Sanctions and Currencies in Global Credit

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Abstract

This paper studies how financial sanctions affect the allocation of cross-border credit, the dominance of the U.S. dollar in global credit markets and, ultimately, the oversight of hegemonic powers over global financial intermediation. We focus on a unique laboratory: the 2014 EU-U.S. sectoral sanctions against Russia. We document how, despite the absence of currency-specific restrictions, the U.S. dollar share of global banking claims on Russia fell from 65 percent to 25 percent between 2014 and 2021, while the euro share rose from 20 percent to 45 percent. Combining firm, bank, and loan-level data, we show that this de-dollarisation reflected currency-specific de-risking by global banks, arising from higher sanction-compliance costs in the dollar payment system.

Our analysis proceeds in three steps. First, we show that euro-denominated claims rose entirely among non-sanctioned Russian firms, ruling out sanction avoidance as an explanation for the euro shift. Second, confidential data on the universe of cross-border claims of UK-resident banks allow us to disentangle jurisdictional and currency-specific de-risking. Banks with ultimate parents in sanctioning jurisdictions reduced claims on Russia by 50 percent relative to other banks. However, all banks—regardless of ultimate-parent jurisdiction—increased non-dollar, and particularly euro, claims relative to dollar claims by up to 400 percent. Third, we turn to prices and quantities in the Russian syndicated-loan market. After 2014, dollar loans to Russian borrowers carried a settlement-risk premium of about 50 basis points relative to comparable euro loans. Together with a large positive shift in euro loan volumes, this points to high substitutability between vehicle currencies in global credit. Finally, we provide a capital-flows perspective on geoeconomic power. We show that U.S. coalition control over Russian claims rested mainly on the use of the dollar by non-U.S. banks before 2014 and fell substantially thereafter. Our results show how the coercive use of a hegemonic currency can redirect private intermediation toward alternative vehicle currencies, thereby endogenously weakening hegemonic financial power.

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Key Words: Dollar Dominance; Financial Sanctions; Vehicle Currencies; De-Dollarisation; Cross-Border Payments; Capital Flows.

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1 Introduction

In a 2016 speech taking stock of the new U.S. approach to economic and financial sanctions under the Obama administration, then–Treasury Secretary Jacob Lew cautioned that while "economic sanctions have become a powerful force in service of clear and coordinated foreign policy objectives," their "overuse (...) could threaten the central role of the U.S. financial system globally, not to mention the effectiveness of our sanctions in the future."[1] In recent years, this concern has resurfaced among U.S. policymakers,[2] prominent scholars and market participants,[3] and even the President of the United States.[4]

The tension underlying these debates has since been formalised in a growing literature on geoeconomics. Clayton, Maggiori, and Schreger (2025a) describe how economic sanctions have become a central instrument of U.S. geoeconomic power—defined as the ability of a hegemonic state to leverage control over strategic sectors to enforce compliance abroad. Clayton, Maggiori, and Schreger (2025b) argue that U.S. geoeconomic power stems primarily from its dominance in financial services and highlight a fundamental trade-off: the use of geoeconomic power by an hegemon encourages the adoption of anti-coercion policies, reducing their dependence on the hegemon.

In this paper, we empirically study how uncertainty about future coercive actions by the hegemonic power shapes the allocation of cross-border credit, the use of vehicle currencies in global financial markets and, ultimately, the degree of oversight that the hegemon can maintain over global financial intermediation. We leverage a unique institutional setting created by a policy shock: the 2014 Western *sectoral* financial sanctions imposed on Russia. In the aftermath of the 2014 invasion of Crimea, the EU and the U.S., alongside other Western countries, restricted the ability of a select group of large Russian firms, mainly in the energy and financial sectors, to access *new* credit from Western banks. Crucially, these 2014 sectoral sanctions, which remained in place until the full-scale invasion of Ukraine in 2022, stopped short of generalised stricter measures such as asset freezes or full blocking, and continued to allow cross-border lending to the vast majority of Russian firms. This episode provides an ideal setting to examine how uncertainty over future sanctions and sanction compliance risk affect the supply of international credit and its currency composition, as global banks and borrowers adapted their behaviour to limit exposure to potential coercive actions.

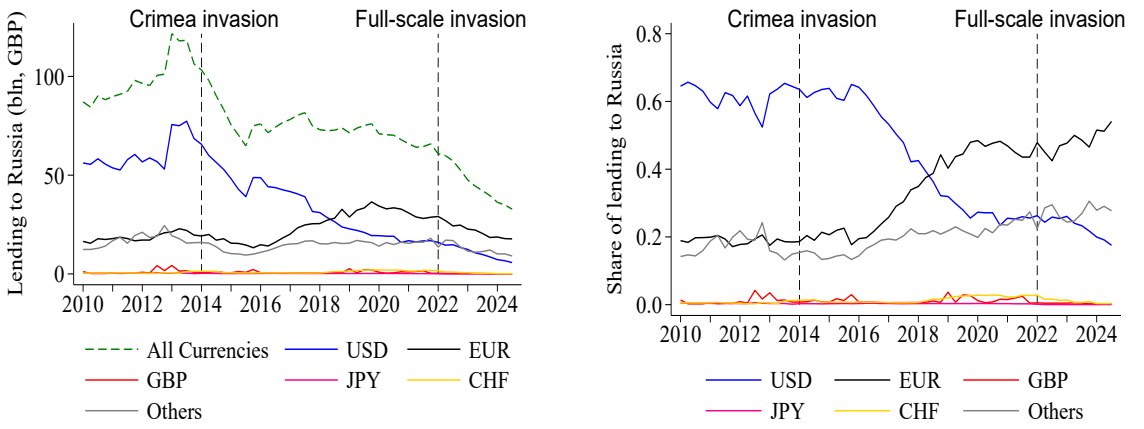
As shown in Figure 1, global cross-border lending to Russia fell sharply following the 2014 sectoral sanctions. Yet a striking pattern emerges in its currency composition. Although the sanctions were largely symmetrical between the EU and the U.S. and contained no currency-specific provisions, dollar-denominated lending to Russia declined more than three-fold between 2014 and 2021, while lending in euros increased over the same period. Specifically, the share of cross-border claims on Russia denominated in euros, as reported by the BIS, rose from about

[1] See The Evolution of Sanctions and Lessons for the Future, Remarks at the Carnegie Endowment for International Peace by U.S. Treasury Secretary Jacob Lew, March 30, 2016. Fishman (2025) provides an insightful discussion of internal debates within the U.S. Treasury on these issues during the Obama administration.

