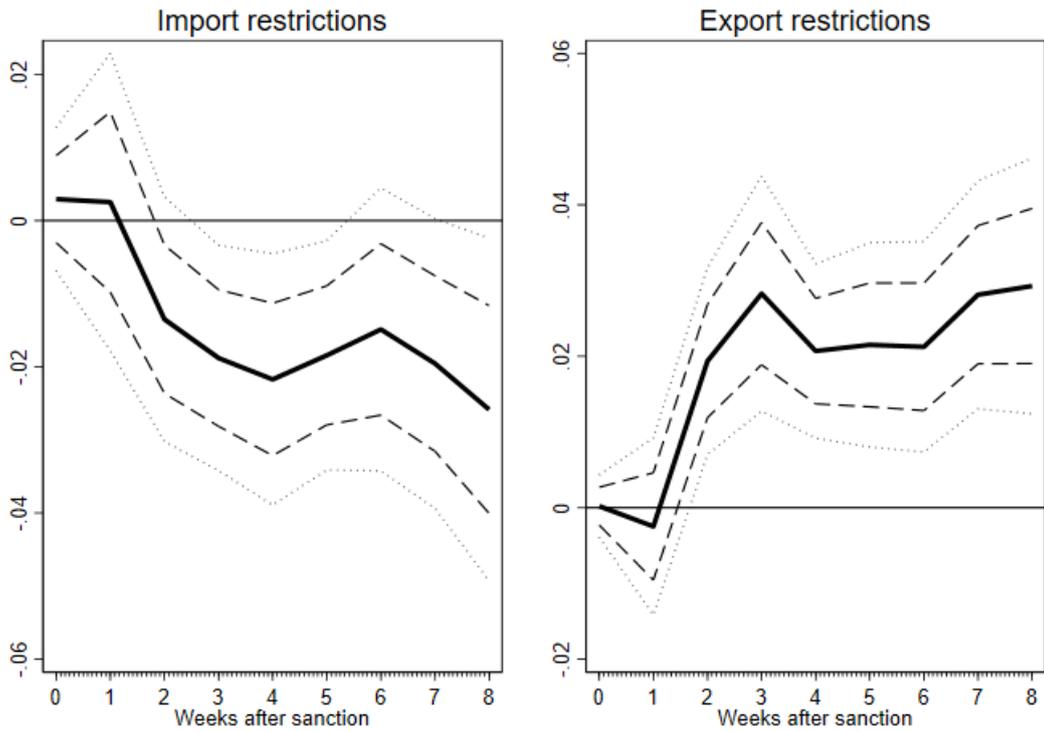


Figure A.20: Estimates with import and export restrictions included jointly.

**Notes:** The figure shows the responses of the exchange rate (shown as a solid black line) in weeks 0 to 8 following the introduction of import restrictions (left panel) and export restrictions (right panel) included jointly in the regression. Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. The local projection estimates are obtained by OLS including import and export restrictions simultaneously. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.



Figure A.21: Estimated exchange rate changes in weeks around sanction events.

**Notes:** The figure shows the estimated exchange rate changes in weeks around sanction events in the spirit of Freyaldenhoven et al. (2019) for import restrictions (upper left panel), export restrictions (upper right panel), trade embargoes (lower right panel) and asset freezes (lower left panel). Positive values indicate that the exchange rate depreciates vis-à-vis the US dollar. 1 (1.65) standard-deviation confidence bands are shown as dashed (dotted) lines.

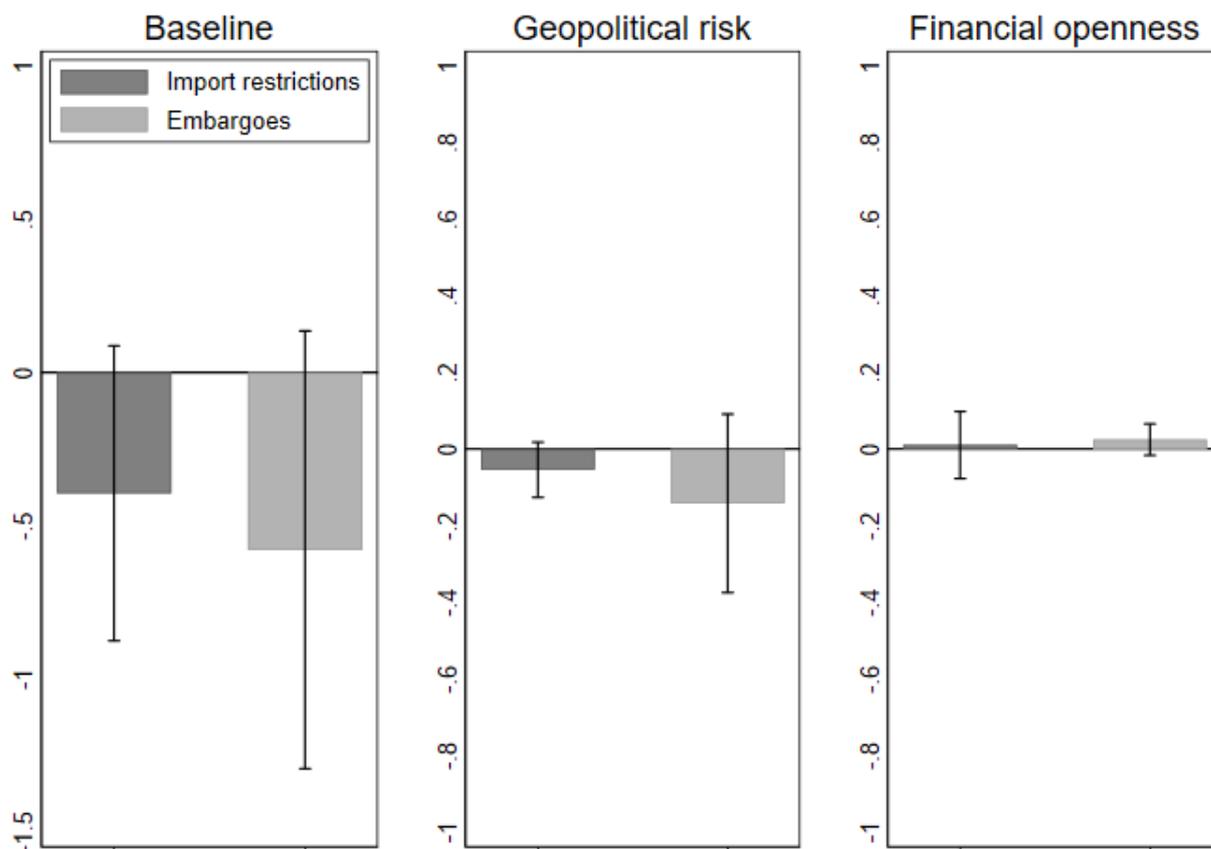


Figure A.22: Transmission channels—Imports.

**Notes:** The figure shows the estimated contemporaneous effect of import restrictions (dark grey bars) and embargoes (light grey bars) on changes to total real imports in US dollars of country  $i$  in year  $t$ . The baseline estimates of the left-hand side panel are obtained by OLS on the sample period 1914-1938 and control for year fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings. The estimates of the middle panel are obtained on the same sample period and control for currency fixed effects, dummies for coincidental war outbreaks and endings and the index of geopolitical risk of [Caldara and Iacoviello \(2022\)](#). The estimates of the right-hand side panel are obtained on the sample period 1914-1931 and control for year fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings and the financial openness measure of [Quinn and Voth \(2008\)](#) and [Quinn and Toyoda \(2008\)](#). 90% confidence intervals are shown as whiskers.