[2] *Yellen Says Sanctions May Risk Hegemony of U.S. Dollar*, Barron's, April 16, 2023; *Russia Sanctions Threaten to Erode Dominance of U.S. Dollar, Says IMF*, Financial Times, March 31, 2022.

[3] Dooley et al. (2022), Eichengreen (2022b), Frankel (2023), and James et al. (2022).

[4] *Remarks at the Economic Club of New York by President Donald J. Trump*, September 5, 2024.



(a) Total lending and currency breakdown

(b) Shares of lending by currency

Figure 1: Global Cross-Border Lending to Russia by Currency

Note. – Amount outstanding of total cross-border claims including all counterparty sectors, all currency types of reporting country, all types of instruments, all parent countries, all reporting institutions and countries. Lending converted from USD into GBP using quarterly averages of spot FX reported by the Bank of England. Proportion of each currency group out of total lending to Russia is in simple shares from 0 to 1.

Source: BIS locational banking dataset.

20 percent before 2014 to roughly 45 percent by 2022, whereas the share of U.S.-dollar claims fell from around 65 percent to 25 percent.

What drove this shift from dollars to euros in the denomination of credit flows? We argue that sectoral sanctions imposed by a coalition of states, combined with a hegemon's extra-territorial oversight over the use of its currency, generate two distinct frictions: a jurisdictional friction and a currency-specific friction.

On the one hand, banks headquartered in sanctioning jurisdictions face higher expected compliance costs when transacting with firms or jurisdictions already subject to partial sanctions, where uncertainty about the ultimate beneficiary or future sanction status is material. They therefore reduce exposures more than banks based elsewhere, consistent with classical compliance de-risking.

On the other hand, the U.S. exercises extra-territorial jurisdiction over dollar-clearing under a strict-liability regime for USD correspondent banks. When transactions involve counterparties whose compliance status cannot be verified with sufficient confidence, USD correspondent banks face non-trivial legal and financial exposure, and may become reluctant to process such payments, severing relationships (Matvos & Neiman, 2026). This can create settlement risk on dollar-denominated claims, as payments may not be executed if compliance risk cannot be absorbed by correspondent banks. This mechanism induces currency-specific de-risking by all banks, including those outside sanctioning jurisdictions.

Our analysis proceeds in three main steps, leveraging firm-, bank- and loan-level data. First, we rely on Capital IQ firm-level balance sheet data, covering a large sample of Russian firms, to show that the increase in euro claims was unambiguously driven by non-sanctioned

Russian firms. This rules out sanction-avoidance motives for euro-denomination of Russian claims as a meaningful contributor to the aggregate patterns motivating our study. We also show that, although all firms, regardless of their sanctioning status, reduced their debt levels, firms under sectoral sanctions experienced a stark deterioration of their debt burden, driven by higher interest payments.

Second, we disentangle the effect of jurisdiction and currency-specific frictions in the evolution of global claims on Russia after the 2014 sectoral sanctions. We rely on a confidential administrative dataset covering the universe of cross-border claims of UK-resident banks, including foreign branches and subsidiaries, broken down by currency of denomination. We begin by providing a detailed decomposition of UK-residents claims on Russia, showing that their euroisation was driven by banks previously lending to Russia in U.S. dollars from both sanctioning and non-sanctioning jurisdictions. We then quantify empirically that banks whose ultimate parent was based in a sanctioning jurisdiction reduced total claims on Russia by about 50% relative to banks ultimately based in a non-sanctioning jurisdiction, across all currencies. Relative to their claims on all other destinations, the corresponding decline in total claims on Russia is about 35%. However, all banks, regardless of their ultimate parent's nationality, de-dollarised the currency denomination of their Russian claims. Relative to claims in U.S. dollars, claims in all non-USD currencies increased by about a factor of 2.4 to 4, while euro-denominated claims increased by about a factor of 3.5 to 7.5. These shifts are positive for banks in both sanctioning and non-sanctioning jurisdictions. They are numerically larger for banks ultimately based in non-sanctioning jurisdictions, but the difference between the two groups is not statistically significant. Furthermore, we provide evidence of de-dollarisation spillovers driven by banks exposed to Russian sectoral sanctions. We show that banks with Russian claims in the quarter before the invasion of Crimea, especially those whose ultimate parent was based in a sanctioning jurisdiction, denominated more of their non-Russia claims in euro relative to U.S. dollars. This spillover is concentrated in destinations less aligned with the West, while we find little systematic evidence that these banks reduced overall claims to non-Russia destinations.

Third, we assess how prices and quantities of syndicated loans to Russian non-sanctioned firms reacted to these same jurisdiction and currency frictions following the 2014 sectoral sanctions. We rely on Dealscan loan-level data for the universe of syndicated loans to emerging markets to disentangle quantity and price responses. We find strong evidence of a settlement-risk premium on U.S. dollar loans to Russian borrowers, relative to the euro: in our preferred specification, within the same borrower dollar loans are priced about 55 bps higher than comparable euro loans, equivalent to a 19 percent decline in relative euro–dollar pricing. The same excercise reveals that syndicated lending volumes in euro increased by about 95%, relative to dollars. Combining these quantity and price responses implies a reduced-form EUR-USD substitution elasticity of about 3 to 5, suggesting substantial substitutability between vehicle currencies in global credit markets. Looking at jurisdiction-specific shifts, we find evidence in favour of a relative de-risking of sanctioning coalition banks on the extensive margin only, with no differential behaviour in loan pricing for coalition and non-coalition banks. This suggests a quantity adjustment of sanctioning coalition banks severing relationships with higher compliance-risk borrowers.

Finally, we connect our findings with the growing literature on geoeconomic power and the drivers of global economic fragmentation. We provide a capital flows-based measurement of hegemon-controlled financial inputs, relying on BIS data on global banking flows by currency, both on a residence and a nationality basis. We show that this approach is a relevant complement to measures relying on financial services trade data. It notably allows to disentangle three sources of hegemonic control over financial intermediation, derived from the empirical findings in our paper: i) the hegemon's oversight on its own banks, ii) its indirect oversight over banks from allied countries, and iii) its oversight on the use of the global hegemonic currency. We apply this framework, which is easily extendable to all countries covered by BIS data, to the Russian case-study. According to our measure, most of the U.S. coalition control over claims on Russia before 2014 came from the use of the U.S. dollar by non-American banks. The share of claims on Russia controlled by the American coalition then declined substantially after 2014, from close to 100% to about 74% at the end of 2021. Importantly, the decline in claims controlled via dollar usage was partially offset by an increase in the share of claims by banks under coalition jurisdiction in other currencies.

We now turn to a review of the related literature. Then the paper is organised as follows. Section 2 summarises the financial sanctions enacted by the U.S. and the EU between 2014 and 2021, and highlights the currency-specific sanction compliance costs embedded by U.S. oversight on correspondent banks and the U.S. dollar payment system. Section 3 describes our data. Section 4 provides firm-level evidence on the debt profile and currency composition of Russian firms under sectoral sanctions. Sections 5 and 6 empirically assess the relevance of jurisdiction and currency-specific frictions introduced by the 2014 sectoral sanctions by leveraging, respectively, a confidential bank-level panel covering the claims of UK resident global banks by currency, and the universe of syndicated loans to emerging markets. Section 7 discusses our results in the context of the literature on geoeconomics and the measurement and dynamics of geoeconomic power. Section 8 concludes.

Related Literature

Our paper relates to a growing literature studying the effect of economic and financial sanctions, the interplay between geopolitics, global capital flows, the international monetary system and, finally, the use of coercive economic measures by global hegemonic powers.

Economics of Sanctions There has been a growing interest in the effect of sanctions as a central tool in international relations, particularly looking at the successive sanctioning regimes against Russia since 2014 (Ahn & Ludema, 2020; Besedeš et al., 2021; Corsetti et al., 2024; Crozet & Hinz, 2020; Egorov et al., 2025; Gehring, 2022). Focusing on financial sanctions, a large body of literature has studied their effect on macroeconomic dynamics and financial markets (Bianchi & Sosa-Padilla, 2024; Eichengreen et al., 2024; Ghironi et al., 2023; Itskhoki & Mukhin, 2023; Lorenzoni & Werning, 2023; Minesso et al., 2025). In contrast, our paper focuses on how the *risk* of coercive actions influences the allocation of international capital flows and the use of vehicle currencies in international finance, leveraging several granular datasets.

Closely related to our paper is the work of Efing et al. (2023), who study the effect of finan-

cial sanctions on the cross-border supply of credit by German banks and their foreign affiliates, relying on a granular administrative dataset on German banks' cross-border claims. Similarly to our paper, they study sanctions-induced de-risking of international financial activities, focusing on the role of German banks' subsidiaries in jurisdictions with weaker compliance enforcement. Our paper uniquely considers the currency dimension of sanction-compliance risk by systematically studying the currency composition of firms balance-sheets, bank cross-border claims and syndicated loans. Furthermore, by leveraging a granular administrative dataset covering the universe of London-based banks, we are able to disentangle sanctions-induced shifts for banks across both sanctioning and non-sanctioning jurisdictions, on an ultimate-parent basis.

In another closely related contribution, Matvos and Neiman (2026) study how financial sanctions affect banks' access to the global payments network. They show that sanctions sever correspondent banking relationships, and hence the ability to directly access clearing in major currencies and, particularly, the U.S. dollar, while inducing a reconfiguration of payment networks towards alternative arrangements. Although they study the effect of post-2022 financial sanctions on Russia, the payment system frictions they describe are precisely the mechanism underlying relative currency shift and de-dollarisation of claims on Russia in our paper: the key role of correspondent banks in dollar clearing is what embeds a U.S. government global jurisdiction on dollar transactions, including credit flows, and therefore implies higher sanction compliance risk in dollar vs. non-U.S. dollar currencies in high-geopolitical risk jurisdictions.

In other related work, Keerati (2022) studies the differential impact of the 2014 financial sanctions on sanctioned and non-sanctioned Russian firms, with some overlap in the datasets we employ.[5] Similarly, Mamonov et al. (2022) study the consequences, and anticipation effects, of the 2014 financial sanctions on the balance-sheets of Russian sanctioned and non-sanctioned banks. In Section 4 we also analyse Russian firm-level data and at the differential evolution of sanctioned and non-sanctioned Russian firms after the 2014 invasion of Crimea. However, we chiefly focus on debt-levels and, uniquely, relative to the existing literature, the currency composition of Russian firms' liabilities. Furthermore, although the firm-level analysis is informative for the interpretation of our broader empirical evidence, the focus of this paper is chiefly on vehicle currency choice and allocation of credit by *global* banks to *non-sanctioned* Russian firms.

The effect of sanctions on the use of the dollar as a vehicle currency has already received some empirical attention in an international trade context, focusing on the invoicing currency of goods trade. Berthou (2023) provides evidence of de-dollarisation of French trade with Russia after the 2014 invasion of Crimea, looking at French granular customs data. In parallel work, Chupilkin et al. (2023) rely on Russian customs data and focus on the de-dollarisation effect on trade invoicing of the 2022 sanctions, following the full-scale invasion of Ukraine. From a theoretical perspective, Bianchi and Sosa-Padilla (2024) study how international financial sanctions can reduce the convenience yield on dollar assets. Our paper is, to our knowledge, the first study of the effect of sanction *risk* on the use of vehicle currencies in financial flows, relying on bank-level and loan-level data from a global, nationality-basis, perspective.

[5] We also rely on DealScan data to observe Russian and emerging-markets syndicated loans, although we look at a different firm-level balance-sheet dataset, Capital IQ, that allows us to observe the currency composition of the capital structure.

More broadly, our paper relates to the literature on the determinants of currency choice in international finance (Clayton et al., 2024; Hale et al., 2020; Lewis & Xie, 2025; Maggiori et al., 2019, 2020). We show that sanction-compliance risk can itself be an important determinant of currency denomination, inducing substitution away from the U.S. dollar and towards alternative vehicle currencies.