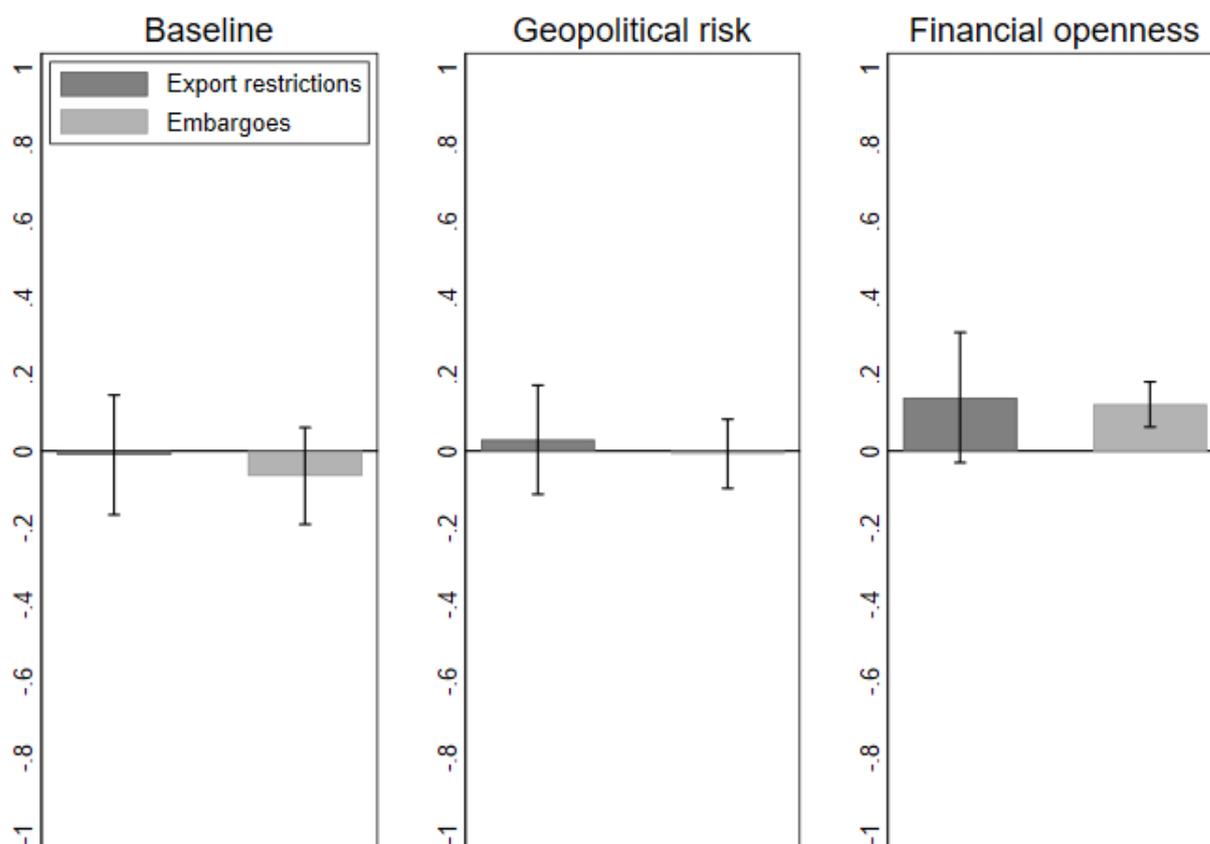


Figure A.23: Transmission channels—Exports.

**Notes:** The figure shows the estimated contemporaneous effect of export restrictions (dark grey bars) and embargoes (light grey bars) on changes to total real exports of country  $i$  in year  $t$ . The baseline estimates of the left-hand side panel are obtained by OLS on the sample period 1914-1938 and control for year fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings. The estimates of the middle panel are obtained on the same sample period and control for currency fixed effects, dummies for coincidental war outbreaks and endings and the index of geopolitical risk of [Caldara and Iacoviello \(2022\)](#). The estimates of the right-hand side panel are obtained on the sample period 1914-1931 and control for year fixed effects, currency fixed effects, dummies for coincidental war outbreaks and endings and the financial openness measure of [Quinn and Voth \(2008\)](#) and [Quinn and Toyoda \(2008\)](#). 90% confidence intervals are shown as whiskers.

## B Tables

Table B.1: Overview of selected existing databases on sanctions

	No. of episodes	Sample period	Data type	Frequency	Granularity of information on sanctions
Hufbauer et al. (2010)	204 (10 pre-1939)	1914-2006	Case studies	Irregular	-Uncoded lists of measures taken
Kirikakha et al. (2021), Felbermayr et al. (2020)	1,101	1950-2019	Coded classification	Annual	-Type (trade, financial, travel) -Policy objective -Perceived degree of success
Clifton et al. (2014)	1,412	1945-2005	Coded classification	Daily	-Type (economic embargo, import/export restrictions, asset freeze, termination of foreign aid, travel ban, suspension of economic agreement) -Issue at stake, Threat identity, carrots, diplomatic sanctions, economic costs, etc.
Von Soest and Wahnman (2015)	122	1990-2010	Coded classification	Annual	-Type (financial sanctions, trade embargo, non-economic sanctions) -Intensity

*Notes:* The table provides summary information on selected existing databases on sanctions, including the number of sanction episodes available, sample period, data type, frequency of observations, and granularity of information available.

Table B.2: Overview of the basic estimates

	$\beta \times 100$	$p$ -value	$R^2$	Obs.	Clusters
Import restrictions					
1 week	0.19	(0.87)	0.02	38,051	27
4 weeks	-1.61	(0.06)	0.04	38,078	27
Export restrictions					
1 week	-0.10	(0.87)	0.02	38,051	27
4 weeks	0.63	(0.05)	0.04	38,078	27
Asset freezes					
1 week	1.84	(0.07)	0.02	38,051	27
4 weeks	1.71	(0.31)	0.04	38,078	27
Trade embargoes					
1 week	0.19	(0.70)	0.02	38,051	27
4 weeks	0.70	(0.58)	0.04	38,078	27

*Notes:* The table reports the estimates from [Equation \(1\)](#) of the effect of sanctions on the exchange rate broken down by sanction type at the 1-week and 4-week horizons, together with selected post-estimation statistics.

Table B.3: Estimates controlling for the fiscal balance-to-GDP ratio

	$\beta \times 100$	$p$ -value	$R^2$	Obs.	Clusters
Import restrictions					
1 week	-1.22	(0.24)	0.04	22,277	21
4 weeks	-1.48	(0.31)	0.07	22,263	21
Export restrictions					
1 week	-0.96	(0.50)	0.04	22,277	21
4 weeks	0.24	(0.37)	0.07	22,263	21
Asset freezes					
1 week	0.51	(0.05)	0.04	22,277	21
4 weeks	0.59	(0.27)	0.07	22,263	21
Trade embargoes					
1 week	0.28	(0.72)	0.04	22,277	21
4 weeks	1.66	(0.47)	0.07	22,263	21

*Notes:* The table reports estimates from [Equation \(1\)](#) of the effect of sanctions on the exchange rate at the 1-week and 4-week horizons controlling for the fiscal balance-to-GDP ratio.

Table B.4: Estimates of transmission channels - Imports and exports

	Import restrictions			Trade embargoes		
	Baseline	Geopolitical risk	Financial openness	Baseline	Geopolitical risk	Financial openness
$\beta$	-0.39	-0.05	0.01	-0.58	-0.14	0.02
	(0.19)	(0.23)	(0.85)	(0.20)	(0.33)	(0.34)
$R^2$	0.23	0.08	0.33	0.24	0.08	0.33
Observations	733	597	313	733	597	313
Clusters	34	26	14	34	26	14
	Export restrictions			Trade embargoes		
	Baseline	Geopolitical risk	Financial openness	Baseline	Geopolitical risk	Financial openness
$\beta$	-0.01	0.03	0.14	-0.07	-0.01	0.12
	(0.92)	(0.74)	(0.19)	(0.41)	(0.89)	(0.00)
$R^2$	0.25	0.02	0.41	0.25	0.02	0.40
Observations	731	597	313	731	597	313
Clusters	34	26	14	34	26	14

*Notes:* The upper (lower) panel of the table reports estimates from [Equation \(2\)](#) of the effect of import (export) restrictions or trade embargoes on changes to total real imports (exports) of country  $i$  in year  $t$ ;  $p$ -values obtained from clustered standard errors by country are reported in parentheses. See [Figure A.22](#) and [Figure A.23](#) for further details on the estimation method.

Table B.5: Estimates of transmission channels - Assets freeze

	Total assets/GDP	Securities/GDP	Money/GDP
$\beta$	2.51 (0.00)	7.32 (0.00)	1.31 (0.00)
$R^2$	0.77	0.78	0.75
$N$	12	12	12

*Notes:* The table reports cross-sectional estimates of [Equation \(3\)](#) 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, as described in [Figure 5](#);  $p$ -values are reported in parentheses. Standard errors are robust to heteroskedasticity and autocorrelation.