Geoeconomics, Capital Flows and the International Monetary System Our work also speaks to a growing literature studying the interplay between geopolitical risk and changing patterns in international capital flows and the international monetary system (Arslanalp et al., 2022; Arvai et al., 2026; De Haas et al., 2025; Eichengreen et al., 2019; Emter et al., 2026; Goldberg & Hannaoui, 2024; Koosakul et al., 2024; McDowell, 2023; Niepmann & Shen, 2025; Pflueger & Yared, 2024; Reinhardt et al., 2025; Vicquéry, 2022) as well as the, so far under-appreciated role, of cross-border payment systems (Cipriani et al., 2023; Eichengreen, 2022a; Ferrari Minesso et al., 2025). Our work also directly contributes to a growing literature on geoeconomics, studying the strategic use by hegemonic powers of the economic strength they derive from financial and trade relationships (Broner et al., 2025; Clayton, Coppola, et al., 2025a, 2025b; Clayton, Maggiori, & Schreger, 2025a, 2025b; Liu & Yang, 2025; Mayer et al., 2025). Closely related to the questions we analyse, Clayton, Maggiori, and Schreger (2025a) quantify the sources of US geoeconomic power, showing it mostly relies on dominance in financial services, and the US dollar payment system in particular. They also provide a framework to think about anti-coercion strategies and their general equilibrium implications in terms of economic fragmentation. Our paper is, to our knowledge, the first attempt to empirically relate an erosion of dollar dominance in international financial flows to the oversight exerted by the U.S. on the dollar payment system, and the global extra-territorial compliance-risk it implies. We focus on an ideal setting in this respect, the 2014-2021 sectoral sanctions on Russia, where the U.S. and the EU imposed lending restrictions only on a sub-set of Russian borrowers in global credit markets. This allows us to precisely analyse *risk* of future coercive actions and its implications in terms of global economic fragmentation. We show that financial sanctions operate by introducing both jurisdiction and currency specific frictions, via the dollar payment system. We bring these empirical insights to the macro literature on geo-economic power by proposing a capital-flows based measurement of the share of inputs controlled by the hegemonic power, derived from our empirical analysis.

2 Jurisdiction and Currency Frictions in the 2014 Financial Sanctions on Russia

Why did cross-border financial flows to Russia after 2014 shift away from the U.S. dollar and increasingly relied on the euro? A natural explanation would be differences in the scope of Western sanctions. Yet, the sanctioning measures adopted by the United States, the European Union, and their partners were aligned, targeting the access to Western capital markets for a sub-set of large systemic Russian firms. There was no direct provision targeting currency usage in the 2014 sectoral sanctions. We argue that the key asymmetry susceptible to explain a shift towards euro denomination of Russian claims lies in how the extra-territorial application of U.S. sanctions interacts with the structure of the global USD payment network.

The 2014 sectoral sanctions thus introduced two distinct frictions in cross-border flows to Russia. First, a jurisdiction-specific friction that affects banks under the oversight of a sanctioning jurisdiction and is in principle symmetric across Western jurisdictions. Second, a currency-specific friction, arising from the *extra-territorial* application of U.S. sanctions to any transaction clearing via the dollar payment system. This asymmetry creates higher sanction-compliance costs and, consequently, settlement risk in U.S. dollars relative to other currencies and, in particular, the euro.

2.1 Jurisdiction-specific Frictions

2.1.1 Sectoral Sanctions

The immediate sanction response to Russia's annexation of Crimea in 2014 first involved a set of "individual" restrictive measures targeting politically connected persons and entities. Inclusion on the Specially Designated Nationals (SDN) list entails a prohibition for all U.S. persons to engage in any transaction or provide any funds, goods, or services to the designated party, effectively excluding it from the U.S. financial system, as well as a comprehensive asset freeze[6].

Fishman (2025) describes how, over the course of 2014, parts of the U.S. administration were in favour of adopting such comprehensive blocking measures against Russia's strategic sectors. This would have been in line with the approach taken against Iran, which ultimately paved the way to the 2015 Joint Comprehensive Plan of Action (JCPOA), also known as the "Iran Deal", limiting the country's nuclear programme in exchange for sanctions relief. In the Russian case, however, the U.S. Treasury viewed a wide-scale blocking of large Russian state-owned enterprises as presenting substantial financial stability risks, given their size and level of integration within the global financial system.

Instead, so-called "sectoral", more targeted, financial sanctions were deployed by both the U.S. and the EU in the aftermath of the invasion of Crimea[7]. These measures were deliberately narrower in scope: rather than blocking access to all financial services and freezing assets, they restricted the ability of a sub-set of systemically important Russian firms to access *new* financing

[6]The EU applies substantively equivalent measures through its consolidated list of designated persons and entities subject to asset freezes and prohibitions on making funds or economic resources available.

[7]Trade sectoral sanctions, targeting military and dual-use goods and deepwater, Arctic offshore, and shale oil exploration and production projects.

and therefore to refinance their existing foreign liabilities.

Significant diplomatic efforts took place during the summer of 2014 to reach a EU-U.S. agreement on the implementation of sectoral sanctions against Russia, and to align the two sanctioning regimes in the second half of 2014.

2.1.2 Sanction Alignment in Western Jurisdictions

In the United States, sectoral sanctions were introduced under *Executive Order 13662* of March 20 2014[8]. The first designations, announced on July 16 2014, prohibited U.S. persons from providing new financing - defined as new debt of longer than 90 days' maturity or new equity - to a limited set of large Russian firms in the financial, energy, and defence sectors. These restrictions did not entail any asset freeze or wide-spread blocking of interactions with U.S. persons, and existing obligations could continue to be serviced.

In the European Union, a corresponding framework was adopted following the Foreign Affairs Council decision of July 22 2014[9]. The EU provisions prohibited EU persons from dealing in new transferable securities and money-market instruments beyond specified maturities, and from granting new loans or credit to the targeted entities. The EU's sectoral measures therefore broadly matched, in EU law, the same banking, energy, and defence coverage as the U.S. sectoral sanctions, while likewise stopping short of imposing a full-fledged blocking or asset freezes on these firms.

By the end of 2014, the two regimes were essentially aligned on the same set of firms, as detailed in Table A.1. Only two differences persisted. First, the U.S. were the only jurisdiction to sanction Russian energy producer Novatek[10]. Second, the U.S. designated the Russian defense conglomerate Rostec, while the EU only specifically targeted its three main subsidiaries. Between 2014 and 2021, both regimes continued to target the same set of parent groups[11], with the maximum allowed short term financing maturity progressively brought down from the initial 90 days to 30 days in the EU and between 60 and 14 days, depending on the targeted sector, in the US[12].

The sanctioning coalition was broader than the U.S. and the EU. Financial centres in EEA-countries, including Norway and Iceland aligned themselves on the EU sanctioning regime[13].

[8] Which authorised the Secretary of the Treasury to identify persons operating in specified sectors of the Russian economy and impose targeted financing restrictions through the "Sectoral Sanctions Identifications" (SSI) List. See U.S. Department of the Treasury, Office of Foreign Assets Control, *Executive Order 13662 of March 20 2014*, available at https://www.govinfo.gov/link/cpd/executiveorder/13662, with the end-2014 SSI List ("Changes to the SSI List in 2014") available at https://www.treasury.gov/ofac/downloads/ssi/ssinew14.pdf.

[9] Codified by Council Regulation (EU) No 833/2014 of 31 July 2014 concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine, available at the end-2014 consolidated version at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02014R0833-20141206.

[10] The smallest operating firm under sectoral sanctions, as measured by outstanding principal debt in 2014 in Capital IQ data.

[11] See Welt et al. (2022).

[12] Towards the end of our sample of interest, U.S. authorities broadened financial sanctions restrictions to include the primary market of Russian sovereign debt. A Directive under Executive Order 13883, effective 26 August 2019, prohibited U.S. banks from participating in the primary market for non-ruble-denominated bonds issued by the "Russian sovereign" and from lending non-ruble-denominated funds to it. In 2021, the restrictions was extended to ruble-denominated sovereign assets.

[13] After Brexit, the United Kingdom maintained regulatory continuity by adopting the *Russia (Sanctions) (EU Exit) Regulations 2019* under the *Sanctions and Anti-Money Laundering Act 2018.*

Similar, if not stricter, sanctioning regimes were put in place by Canada[14] and Australia[15] by early 2015. By end-2014, Japan and Switzerland had both aligned politically with EU and U.S. sanctions but implemented — at least *de jure* — narrower, capital-market–focused measures, restricting the issuance of long-term securities by five major Russian banks, with no explicit provision targeting new loans or energy and defence firms[16]. The set of sanctioning jurisdictions is therefore smaller than after the full-scale invasion of Ukraine in 2022, when the sanctioning coalition also included, among larger economies, New Zealand, Singapore, South Korea and Taiwan.

2.1.3 De-Risking and Implications for Lending to Unsanctioned Firms

Formally, these provisions did not prohibit financial institutions from maintaining pre-existing exposures to sanctioned entities or from extending credit to non-sanctioned Russian firms. Indeed, despite an immediate drop in outstanding claims in 2014-2015, a substantial volume of cross-border financing to Russia continued during this period, which is at the core of this paper's empirical questions.

In practice, however, the broad anti-circumvention and ownership-control clauses embedded in both the U.S. and EU frameworks created significant compliance risk for banks. Complex ownership or control structures makes the identification of the ultimate beneficiary of a transaction uncertain, while the very logic of sanctions as a foreign-policy tool implies a risk that currently non-sanctioned counterparties in Russia could later be designated. This uncertainty explains a well-documented global trend in cross-border banking that has been dubbed regulatory "de-risking" (Bank for International Settlements, 2016; FSB, 2018) — the practice by financial institutions of curtailing or terminating relationships with certain clients or jurisdictions perceived as posing heightened compliance or reputational risks, rather than managing such risks through due diligence. Patterns of over-compliance by global financial institutions have been noted in legal analyses of sanction risk management (Verdier, 2023). Comparable mechanisms (e.g. a bank deciding to de-risk across all lending relationships in Russia) are likely to have been at play in our period of interest. As a result, sectoral sanctions likely generated an additional, indirect jurisdiction-specific friction for banks operating under sanctioning authorities, altering their incentive to extend credit to Russian unsanctioned firms beyond the directly prohibited activities. Additionally, de-risking and "voluntary alignment" by banks outside of sanctioning jurisdictions might also not be ruled out, and is ultimately an empirical question.

Proposition 1 *Cross-border lending to Russia should decline more for banks under sanctioning jurisdictions relative to banks from non-sanctioning jurisdictions, across all currencies*

[14] Special Economic Measures (Russia) Regulations SOR/2014-58, available at: https://laws.justice.gc.ca/eng/regulations/sor-2014-58/20150629/P1TT3xt3.html

[15] Under Autonomous Sanctions (Designated Persons and Entities and Declared Persons – Russia and Ukraine), available at https://www.dfat.gov.au/international-relations/security/sanctions/sanctions-regimes/russia-sanctions-framework.

[16] For Switzerland, see Swiss Federal Council, "Situation in Ukraine: Federal Council decides on further measures," 27 August 2014, https://www.news.admin.ch/en/nsb?id=54221. For Japan, see Ministry of Foreign Affairs of Japan, "Prohibitive Measure of Issue of Securities by Designated Russian Federation Banks and Their Subsidiaries," 24 September 2014, https://www.mofa.go.jp/fp/nsp/page4e_000263.html.

of denomination. This follows from the symmetric EU-U.S. sectoral financial sanctions introduced in 2014, which restricted new financing to a defined set of Russian firms and heightened compliance risks for transactions with any Russian counterparty and in any currency, thereby increasing the cost of providing credit for banks subject to these regimes.

2.2 Currency-specific Frictions

2.2.1 Dollar Settlement Risk under U.S. Extraterritoriality

Why then does a sanctioning regime, that is essentially symmetric across jurisdictions, generate asymmetric effects across currencies? We argue that a key explanation lies in EU-U.S. asymmetries in their approach to extra-territoriality and oversight of payment infrastructures. The interaction between U.S. extra-territorial jurisdiction and the structure of global payments networks gives rise to *currency-specific frictions*, namely a form of *dollar-settlement risk* that does not arise in the euro system, which defines its jurisdiction more narrowly.