## C Episodes of Economic Sanctions

### C.1 The Blockade of the Central Powers (1914-1919)

**Description:** The German blockade (or the Blockade of Europe) was a naval blockade by the Allies during and after World War I imposed in an effort to restrict the maritime supply of goods to the Central Powers (Germany, Austria-Hungary, and later also the Ottoman Empire and Bulgaria). The blockade went through three phases: from August 20th, 1914, a restricted blockade; from March 11th, 1915, an unrestricted blockade to prevent all goods entering or leaving Germany; and finally from April 6th, 1917, an unrestricted blockade with American collaboration.

**Economic sanctions:** On August 4th, 1914, Britain and France established a naval blockade of Germany and Austria-Hungary and issued a comprehensive list of contraband. Initially the measures were drawn from the London Declaration of 1909. The list contained 12 items of *absolute contraband*, i.e. goods that could be captured whenever destined for an enemy power. Concretely those referred to weapons, munitions and explosives, military equipment and clothing, armour, warships, planes, balloons and parts thereof as well as tools and machines to make or repair those items. The only change compared to the original declaration was the addition of flying machines (a technological adaptation which had been foreseen in the legal framework). There was also a 13 item list of *conditional contraband*, i.e. goods such as food and fuel that could be captured if shown to be destined for the use of the armed forces of a government department of the enemy state, excepting when the ship transporting them did not plan to enter an enemy port.<sup>54</sup> Already on August 20th the blockade was tightened by reserving the right to capture conditional contraband destined for the enemy, regardless of the port to which it was delivered. Following protests by European neutrals and the US, on October 29th, 1914 a new rule concerning conditional contraband stated that only those goods would be captured that were declared for known enemy agents, for no specific recipient at all, or to order. However in practise other means were found to block such transports.

On December 23th, 1914, lists were further extended to include materials for explosives. On March 11th, 1915 (after the German counter-blockade which had declared on February 4th, 1915 the seas around the British Isles to be war zones, and that any com-

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<sup>54</sup>Conditional contraband therefore could not be captured when destined for a neutral port, even if it would be then sold and shipped to the enemy over land (continuous voyage).

mercial vessel found in those waters would be destroyed), Britain and France expanded their embargo. They imposed a ban on all goods of German origin, ownership or destination. On May 27th, 1915, lathes and other machines or machine tools capable of being employed in the manufacture of munitions of war were added to the list of absolute contraband. Cotton, used for the production of uniforms and munitions was also added, but only after a deal was reached with the US, whose Southern states depended on its exports, in August 1915.

An official blockade was imposed on the Ottoman Empire from August 25th, 1915. In practice the blockade had been in effect from August 20th, 1914.) There was then a tightening on August 25th, 1915, when the blockade was extended along the Syrian coast (whereas before only the entrance to the Aegean Sea was subject). After December 3rd, 1915, the blockade of the Ottoman Empire was further tightened, such that American ships were no longer allowed to pass.

On October 16th, 1915, a blockade was proclaimed of the Aegean coast of Bulgaria. On July 11th, 1917, the United States entered into the war, and after Anglo-American negotiations the US government decided to emulate British measures of economic warfare.

The blockade was finally relaxed in the course of 1919. The blockade was partially lifted on January 17th, 1919, when the Allies allowed the importation of food under their supervision. However, food deliveries were delayed until March 8th, 1919, when the German government agreed to the restrictions imposed by the Allies. On March 10th, 1919, the blockade was lifted for Austria and on March 20th, 1919 for Bulgaria. In the case of Germany, the blockade was lifted on July 12th, 1919, following the Treaty of Versailles.

**Source:** [Daughty and Raugh \(1991\)](#), [Cummings \(2015\)](#), [Goetter \(2021\)](#), *Der Bund*, March 10th, 1919 edition, "Bulgarian Blockade Declared by Allies; All Aegan Ports Mined Against Attack", *New York Times*, 17 October 1915, [https://encyclopedia.1914-1918-online.net/article/naval\\_blockade\\_of\\_germany](https://encyclopedia.1914-1918-online.net/article/naval_blockade_of_germany).

## C.2 US Steel Embargo of Japan (1917-1918)

**Description:** The US Steel Embargo of 1917-1918 was part of US efforts to maintain control in Asia, and specifically to maintain China's integrity and the Open Door policy (the policy between China, the US, Japan, and European powers that stated each of

those countries should have equal access to Chinese trade). The embargo proved partially ineffective and was abandoned after the war.

**Economic sanctions:** On July 9th, 1917, US President Woodrow Wilson issued an executive order embargoing exports of steel and iron and other items used in maritime construction by Japan. The intention was to hit Japan's shipping industry and its position in the business of carrying trade in the Pacific due to war-created carrying shortages. On October 12th, 1917, a war trade board was established as the sole issuer of exporter licenses to sell steel and iron to Japan. Ironically, the export embargo forced Japan to reconsider its lack of resources and develop its own supplies of iron and steel—with success. On March 18th, 1918, the embargo started to be relaxed and large purchases of Japanese cargo carriers for American steel were authorized. Japan's shipping industry and the Tokyo stock market responded positively. Being judged as ineffective in slowing down Japan's maritime strength, the embargo was abandoned de facto on November 22nd, 1918.

**Source:** [Safford \(1970\)](#).

### C.3 Naval blockade of Greece (1916-1917)

**Description:** The naval blockade of Greece was established by the Entente Powers during World War I. Initially, Greece had remained neutral. However, following the surrender of a key fortress to Bulgaria, Britain and France were convinced that the Greek government was hostile to their cause. The Entente Powers responded with a naval blockade, which was further tightened after relations between Entente Powers and the royal government in Athens broke down. The blockade came to an end after King Constantine abdicated in June 1917. This led to unification of Greece under a new King and the leadership of Venizelos. From this point Greece joined World War I on the side of the Allies.

**Economic sanctions:** On June 7th, 1916, Britain and France declared a partial naval blockade of Greece. Greek ships were liable to be stopped and searched, while those in Allied harbours were detained. The French took control of Thessaloniki harbour. Following an armed confrontation in Athens between the royalist government and Allied forces over the issue of Greece's neutrality, the British announced a full blockade on November 19th, 1916. This was designed to force Greece into the War, or else bring about regime change in the country. But the blockade failed in this ultimate objective.

It came to an end on June 11th, 1917.

**Source:** Shirkey (2010), <https://drpatwalsh.com/2021/02/23/greek-independence-fact-or-fiction/>, Roudometof (2001)

## C.4 The Blockade of Russia (1918-1920)

**Description:** The Allied Blockade of Russia was put in place to overthrow of the Provisional Government in Russia by Lenin and his followers. The measures did not enjoy legal status because the US refused to declare a formal blockade without a declaration of war. Moreover, the US refused a pacific blockade enforced by Allied governments or the League of Nations. In practice, however, Allied governments maintained an effective blockade resulting in the economic isolation of Bolshevik Russia.

**Economic sanctions:** The blockade was put in place on the day of the Armistice with Germany, November 11th, 1918. It prevented Allied nationals from engaging in commerce with Bolshevik Russia. In addition, Allied nationals had to implement the following policy: (i) refusal of sailing permits to all ships leaving from Russian ports in the hands of Bolsheviks or coming from said ports; (ii) establishment of a similar measures for all commodities destined to be sent to Bolshevik Russia by other routes; (iii) refusal of passports to all persons going to or coming from Bolshevik Russia; (iv) arrangements with a view to preventing banks from doing business with Bolshevik Russia and (v) as far as possible, refusal by each Government to its own nationals of facilities of communication with Bolshevik Russia by mail, telegraph or wireless. The blockade also implicitly covered Russian gold: Allied governments considered that they had a right to Russian gold so that they could compensate Russia's expropriated capitalists and repay its debts. This became a huge obstacle to Soviet trade, since major banks or and governments no longer could accept Soviet gold. The Baltic States were the first to breach the blockade, and their peace agreements opened the way to trade contracts between the various parties. Allied troops finally lifted the full blockade on January 16th, 1920. Initially, trade was to be limited to that with the "Russian people" through Centrosoyuz, the All-Russian Union of Consumer Co-operative Societies. On March 16th, 1921, the United Kingdom and the Russian Socialist Federal Soviet Republic signed the Anglo-Russian trade agreement. This ended the British blockade, opening Russian ports to British ships.