Under regulations of the Office of Foreign Assets Control (OFAC), the sanction-enforcement arm of the U.S. Treasury, any "U.S. person" is subject to U.S. sanctions[17]. Moreover, OFAC consistently interprets its jurisdiction to extend to any transaction with a so-called "U.S. nexus", i.e. any connection that brings a foreign transaction within U.S. jurisdiction. A U.S. nexus arises when a U.S. person is involved directly, when U.S.-origin goods or services are used, or - in the case of financial flows - when a transaction is cleared or otherwise passes through the U.S. financial system.[18]

As noted by Cipriani et al. (2023), the vast majority of global U.S. dollar transactions are routed through New York, where settlement occurs on the *Fedwire Funds Service* or on *CHIPS*. Because only U.S.-regulated banks can participate directly in these systems, foreign banks must access them through correspondent accounts at U.S. institutions; as a result, nearly all cross-border dollar payments create a *U.S. nexus* and fall under U.S. jurisdiction. In a typical transaction, a foreign borrower or lender instructs its domestic bank to transfer funds in dollars, which are routed through the bank's U.S. correspondent for final settlement on Fedwire or CHIPS, subjecting the payment to OFAC compliance screening[19]. Given the U.S. nexus embedded in any global USD payment transaction we should therefore expect sanctioned entities to be effectively cut off from the U.S. dollar circuit.

A natural question is whether such mechanisms might also affect transactions involving unsanctioned firms in at-risk jurisdictions, i.e. whether compliance de-risking disproportionately constrains transactions in U.S. dollars. Direct evidence of this is provided by the public consultation carried out by the BIS Committee on Payments and Market Infrastructures, which

[17] A *"United States person"* comprises (i) any U.S. citizen or permanent resident wherever located, (ii) any entity organized under U.S. law, including its foreign branches, and (iii) any person physically present in the United States. See International Emergency Economic Powers Act (50 U.S.C. §§ 1701–1706); OFAC, "Who must comply with OFAC regulations?" FAQ 11.

[18] In such cases, the non-U.S. party is deemed to have "caused" a U.S. person, typically a correspondent bank in the United States, to process a payment subject to OFAC rules. See OFAC, *A Framework for OFAC Compliance Commitments* (2019); OFAC FAQ 16 ("When does a transaction have a U.S. nexus?"); and OFAC Enforcement Release: *Standard Chartered Bank* (Apr. 9, 2019).

[19] Payment instructions are transmitted via SWIFT, which provides standardized messaging but not settlement; the jurisdictional link arises in the settlement leg through the U.S. correspondent.

reports that correspondent banks have become increasingly reluctant to provide services in currencies perceived as carrying high sanction compliance risk, i.e. the U.S dollar[20](Bank for International Settlements, 2016). Faced with uncertainty, U.S. correspondents operating under OFAC's "strict liability" regime[21] are indeed likely to adopt conservative compliance practices. They may delay or refuse transactions involving jurisdictions or sectors viewed as carrying elevated OFAC risk, particularly when ownership structures are opaque.

Consider, for example, a dollar-denominated loan from a Chinese bank to a Russian firm that is not itself sanctioned. Such an arrangement involves recurring cash flows — interest and principal payments — that must pass through a U.S. correspondent bank. Even if both parties remain fully compliant, the settlement of these payments depends on the correspondent's evolving assessment of compliance risk. Should perceived exposure rise or risk tolerance narrow, payments may be prevented to settle, despite the liquidity and willingness to pay of the borrower. This constitutes a sanctions-compliance-driven form of settlement risk in U.S. dollars - a *currency-specific friction*. We now turn to how this friction might not be at play in the euro-system's jurisdictional approach.

2.2.2 EU Opposition to Extra-territorial Jurisdiction

Why does a centralised euro payment system not give the EU an extraterritorial reach comparable to that of the U.S.? The answer lies in the EU's longstanding opposition to the extraterritorial use of sanctions, shaped by its opposition to U.S. sanctions binding EU firms in foreign markets. The 1996 "Blocking Statute,"[22] adopted in response to U.S. measures on Cuba, Iran, and Libya, prohibits EU operators from complying with certain third-country laws with extraterritorial effect, although its actual effectiveness in doing so has been questioned. Consistent with this stance, the definition of "EU persons" encompasses only EU nationals, entities incorporated under Member-State law, and any person or activity located within EU territory. In the case of the U.S. Russia sectoral sanctions adopted in 2014, the scope of "U.S. persons" was aligned with this definition. However, the broader U.S. sanctions framework has historically adopted a wider conception of jurisdiction: in several regimes—most notably those concerning Iran and Cuba—U.S. prohibitions extend to foreign entities owned or controlled by U.S. persons. By contrast, EU sanctions have not explicitly bound foreign subsidiaries of EU companies.[23]

More importantly, euro payments do not create an automatic "EU nexus" analogous to the U.S. nexus in dollar transactions, i.e. non-EU counterparties are not brought under EU

[20]The report highlights how de-risking of correspondent bank relationships has been particularly pronounced in the U.S. dollar, where correspondent activities have become increasingly concentrated in U.S. banks while non-U.S. banks have withdrawn from offering dollar services except for limited ancillary functions.

[21]See U.S. Department of the Treasury, Office of Foreign Assets Control, *Economic Sanctions Enforcement Guidelines*, 31 C.F.R. Part 501, Appendix A: "OFAC may impose civil penalties on a strict liability basis," https://ofac.treasury.gov/faqs/topic/1626.

[22]Council Regulation (EC) No 2271/96 (OJ L 309, 29.11.1996); European Commission, "Blocking Statute: Protecting EU Operators from the Extraterritorial Application of Third-Country Laws," 2022.

[23]Council Regulation (EU) No 833/2014, Arts 12–13. Foreign branches of EU entities, lacking separate legal personality, are generally covered, whereas subsidiaries incorporated under non-EU law are not, unless the EU parent knowingly participates in their activities. This interpretation prevailed during 2014–2021, though recent guidance hints at a gradual shift toward a stricter, control-based approach.

jurisdiction merely by using the currency[24]. Indeed, EU opposition to extra-territoriality of sanctions jurisdiction was strongly reaffirmed over 2014-2021. The 2017 Countering America's Adversaries Through Sanctions Act (CAATSA), which potentially provided the basis for a broader application of secondary sanctions targeting EU companies involved in gas pipelines projects in Russia[25], prompted a strong political reaction by EU leaders[26]. Opposition to extra-territoriality was further reaffirmed following the withdrawal of the U.S. from the Iran's Joint Comprehensive Plan of Action and the reinstatement of U.S. sanctions against Iran on May 8, 2018. On June 6, 2018 the European Commission issued an update to its Blocking Statute, extending its application to the re-imposed extra-territorial U.S. sanctions against Iran.