**Source:** <https://wdc.contentdm.oclc.org/digital/collection/russian/id/829>, Gaworek

(1975), <https://www.cadtm.org/Russia-Origin-and-consequences-of-the-debt-repudiation-of-February-10-1918>.

## C.5 US Freezes of Assets under the Trading with the Enemy Act (1917-1945)

**Description:** The Trading with the Enemy Act (TWEA) of October 6th, 1917, gives the US President the power to oversee or restrict trade between the United States and its enemies in times of war. It was amended in 1933 by the Emergency Banking Act to extend the president's authority to peacetime. The TWEA has served as the statutory foundation for US sanctions as a foreign policy tool. It was used extensively in World War II and since 1945.

**Economic sanctions:** The United States declared war on Germany on April 6th, 1917. TWEA was enacted on October 6th, 1917 and on October 22nd, 1917, President Wilson created an office with the power to confiscate assets from anyone whose actions might be considered a threat to the war effort. The aim was to seize German assets in the US and conscript German resources for the benefit of the US war effort. On December 7, 1917, the United States declared war on the Austria-Hungary Empire and seized its funds. The end of the war did not relieve foreign property owners. In 1921, under the Congressional resolution that ended the war with Germany, the US retained all seized assets; this was in the spirit of the provisions of the Treaty of Versailles, which allowed Allied nations to use enemy assets to repay their claims. Following Germany's invasion of Denmark and Norway on April 9th, 1940, President Roosevelt invoked TWEA and froze their assets held in the US to prevent the Nazis from making use of them. As other countries were invaded or dominated by the Axis, freezing was successively extended during 1940 and the first half of 1941 to their assets; this was by executive orders taken approximately on the dates of invasion or domination.<sup>55</sup> On June 14th, 1941, the asset freeze was extended to the aggressors Germany and Italy and, with the exception of Turkey, to the rest of Continental Europe and neutral countries. On July 26th, 1941, the

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<sup>55</sup>More precisely on: April 8, 1940: Norway and Denmark; May 10, 1940: The Netherlands, Belgium, and Luxembourg; June 17, 1940: France (including Monaco); July 10, 1940: Latvia, Estonia, and Lithuania; October 9, 1940: Romania; March 4, 1941: Bulgaria; March 13, 1941: Hungary; March 24, 1941: Yugoslavia; April 28, 1941: Greece; and June 14, 1941: Albania, Andorra, Austria, Czechoslovakia, Danzig, Finland, Germany, Italy, Liechtenstein, Poland, Portugal, San Marino, Spain, Sweden, Switzerland, and Union of Soviet Socialist Republics.

asset freeze was extended to Japan after its invasion of Indochina, and to China on the same day, at the request of General Chiang Kai-Shek. The 1941 freeze was extended to Thailand on December 9th, and to Hong Kong on December 26th, 1941.

**Sources:** [Lourie \(1943\)](#), [Coates \(2018\)](#), Executive Order 8785 Freezing the Assets of Certain European Countries, June 14, 1941, <https://www.presidency.ucsb.edu/documents/executive-order-8785-freezing-the-assets-certain-european-countries>.

## C.6 The Greco-Turkish War (1920-1922)

**Description:** The Greco-Turkish War was a conflict between Greece and Turkey during the partitioning of the Ottoman Empire following World War I, extending from May 1919 to October 1922. The Allies had promised Greece territory in Anatolia at the expense of the Ottoman Empire. Greek forces landed in Smyrna (now İzmir), on May 15th, 1919, and took control of the western and northwestern part of Anatolia. Turkish forces counterattacked and, in August 1922, the war ended with the recapture of Smyrna by Turkish forces. The Greek government accepted Turkish demands and returned to its prewar borders. The Allies abandoned the Treaty of Sèvres to negotiate a new Treaty at Lausanne, which was signed on July 24th, 1923. The Treaty of Lausanne recognized the independence of the Republic of Turkey and its sovereignty over Anatolia, Istanbul, and Eastern Thrace. The Greek and Turkish governments agreed to engage in a population exchange.

**Economic sanctions:** The League of Nations failed to stop the Greco-Turkish war despite that economic sanctions would have been possible against either combatant. British and French officials considered whether they should impose economic sanctions on Turkey. They leaked to the press on February 8th, 1922, that they were considering a blockade of the coasts of Asia Minor. British officials kept the option of sanctions open during negotiation of the Treaty of Lausanne, notably when discussions briefly collapsed in early 1923.

**Source:** [De Fiedorowicz \(1936\)](#), [Larew \(1973\)](#), [Mulder \(2022\)](#), “Puzzle d’Asie,” *L’Intransigeant*, February 9th, 1922, p. 3, <https://gallica.bnf.fr/ark:/12148/bpt6k789899t/f3.item.r=%22puzzle%20d’asie%22.zoom>.

## C.7 The Albanian Mirdita crisis (1921)

**Description:** The Republic of Mirdita was a short-lived (unrecognized) republic declared in northern Albania. It existed between July 17th and November 20th, 1921. It was recognized by Greece and received Yugoslav financial and weapon support. These events coincided with international negotiations over the finalisation of the Albanian-Yugoslav border. On November 2nd, 1921, Yugoslav troops invaded Albanian territory beyond the areas they were already occupying. The League of Nations dispatched a commission composed of representatives of Britain, France, Italy, and Japan that reaffirmed Albania's 1913 borders. At that point Yugoslavia had no choice but to withdraw its troops.

**Economic sanctions:** The threat of possible enforcement of Article 16 had a prohibitive influence in the Albanian-Serb-Croat-Slovene war-like struggle. On March 3rd, 1921, in a memorandum sent to the League, the Albanian government requested the Council of the League to take steps to preserve Albania's territorial integrity, which it alleged was being violated by the Serb-Croat-Slovene state. The Secretary-General of the League then invited the interested states to send their delegates to Geneva on June 25th, 1921. The matter was presented to the Council at its meeting in June 1921. At that point Albania was the only state of the opinion that it should be the League and not the Conference of Ambassadors that should address the conflict.

The Conference of Ambassadors analyzed the Albanian issue from June until early November 1921. During this time, the situation worsened in northern Albania. The British government assessed that the situation was so serious as to justify a meeting of the Council in an extraordinary session. Consequently, the British Prime Minister asked on November 7th to immediately call the Council *"to study the situation and to take the necessary measures, according to Article 16, in case that the Serbs-Croats-Slovenes government refused or delayed to execute its obligations as defined by the agreement"*. On November 9th, 1921, Great Britain, France, Japan and Italy recognized Albania's borders and government. The Council met on November 16th to publicly hear interested parties. It reaffirmed the 1913 borders in line with the Conference of Ambassadors' findings. On November 17th, Yugoslavia evacuated its military forces.

**Source:** [de Fiedorowicz \(1936\)](#), [Krisafi \(2014\)](#), [Kohn \(1924\)](#).

## C.8 The Corfu Incident (1923)

**Description:** The Corfu Incident was a 1923 conflict between Greece and Italy triggered by the killing of Italian soldiers in Greek territory. Italy issued an ultimatum to Greece, which was accepted only partially, and sent forces to bombard and occupy Corfu. Mussolini defied the League of Nations, and threatened to leave the League should the latter become involved in the conflict. The Conference of Ambassadors then tendered an agreement favouring Italy. This epitomized the League's weakness when dealing with large nations.

**Economic sanctions:** When Corfu was bombarded, the British government immediately investigated the possibility of sanctions under Article 16. The desire of the British government and public to proceed with at least some sanctions was strong. But Foreign Secretary Curzon's attempt to settle the crisis through intervention of the League of Nations was abandoned once Mussolini threatened to leave the League. Sanctions against Italy would require the approval of the League Council, and support from France was uncertain. Her Majesty's Treasury and Admiralty pointed to practical challenges of applying sanctions against Italy. The former highlighted the difficulty of implementing the complex system of control of trade and commerce, which would be resisted by the business community and be ineffective unless the US cooperated. The Admiralty claimed that an effective blockade would require a declaration of war and the concentration of the Royal Navy in the Mediterranean. The prevalent opinion in the Council was that the case was a fit one for appeal under Article 16, but fear of the repercussions from applying sanctions against a Great Power prevailed. The Great Powers preferred to utilise the fact that the Italians killed were acting on behalf of the Conference of Ambassadors and therefore to settle the dispute through this body. Following Greece's agreement, the terms of settlement were accepted by Italy on September 10th, 1923.

**Source:** [De Fiedorowicz \(1936\)](#), [Yearwood \(1986\)](#), [Mulder \(2022\)](#).

## C.9 The Occupation of the Ruhr (1923-1925)

**Description:** The military occupation of Germany's Ruhr region by France and Belgium lasted from January 11th, 1923 to August, 25th, 1925. The occupation of this heavily industrialized region was a response to Germany's defaults on reparations payments fore-

seen by the Treaty of Versailles. It worsened Germany's economic crisis and led to acts of resistance from the German population. France and Belgium were pressured to accept the Dawes Plan of August 16th, 1924 to restructure Germany's payment of war reparations and withdrew from the Ruhr a year later.

**Economic sanctions:** Whether the occupation was an act of war or a sanction authorized by international law was heavily debated by contemporaries. It was observed that the League of Nations was not called upon to stop the occupation and that "the legal authorities and the Government [of Germany] did not conceal their view that the Franco-Belgian action in occupying the Ruhr was not a sanction authorised by the Treaty [of Versailles]" (De Fiedorowicz (1936), p. 119). Others claimed that Article 248 of the Treaty of Versailles indicated that "a first charge upon all the assets and revenues of the German Empire and constituent states shall be the cost of reparation", which "authorize clearly the use of the military arm in enforcing collection of the debt, without the consequences that might ensue from an actual state of war" (Smith (1924), p. 12). Either way, the occupation resulted in a reduction of Germany's export and production capabilities, with effects observationally equivalent to those of an export restriction leading to a fall in output and foreign currency supply.

**Sources:** Smith (1924), De Fiedorowicz (1936).

## C.10 The Petrich Incident (1925)

**Description:** The Incident at Petrich, or War of the Stray Dog, was a Greek-Bulgarian crisis resulting in a brief invasion of Bulgaria by Greece near the border town of Petrich. This followed the killing of a Greek captain on October 18th, 1925. On October 22nd Greece sent soldiers into Bulgaria with the goal of enforcing its financial compensation demands. Bulgaria appealed to the League of Nations to intervene in the dispute. The League 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 of the United Nations Security Council, discussed whether to impose economic sanctions on Greece on October 27th (Barros (1964), pp. 375-376).<sup>56</sup> Some members thought

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<sup>56</sup>The Council included four permanent members (Britain, France, Italy and Japan) and four (later nine) others elected by the General Assembly of the League for three years. The Secretariat prepared the agenda and published reports of meetings. The Council's main function was to settle international

that the Council should act decisively on the basis of Article 16 of the Covenant of the League, which allowed members to sever 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 dramatic response to the situation. Ultimately, the Council determined 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, eliminating the need for further steps.

**Source:** [Barros \(1964\)](#).

### C.11 The Guangzhou-Hong Kong Strike-Boycott (1925-1926)

**Description:** The Guangzhou–Hong Kong strike was a strike and boycott in British Hong Kong and China’s Guangzhou (Canton) from June 1925 to October 1926. It started as a response to shooting incidents on June 23rd, 1925 in the British concession of Guangzhou in which Chinese demonstrators were killed and wounded. The incident intensified anti-British sentiment and led to a general strike and rupture of commercial relations with the British, including a full embargo of Hong Kong lasting until October 1926.

**Economic sanctions:** In less than a month, the situation had grown into an effective general strike and boycott of Hong Kong. As the economy came to a halt, Hong Kong became like a ghost town, and its port was idle. On September 5th, sanctions against the British were tightened further. Trade along South China routes was entirely in non-British hands, undermining the UK’s economic position in the region. The general strike-boycott had major adverse effects on Hong Kong’s trade. The government realized that it had no choice but to work more closely with leaders of the Chinese community. On July 15th, 1926, negotiations between Guanzhou and Hong Kong for a strike-boycott settlement began. By mid-September, the Guanzhou regime made plans to end the strike-boycott unilaterally on October 10th. Protesters in Canton terminated the campaign because of the financial burden of supporting the strikers and to pacify the UK, which had taken steps towards military intervention.

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disputes.

**Source:** Global Nonviolent Action Database, Swarthmore College,  
<https://nvdatabase.swarthmore.edu>.

## C.12 The Mosul Dispute (1925-1926)

**Description:** The Mosul question was a territorial dispute between Turkey and Iraq over possession of the Mosul Vilayet. The Mosul Vilayet was part of the Ottoman Empire until the end of World War I, when it was occupied by Britain. After the Turkish War of Independence, the new Turkish Republic claimed possession of Mosul. Britain brought the issue to the international arena. The League of Nations Council appointed a commission that recommended that Iraq should keep Mosul. Turkey reluctantly signed the Treaty of Ankara (also known as Frontier Treaty) on June 5th, 1926 that aimed to determine mutually satisfactory borders, while Iraq agreed to give a 10 percent royalty on Mosul's oil deposits to Turkey for 25 years.

**Economic sanctions:** The dispute over Mosul was referred to the League of Nations' Council for arbitration. The British government saw economic sanctions as a tool to pressure Turkey should it not abandon its claims to the Vilayet. In December 1925, British officials began analyzing the prospects for economic sanctions against Turkey. A concern was that the Mosul dispute could lead to a war with Turkey, should the Permanent Court of International Justice rule in favour of Iraq and if Turkey then rejected the verdict. Another consideration was that since Turkey had long land borders it was relatively unexposed to maritime blockade. Moreover, Turkey depended only to a small extent on seaborne trade for hard currency earnings. Despite this, Foreign Secretary Neville Chamberlain gave the impression that the three European powers on the Council (Britain, France, Italy) would support economic sanctions if needed. This encouraged Turkey not to challenge the League and to accept the resolution of the Mosul dispute, which was resolved in June 1926.

**Sources:** [Mulder \(2022\)](#), [Keith \(1926\)](#).

## C.13 The ARCOS Affair (1927)

**Description:** On May 12th, 1927, British police raided the headquarters in London of the Soviet trade delegation and ARCOS (the All Russian Co-operative Society), searching

for documents allegedly stolen from the War Office. The raid was a breach of the Anglo-Soviet trade agreement of 1921 that gave diplomatic immunity to official trade agents of the USSR.<sup>57</sup>

**Sanctions:** The House of Commons endorsed the Government's proposal to suspend the Anglo-Soviet trade agreement and to suspend diplomatic relations with the USSR on May 26th, 1927. Concerns about war between the two countries increased. Russia took measures to minimise imports from Britain, curtailing both current orders and those projected under the impending Five Year Plan. At the same time, it sought to maintain Soviet sales to Britain at as high a level as possible, thereby shifting the balance of Anglo-Soviet trade in its favour. British officials initially paid no heed to the economic repercussions. Outstanding economic questions were settled in a new Anglo-Soviet trade agreement of April 16th, 1930 under the Second Labour Government.

**Sources:** Owen (1971), *The Rupture with Russia: Immediate Consequences and Ultimate Dangers*, July 1927, Pamphlet published by the Anglo-Russian Parliamentary, <https://cdm21047.contentdm.oclc.org/digital/collection/russian/id/6587>.

## C.14 The Mukden Incident (1931-1933)

**Description:** The Mukden Incident was a false flag event staged by the Japanese army as pretext for Japan's invasion of Manchuria in 1931. On September 18th, 1931, Japanese military personnel detonated a bomb near a railway line near Mukden (now Shenyang). The Japanese Army blamed Chinese dissidents and reacted with a full invasion that led to occupation of Manchuria and establishment of the puppet state of Manchukuo six months later. The deception was exposed by the Lytton Report of 1932, leading to Japan's withdrawal from the League of Nations in March 1933.