Furthermore, it is to be noted that enforcement of sanction regulations in the EU entirely relies on national authorities, rather than a centralised, specialised enforcement arm such as the U.S. OFAC.

2.2.3 Perceptions of U.S. Dollar Settlement Risk by Market Participants in 2014

Issues around foreign currency settlement risk for Russian sanctioned entities became topical following the full-scale blocking sanctions against Russia in 2022 (Bradley et al., 2022; Breydo, 2022), among a technical default of some Russian sovereign bonds and substantial delays in coupon payments on Gazprom's Eurobonds, both caused by Western blocking measures. However, there is ample evidence that market participants were fully aware of U.S dollar settlement risk in jurisdictions with high sanction compliance risk as soon as 2014.

In June 2014, the U.S. Department of Justice and OFAC imposed nearly $9 billion in penalties on BNP Paribas for processing U.S.-dollar transactions through the U.S. financial system on behalf of clients in Sudan, Iran, and Cuba, in violation of U.S. sanctions.[27] The case, which included a one-year suspension from direct dollar clearing,[28] brought the compliance obligations of USD correspondent banks — and their exposure to U.S. sanctions enforcement — to the forefront of market participants' attention.

Following the 2014 sectoral financial sanctions on major Russian banks and energy companies — large and frequent participants in global capital markets — the issue of dollar-settlement risk for unsanctioned Russian entities came sharply into focus. In early 2015, London-based lawyers at Clifford Chance observed that sanctions clauses had become central to Russian loan documentation and that "currency-toggle" provisions were increasingly incorporated into cross-border loan contracts involving Russian borrowers (Fadian, 2015). These clauses, while keeping

[24]See European Commission, *Guidance Note on the Implementation of Council Regulation (EU) No 833/2014* (2022), Section 1, and European External Action Service (EEAS), "EU Sanctions: How and When They Are Applied".

[25]See Fried and O'Toole (2017).

[26]The German foreign minister and the Austrian chancellor jointly declared *"We cannot accept the threat of illegal extraterritorial sanctions against European companies"*, *Berlin hits back at U.S. move to tighten sanctions on Russia*, Financial Times, June 15, 2017.

[27]U.S. Department of Justice, *"BNP Paribas Agrees to Plead Guilty and to Pay $8.9 Billion for Illegally Processing Financial Transactions for Countries Subject to U.S. Economic Sanctions,"* June 30, 2014, https://www.justice.gov/archives/opa/pr/bnp-paribas-agrees-plead-guilty-and-pay-89-billion-illegally-processing-financial.

[28]Office of the Governor of New York, *"Cuomo Administration Announces BNP Paribas to Pay $8.9 Billion, Including $2.24 Billion to DFS, Terminate Senior Executives, Restrict U.S. Dollar Clearing Operations for Violations of Law,"* June 30, 2014, https://www.governor.ny.gov/news/cuomo-administration-announces-bnp-paribas-pay-89-billion-including-224-billion-dfs-terminate.

contracts denominated in dollars, permitted payment in an alternative currency in case the borrower was prevented access to dollar clearing.

A similar pattern materialised in the Russian Eurobond market when large non-sanctioned Russian entities resumed primary market issuance for the first time after the invasion of Crimea, in the Spring of 2016. Strikingly, Russia's 2026 USD Eurobond issued in 2016 included an "Alternative Payment Currency Event Clause" allowing repayment in euros, pounds sterling, or Swiss francs if dollar payments became impossible for reasons beyond the issuer's control. In the run up to the 2022 full-scale invasion of Ukraine, similar clauses later appeared in corporate bond issues by Gazprom, even allowing repayment in rubles.

These contractual innovations illustrate how concerns over U.S.-dollar settlement risk became embedded in Russian cross-border financing after 2014. From the point of view of both lenders and borrowers, an obvious alternative to such complex and, arguably, "exotic" contractual clauses would have been an outright shift in the currency of denomination of loans. Given its rank as the second most widely used international currency, strong trade links between Russia and the EU and the absence of extra-territorial application of EU law, the euro represented the best alternative to the U.S. dollar in this regard.

Proposition 2 *Following the 2014 sanctions, non-USD denomination of global banking claims on Russia should increase relative to USD denomination, for all jurisdictions, regardless of whether they imposed sanctions on Russia.* This follows from the extra-territorial enforcement of U.S. sanctions, which embeds legal jurisdiction in the dollar payment system and exposes all dollar transactions to compliance risk. Euro-denominated payments do not entail a comparable exposure, given a more fragmented enforcement apparatus and traditional EU opposition to extra-territorial jurisdiction. This asymmetry generates higher settlement risk in U.S. dollars relative to euros, driven by higher compliance costs for U.S dollar correspondent banks handling Russian-related settlements, particularly in borrowing jurisdictions with high sanction compliance risk.

3 Data

In this section we describe the different data sources employed in our analysis on the effects of sanction risk on cross-border credit allocation and vehicle currency usage. We start by presenting the dataset on corporate liabilities by currency, and the one on UK-based global banks' cross-border positions. Then we describe our dataset on global syndicated loans and, finally, the Locational Banking Statistics from the BIS.

Capital IQ We source firm-level outstanding liabilities by currency and debt instrument from S&P Capital IQ. The dataset includes active and inactive public and private ultimate-parent companies filing financial statements. This information is available mostly at annual rather than quarterly frequency. Liabilities are grouped into Bonds and Notes, Term Loans, Capital Leases and Other Borrowing. We use this data to calculate the stocks and shares of principal due by Russian firms by currency of denomination, which we use to understand the shift in Russian companies' debt structure, depending on whether they are subject to the 2014 sectoral sanctions, in Section B.

We perform a series of cleaning steps in line with the literature (Adams & Verdelhan, 2022; Alfaro et al., 2025; Boyarchenko & Elias, 2024; Rodnyansky et al., 2022), and some novel ones specific to our analysis of the effects of financial sanctions. First, we keep observations corresponding to the latest filing for each fiscal year starting in 2001, when the debt structure data becomes more comprehensive. Second, following Lou and Otto (2020), we drop items corresponding to a "facility", as this indicates total *available* credit rather than withdrawn. Third, we aggregate our dataset from instrument to the company-currency-year level.[29] Fourth, we manually check our sample of Russian firms from CIQ against the list of sectoral sanctions issued by the US and the EU (Table A.1) to identify the sanctioned firms sample. In line with the literature using CIQ data, we focus on ultimate parents ("operating" firms) , to avoid any double counting due to the consolidated nature of CIQ data. Another reason is that the detailed capital structure data for non-operating firms (subsidiaries) are less granular and suffer from some reporting gaps. [30].