**Sanctions:** Whether Japan's invasion should be sanctioned was intensely discussed. US President Hoover addressed his cabinet on November 7th, 1931, with a statement in which he limited American action to "moral pressures" and ruled out economic and military sanctions as "roads to war." Secretary of State Stimson concurred as to the "danger of a blockade leading to war." (Current (1954), p. 520.) But with the continuation

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<sup>57</sup>The agreement signed on 16 March 1921 aimed to facilitate trade between the United Kingdom and the Soviet Union. It ended the British blockade and opened Russian ports to British ships. Both sides agreed to refrain from hostile propaganda. It amounted to *de facto* diplomatic recognition and opened a period of extensive trade.

of hostilities between China and Japan, Secretary Stimson was informed that the League of Nations would probably consider sanctions on November 17th. Stimson informed his Ambassador to the League that the US would “not interfere with it,” adding that there “might be a private embargo put on here by voluntary action in refusing to trade with Japan.” (Current (1954), p. 521.) However, President Hoover refused to reverse himself on US official participation to the embargo on November 27th, given increasing opposition in the Senate. On January 7th, 1932, Secretary Stimson declared that the US Government would not recognize any territorial or administrative changes the Japanese might impose upon China (a position known as the “Stimson doctrine”). The Senate rejected an embargo on January 31st, 1932 over concerns that it would lead to war and trade losses. The League of Nations instead took two steps (De Fiedorowicz (1936), p. 128). An arms embargo was imposed on February 27th, 1932 by the British Government, affecting the export of munitions to both Japan and China. And on March 11th, 1932, the League refused to formally recognize Japan’s conquests or the new State of Manchukuo — ultimately to no avail.

**Sources:** Current (1954), De Fiedorowicz (1936), New York Times Archives (“Boycott of Japan Opposed in Senate, 31 January 1932), US Department of State, “Stimson Doctrine, 1932”, <https://2001-2009.state.gov/r/pa/ho/time/id/16326.htm>.

## C.15 The Chaco War (1932-1935)

**Description:** The Chaco War was an armed conflict between Bolivia and Paraguay over the control of the Gran Chaco region that was believed to be rich in oil. A ceasefire was negotiated in June 1935, and a final truce treaty signed in 1938. Two-thirds of the Chaco region was given to Paraguay, the remaining one-third to Bolivia. During the war, both landlocked countries faced challenges in resupplying arms from their neighbours due to the imposition of multinational arms embargoes.

**Sanctions:** After the outbreak of the Chaco war in September 1932, an early Franco-British proposal for a League arms embargo against Bolivia and Paraguay was proposed to the Council in February 1933. But the latter was likely to be ineffectual so long as U.S. arms manufacturers remained outside the interdiction scheme. Bolivia and Paraguay’s neighbors applied diplomatic pressures to deescalate the conflict. Within the so-called A.B.C.-Peru group (Argentina, Brazil, Chile and Peru) and the group of Five Neutrals

(the US, Cuba, Colombia, Mexico and Uruguay), Argentina and Chile proposed an arms embargo in 1932, but no action was taken. The League of Nations also pressured both countries to cease hostilities, but its diplomatic efforts were unsuccessful. The League therefore created a special commission to investigate of the war. The Commission proposed a roadmap to peace on February 24th, 1934; this was rejected by both countries. The Commission then presented a formal report to the Council of the League, made public on May 12th, 1934, calling for an arms embargo on both countries. The embargo was applied by the A.B.C.-Peru group and the Five Neutrals, albeit with differing degrees of stringency. US President Roosevelt requested the Senate (on May 18th) and the House of Representatives (on May 20th) to approve a resolution to enforce the embargo, which was approved by both Houses on May 28th, 1934. By December 1934, 27 countries had banned weapon exports to Bolivia and Paraguay. League-sponsored armistice talks resulted in a ceasefire agreement, which only Bolivia accepted. The arms embargo on Bolivia was then lifted. Paraguay remained concerned that it might become the target of an Article 16 sanctions procedure and left the League in February 1935. However, the country's economy was too weakened to sustain the war, and on June 10th, 1935 a ceasefire was negotiated.

**Source:** [Fenwick \(1934\)](#), [De Fiedorowicz \(1936\)](#), *League of Nations Official Journal*, Special Supplement N. 124, Geneva, 1934, [Mulder \(2022\)](#).

## C.16 The Metro-Vickers Crisis (1933)

**Description:** The Metro-Vickers Affair was an international crisis triggered by arrest of six British employees of Metropolitan-Vickers (an electrical company), and their trial by Soviet authorities in April 1933 on charges of economic “wrecking” and espionage. The trial attracted international media attention, generated public outrage over presumed violations of legal process, and resulted in the conviction of the British employees.

**Sanctions:** Britain first increased economic pressure by breaking off negotiations for a new trade agreement with the USSR on March 20th, 1933. It threatened a commercial embargo should the arrested men be tried and convicted. This became official British policy on March 27th. The machinery to secure Parliamentary approval was set in motion on March 28th. With the trial ending on April 19th and the anticipated conviction of the defendants, a full embargo was imposed, to be effective one week afterwards, on

April 26th. The embargo applied to basic Soviet export commodities, goods which comprised 70-80% of the Soviet Union's trade with the UK. All punitive economic measures were then lifted on July 1st, with the simultaneous release of the imprisoned British engineers. Two days later negotiations for a new Anglo-Soviet trade agreement resumed.

**Source:** [Owen \(1971\)](#).

## C.17 The Anti-Nazi Boycott (1933-1941)

**Description:** The Anti-Nazi boycott was an international boycott of German products in response to violence and harassment by members of Hitler's Nazi Party against Jews following Hitler's appointment as Chancellor of Germany on January 30th, 1933.

**Sanctions:** The boycott began on March, 19th, 1933 in Europe and the US and continued until the entry of the US into the war on December 7th, 1941. Following the boycott, German imports to the US were reduced by nearly a quarter compared with the prior year, and the impact weighed heavily on the regime. But the Haavara Agreement together with German rearmament that lessened dependence on trade with the West by 1937 largely negated the effects of the Jewish boycott on Germany. Nevertheless, the boycott campaign continued into 1939. While supported by Anglo and American Jews, the boycott was never endorsed by the League of Nations or national governments.

**Source:** [Gottlieb \(1973\)](#).

## C.18 Italy's Invasion of Abyssinia (1935)

**Description:** On October 1935 Italy attacked Abyssinia (now known as Ethiopia) from Eritrea, an Italian colony, without prior declaration of war. After a series of military victories by the Italians, the Abyssinian emperor Haile Selassie was forced to escape into exile on May 2nd, 1936. The country was officially annexed to the Italian kingdom on May 7th. Fighting between Italian troops, Abyssinian troops and insurgency movements continued until February 1939.

**Sanctions:** Economic sanctions were imposed by the League of Nations between November 1935 and June 1936. They included five chapters: i) a ban on arms trade to both Italy and Ethiopia (adopted by the Co-ordination Committee on October 11th, 1935, amended October 16th, 1935); ii) exclusion from international debt and capital markets of the Italian state as well as companies and financial institutions resident in

Italy (adopted by the Co-ordination Committee on October 14th, 1935, amended November 2nd, 1935, and November 6th, 1935); iii) a prohibition of imports of Italian goods (adopted by the Co-ordination Committee on October 19th, 1935, amended November 2nd, 1935, and November 6th, 1935); iv) an export embargo to Italy of goods instrumental to the prosecution of the war (adopted by the Co-ordination Committee on October 19th, 1935, amended November 2nd, 1935 and November 6th, 1935); and v) suspension of all bilateral trade agreements between Italy and the League members (adopted by the Co-ordination Committee on October 19th, 1935). These sanctions came into force on November 18th, 1935. Adding coal, oil, pig iron, and steel to embargoed exports was discussed on November 2nd, 1935. The decision was deferred and on January 1936 the League abandoned completely the new sanctions proposal. On March 2nd 1936 the British Foreign Secretary proposed oil sanctions, but the proposal failed on divisions between the British delegation and the French cabinet. The Co-ordination committee of the League proposed at a meeting on July 6th 1936 to lift all measures by July 15th. Its proposal was accepted by all Governments.

**Sources:** [Ristuccia \(2000\)](#), *League of Nations Official Journal*, Special Supplement N.150, Geneva, 1936.

## C.19 Mexico's Expropriation Dispute (1937-1943)

**Description:** On March 18th, 1938 the Mexican government expropriated the assets of foreign oil companies and created a state-owned firm, *Petróleos Mexicanos (PEMEX)*, to run the Mexican oil industry. The decision came after a decade of turmoil for the Mexican oil industry, with soaring profits and stock prices that facilitated the acquisition of national oil companies by foreign multinationals. By 1937 about 78% of Mexican production was controlled by US or British corporations. Lower profits also exacerbated tensions with workers, leading to strikes and protests. US firms reacted by lobbying the US government to impose sanctions on Mexico and force it to return expropriated assets or pay compensation.

**Sanctions:** On March 26th, 1938, Secretary of State Hull sent a letter to the Mexican Government announcing his intention of suspending the Silver Purchase Act of 1934. Under the Act, the US government was committed to fixed annual purchases of silver from Mexico (until silver stocks reached 25% or a price of USD 1.29 an ounce). Hull also

threatened to reduce the silver support price from 0.45 to 0.43 an ounce. For Mexico, revenues from the Silver Act accounted for about twice as much as revenues from oil taxation. On January 27th, 1939, Senator McReynolds proposed creating a commission to investigate the expropriation. Senator McReynolds also proposed a bill to the US Senate calling for an end to the Silver Purchase Act. The bill was never voted on but remained on the Senate floor as a means of economic pressure. Ultimately, opposition from the Treasury Department eventually forced Hull and the State Department to back down. US oil companies fought the expropriation by making extravagant demands for compensation which the Mexicans rejected. After the outbreak of World War II, the US Government pressured the oil companies to accept a settlement. On April 18th, 1942, the US and Mexican Governments finally signed an agreement whereby the Mexicans agreed to pay financial compensation to US oil firms.

**Sources:** Maurer (2011); *Congressional Senate Records*, January 27, 1939 Vol. 84, Part 1, "Mexican Expropriation of Foreign Oil, 1938", US Department of State, <https://history.state.gov/milestones/1937-1945/mexican-oil>.

## C.20 Blockades of Germany and Italy (1939–1945)

**Description:** The Blockade of Germany (or Economic War) consisted of restrictive measures by the UK to limit supplies of goods needed by Germany and subsequently Italy to sustain their war efforts. The economic war consisted of a naval blockade, import restrictions on German goods and the preemptory purchases of war materials from neutral countries to prevent their sale to the Axis powers.

**Sanctions:** On September 4th, 1939, the UK declared that all merchant vessels were now liable to examination by the Naval Contraband Control Service. Although a blockade was not formally declared, the communiqué listed the goods liable for confiscation if carried, such as foodstuffs, animal feed, forage, clothing, and articles—items known as Conditional Contraband of War. Moreover, Absolute Contraband included: all ammunition, explosives, chemicals or appliances suitable for use in chemical warfare; fuel of all kinds and all contrivances for means of transportation on land, in water or the air; all means of communication, tools, implements and instruments necessary for carrying on hostile operations; coin, bullion, currency and evidences of debt. Britain also imposed a selective blockade on Italy. Coal was declared contraband, though Italy re-

mained non-belligerent until June 10th, 1940. On December 4th, 1939, the UK started limiting German exports in retaliation for the damage and victims caused by the German war operations. Although this negatively affected the neutrals, British officials believed that German sea trade could be reduced sizeably by the measure, impairing Germany's access to essential goods, foreign currency and gold. Germany attempted to maintain imports with neighbouring neutral countries with which it continued to trade and barter. Neutrals secretly acted as a conduit for supplies of materials that would be confiscated if sent directly to Germany. In April, Britain began strengthening the Mediterranean Fleet to enforce the blockade. On August 17th, 1940, after the invasion of France, Germany announced a general counter-blockade of the UK. On August, 20th, 1940, Italy announced a blockade of all British ports in the Mediterranean.

**Source:** Neutrals and Naval Economic Warfare, *Bulletin of International News*, Vol. 16, No. 20 (Oct. 7, 1939), pp. 3-7, <https://www.jstor.org/stable/25642576>, "Total Blockade to End Nazi Trade", *New York Times*, December 5th, 1939, <https://www.nytimes.com/1939/12/05/archives/total-blockade-on-to-end-nazi-trade-allied-control-ships-at-posts.html?searchResultPosition=8>.

## C.21 US Wartime Embargoes on Japan (1940-1945)

**Description:** Japan's expansion in Asia and the Pacific with the onset of World War II led the US to impose a series of economic sanctions. Tensions between the two countries intensified, culminating with the attack on Pearl harbour on December 7th, 1941 and the entry of the US into the global conflict.

**Sanctions:** Japan's War with China of 1937 and the Nanking massacre led the US to impose a "morale" (non-binding) embargo on the sale of airplanes and related material to nations using airplanes to attack civilian populations. The embargo was extended in 1939 to material essential to airplane manufacture and the production of aviation fuel. However, Japan's position under its 1911 Treaty of Commerce with the US precluded the adoption of retaliatory measures against Japanese commerce that were legally binding. The US withdrew from the Treaty in July 1939 in order to lift that legal obstacle. In response to Japan's further expansion in Asia, the US used the Export Controls Act to embargo scrap-metal shipments to Japan on July 2nd, 1940. The US froze Japanese assets on July 26, 1941, and on August 1st, 1941 imposed an embargo on oil and gasoline exports

to Japan. The oil embargo was an especially strong response because oil was Japan's most crucial import, a sizeable share thereof being sourced from the US. Concerns about oil shortages are believed to be among the reasons that encouraged Japanese authorities to attack Pearl Harbour.

**Source:** US State Department, Office of the Historian,  
<https://history.state.gov/milestones/1937-1945/pearl-harbor>.

## C.22 Sanctions on Peron's Argentina (1944-1947)

**Description:** At the outset of World War II Argentina announced its intention of remaining neutral. However, the country had long-standing relations with Germany, including a large population of German origin. The Allies gathered intelligence that Argentina supported the Axis trade network (e.g. its acquisition of industrial raw materials) and the funding of the German state. The US administration hesitated to freeze Argentinian assets, however. When the US gathered evidence that the Argentinian regime was responsible for the overthrow of the Bolivian government (in December 1943) and was plotting similar coups in other South American countries, with Germany's support, sanctions were imposed. One year later, Argentina was among the countries investigated in "Operation Safehaven," which aimed at uncovering German attempts to move assets to neutral countries, so as to lay the basis for a resurgent Nazi state after Hitler's military defeat.

**Sanctions:** On January 24th, 1944, the US ambassador to Buenos Aires informed the Argentine government that the US administration would freeze Argentinian assets in the United States if the country did not sever all relations with the Axis. After an initial positive response to the ultimatum by President Ramirez, it became clear that the Argentinian government had no intentions of severing relations with Germany once Colonel Peron took power (in February 1944). Therefore, between August and November 1944, the US government introduced additional sanctions against Argentina (freezing over \$400 million of Argentine gold; ordering a deep cut in export licenses for chemicals, steel and lumber exports to Argentina; and forbidding US ships from landing at Argentine ports after October).

**Source:** US State Department, *Allied Relations and Negotiations With Argentina*,  
[https://1997-2001.state.gov/regions/eur/rpt\\_9806\\_ng\\_argentina.pdf](https://1997-2001.state.gov/regions/eur/rpt_9806_ng_argentina.pdf).

## D Foreign Exchange Data

The paper mainly relies on the weekly foreign-exchange dataset compiled by [Vicqu ery \(2022\)](#) for the period 1918-1939, based on digitisation of foreign-exchange prices quoted or reported in London. When available, during episodes of capital controls, the unofficial (black market) prices quoted in London are used. The dataset in [Vicqu ery \(2022\)](#) however does not cover several sanctioned countries of interest. Where available, we use data from a commercial provider, Global Financial Data (GFD), to fill in gaps<sup>58</sup>. Furthermore [Vicqu ery \(2022\)](#) does not cover World War periods, when the London foreign-exchange market became less active on the back of temporary closures of financial exchanges, capital controls and the exclusion of some belligerent countries. Hence we digitise new data on the Swiss foreign-exchange market to cover foreign-exchange developments during World War periods and to better capture several episodes of peace-time capital controls. For World War I, we employ GFD data for most countries as the baseline, as the geographic coverage of the Swiss market remains limited. For World War II, Swiss market prices are employed when available, with a preference for black market quotes. The dataset employed in the analysis ends in September 1944, when the Swiss black market stops being quoted. [Appendix D.1](#) provides further detail on our approach to foreign-exchange data during World Wars and the original data digitised for this paper. [Appendix D.2](#) provides detailed sources by sub-period for each polity in the sample.

### D.1 The Swiss Foreign-Exchange Market 1914-1944

We digitise new foreign-exchange series for the whole Swiss market in selected periods (1914-1920 and 1935-1945), as reported in weekly tables in *Der Bund*, a Swiss German-speaking newspaper published in Bern.<sup>59</sup> An overview of how the new data compares to the other available sources and how we employ them in the analysis is available below. For additional treatment of the role of the Swiss franc and foreign-exchange black market in Switzerland during World War II, see [Independent Commission of Experts \(2002\)](#) and [Hileman \(2017\)](#).

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<sup>58</sup>When bridging two different data sources for the same currency, prices are converted into the contemporary currency unit.

<sup>59</sup>We digitise the table for every Thursday or the closest day of the week when unavailable.

### D.1.1 World War I

The outbreak of World War I resulted in the closure of global financial exchanges for a protracted period. As the London market became less active during the war, both the New York and Swiss markets attracted significant foreign-exchange activity. Both financial centers quoted only a handful of currencies before 1914, compared to a dozen reported in the financial press as soon as 1915. Even though detailed metadata are not available, the data from GFD seem to refer to the New York market. GFD allow us to cover slightly over half of our sample during World War I.<sup>60</sup> This compares to the thirteen currencies we are able to cover in our original dataset covering the Swiss foreign-exchange market between 1914 and 1920. While our original data also include black market “banknote” prices in Switzerland, it is important to note that, during World War I, this parallel market does not exhibit meaningful deviations from prices observed on the telegraphic market in both New York and Switzerland, while appearing less active. We therefore use GFD as the baseline data source for the World War I period.<sup>61</sup> A version of the dataset replacing GFD with our original Swiss foreign-exchange series for the available currencies yields very similar empirical results, which are provided in the robustness section.

### D.1.2 Interwar Black Markets and World War II

Our original Swiss data however much better reflect some of the economic realities of the foreign-exchange market starting in the 1930s compared to both GFD and the London market data digitised by [Vicquéry \(2022\)](#). We digitise all the Swiss foreign-exchange market data reported in *Der Bund* from 1935 onward, as black and parallel markets in several European currencies became active. Very significant deviations between official market and parallel or black market prices appear as soon as the mid-1930s for the Deutsche mark, the Italian lira and the Hungarian pengoe. A similar phenomenon can be observed on the Swiss market for the currencies of all belligerent countries at the end of 1939. Additionally, as the United States started to provide assistance to the Allies in the late 1940, including by freezing Axis and neutral countries assets in US dollars, the Swiss franc increasingly became the only freely convertible currency globally. This

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<sup>60</sup>It should be noted that several polities in our sample became independent only in the aftermath of World War I.

<sup>61</sup>The Swiss market however allows us to observe the price of the rouble until 1918.

makes our new dataset uniquely suited to assess the impact of economic sanctions on the exchange-rate, as the Swiss market and the franc became essential to the settlement of international transactions between belligerent and neutral countries as well as the only market where “free” prices of currencies can be observed. The report by the [Independent Commission of Experts \(2002\)](#) on the Swiss gold market during World War II notes how war efforts of both the Allies and the Axis benefited, through different channels, from the free convertibility of the Swiss franc. Only in September 1944 did a resolution of the Swiss Banking Association, possibly resulting from British and American moral suasion, ban trading in foreign currency banknotes ([Hileman, 2017](#)). As foreign-exchange black markets stop being reported in the financial press at the same date, we also end our sample in September 1944.

Our approach in terms of data sources when transitioning from the interwar to World War II therefore consists in using London market prices until the beginning of World War II, except for currencies already exhibiting significant discounts on the Swiss black market, for which Swiss parallel or black market prices are used as soon as available. After September 1939, we use black market or—if no black market is active— official market prices in Switzerland, if available, or otherwise GFD. It is important to note that we therefore observe a segmented foreign-exchange market, where some currencies, typically the ones experiencing the most extreme capital control activity, are quoted in a “free” black market, while others are quoted in a heavily managed official market. As the estimating dataset is expressed in US dollars, this means that Swiss foreign-exchange market prices, quoted in Swiss francs, are converted into dollars using the cross of the US dollar “cable” official price for non black-market currencies and the cross of the “free” US dollar exchange rate in Switzerland for black market currencies.

## D.2 Detailed Foreign-Exchange Data Sources by Polity

**Argentina:** Global Financial Data (1914-1917), [Vicqu ery \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**Austria:** Global Financial Data (1914-1917), [Vicqu ery \(2022\)](#) (1918-1938). Stops being quoted following the Anschluss in March 1938. Alternative 1914-1917 Swiss market quotes from Der Bund tested as robustness.

**Belgium:** Global Financial Data (1914-1917), [Vicqu ery \(2022\)](#) (1918-1939), Der Bund

(1939-1940). Stops being quoted following the outbreak of World War I and the German invasion in May 1940. Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Bolivia:** Global Financial Data (1921-1944).

**Brazil:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**Bulgaria:** Global Financial Data (1916-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**Canada:** [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**Chile:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Global Financial Data (1939-1944).

**China:** [Vicquéry \(2022\)](#) (1918-1939), Global Financial Data (1939-1944).

**Colombia:** Global Financial Data (1921-1944).

**Czechoslovakia:** [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). From September 1939 onward Swiss market black market price.

**Danzig:** [Vicquéry \(2022\)](#) (1934-1939).

**Denmark:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Estonia:** [Vicquéry \(2022\)](#) (1924-1939).

**Finland:** [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**France:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). From September 1939 onward Swiss black market price. Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Germany:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1934), Der Bund (1935-1944). Between July 1935 to June 1938 the blocked mark (*kreditsperrmark*) price on the Swiss market is used, Swiss black market price afterward. Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Greece:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**Hong Kong:** Global Financial Data (1914-1915), [Vicquéry \(2022\)](#) (1918-1939), Global financial Data (1939-1944).

**Hungary:** [Vicquéry \(2022\)](#) (1918-1936), Der Bund (1936-1944). Swiss black market price between April 1936 and May 1940.

**India:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Global Financial Data (1939-1944).

**Italy:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1935), Der Bund (1935-1944). Swiss black market price from May 1935 onward. Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Japan:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**Lithuania:** [Vicquéry \(2022\)](#) (1925-1939).

**Mexico:** [Vicquéry \(2022\)](#) (1918-1939), Global Financial Data (1939-1944).

**Netherlands:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). Swiss black market price from September 1939 until June 1940. Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Norway:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Paraguay:** Global Financial Data (1920-1944).

**Peru:** [Vicquéry \(2022\)](#) (1918-1939), Global Financial Data (1939-1944).

**Poland:** [Vicquéry \(2022\)](#) (1920-1939). Stops being quoted following the German invasion in September 1939.

**Portugal:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944).

**Romania:** [Vicquéry \(2022\)](#) (1920-1939), Der Bund (1939-1944).

**Russia:** Der Bund (1914-1918), [Vicquéry \(2022\)](#) (1924-1939).

**Spain:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Global Financial Data (1939-1944).

**Sweden:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Switzerland:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). Alternative 1914-1917 Swiss market quote from Der Bund tested as

robustness.

**Thailand:** Global Financial Data (1914-1944).

**Turkey:** [Vicquéry \(2022\)](#) (1921-1939), Global Financial Data (1939-1944).

**United Kingdom:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). Swiss black market price from September 1939 onward. Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**United States:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1918-1939), Der Bund (1939-1944). Swiss black market price from October 1939 onward. Alternative 1914-1917 Swiss market quote from Der Bund tested as robustness.

**Uruguay:** Global Financial Data (1914-1917), [Vicquéry \(2022\)](#) (1921-1939), Global Financial Data (1939-1944).

**Yugoslavia:** [Vicquéry \(2022\)](#) (1920-1939), Der Bund (1939-1941). Stops being quoted following the Axis invasion in April 1941.