Finally, we augment the dataset with additional balance sheet information sourced from Capital IQ itself. These include total assets, total liabilities, total equity, revenues, EBITDA, operating income, interest expenses, currency of statements, SIC sector, country of incorporation, immediate and ultimate owner.

UK Resident Banks Global Claims by Currency The Bank of England's confidential quarterly panel of bank unconsolidated balance-sheet data includes information on banks'

[29]This also helps with circumventing the issue that identifiers of each debt instrument in CIQ might change over time, so it is difficult to keep track of the same component of liabilities across time.

[30]This means our core sanctioned sample does not include Gazprom Neft, a subsidiary of Gazprom Group, itself not subject to sectoral financial sanctions, and Rostec, a state owned defence conglomerate which does not file financial statements. We still collect available data on the detailed capital structure of Gazprom Neft and all of Rostec subsidiaries reported in CIQ. Given the smaller size of these firms compared to the rest of the sanctioned sample and the fact that they behave very similarly in terms of the evolution of their debt profile, their exclusion is unlikely to alter our baseline results. We show in the Appendix in Figure B.3 the profile of total debt by currency for those firms, as reported in CIQ

cross-border claims[31] and liabilities[32] on non-residents. The dataset collects submissions from domestic and foreign-owned banks operating in the UK through regulatory filings and statistical data forms. We leverage this dataset to create a panel of banks' positions towards non-residents by asset, country, and currency over the post-GFC sample 2010 to 2023.

This source of cross-border banking data has been used by other studies on a variety of topics.[33] With respect to other financial centres, UK-resident banks dominate global cross-border banking, with their claims nearly twice as large as those of US-based banks on average (Bippus et al., 2024). The dataset is therefore typically considered as a representative sample of global banking flows. As shown in Figure A.1, which depicts total cross-border credit flows to Russia as reported to the BIS by residency, cross-border credit to Russia extended by UK-resident banks account for a sizeable share of total cross-border lending to Russia (around 30%, before 2014), although this share declined after 2014 with the rise of claims reported from residual "other" jurisdictions.

In our analysis we consider only cross-border lending in the form of loans and advances.[34] We also maintain the country dimension of the panel in order to be able to compare flows to specific economies, in particular Russia, against others. This leaves us with a sample spanning from 2010 Q1 to 2023 Q4, and including 285 banks, 231 countries[35] and 6 currency groupings (GBP, USD, EUR, JPY, CHF and a residual group labeled others "OTH"), for a total of 31,992 unique bank-country-currency combinations.

At aggregate level our sample is dominated by established "continuers" banks: around 80% of the aggregate loans and advances position in every quarter is accounted for by banks which report every quarter in our sample. A smaller proportion of banks enter and exit the dataset over our sample, but we cannot easily distinguish these dynamics from bankruptcy or new establishments because of the reporting thresholds applied to the reporting forms.

Although we focus on claims, we provide some information on the dynamics of cross-border liabilities, specifically cross-border deposits.[36] Following the same cleaning process as for the claims' dataset, our selected sample going from 2010 Q1 to 2023 Q4 includes 271 banks, 231 countries, for a total of 40,331 unique bank-country-currency combinations (with the same 6 currency groupings as above).

Syndicated Loans We source information on global syndicated loans from Refinitiv Loan-Connector DealScan over a sample going from 2010 to 2019. In a syndicated loan transaction, a borrower takes out a "deal" from a group, a "syndicate", of lenders. This deal includes several loans, called "tranches". This is the relevant level for currency denomination. The dataset in-

[31] `https://www.bankofengland.co.uk/statistics/data-collection/statistical-reporting/form-cc`.

[32] `https://www.bankofengland.co.uk/statistics/data-collection/statistical-reporting/form-cl`.

[33] Including Aiyar et al. (2014), Andreeva et al. (2023), Bippus et al. (2024), Bussière et al. (2021), Eguren-Martin et al. (2024), Forbes et al. (2017), and Lloyd et al. (2023).

[34] Specifically, we consider the flows labelled "loans and advances, and claims under sale and repurchase agreements", and add up the sectors "non-resident deposit taking corporations (incl. CMIs)" and "other non-residents".

[35] We dropped observations where countries of non-resident counterparties were not disclosed. We did so as we could not identify them, and to be sure to exclude observations from potentially sanctioned countries from our analysis.

[36] We consider the flows labelled "sight and time deposit liabilities and liabilities under sale and repurchase agreements", and add up the sectors "non-resident deposit taking corporations (incl. CMIs)" and "other non-residents", as done for claims.

cludes quantitative and qualitative info at the lender-borrower-loan level: we observe borrower and lender identifiers, loan type, purpose, maturity, interest rate and spreads over benchmark rates, currency, and lending amount.

Syndicated loans are economically relevant and representative of global capital flows. Total cross-border syndicated lending to non-financial firms represents around three-quarters of the total volume of cross-border bank lending to non-financial borrowers (Doerr & Schaz, 2021). Syndicated loans comprised 30% of total global cross-border debt in 2012 Q4, and 46% for emerging markets (Elliott et al., 2024).

We focus on *origination*, and exclude any subsequent amendment to the same loan. In line with the literature, we perform pro-rata splits whenever exact loan shares by lenders are not available — this has been shown to be a reasonable approximation to the actual split (Aldasoro et al., 2022; Doerr & Schaz, 2021). To measure the size of tranches, we rely on the U.S. dollar tranche value provided by Dealscan and convert it to 2015 U.S. dollars. We are however particularly interested in prices of syndicated loans, as this is the key advantage of the DealScan data compared to the banking claims data we rely on in the rest of the paper. Although prices are typically not available for most deals in DealScan, the available coverage is sufficient for us to analyse a large enough sample of loan prices in Section 6. To this effect, we fill some gaps in DealScan pricing information for Russian firms by manually inputting the currency, maturity, prices and benchmark rate of syndicated loans for which this information is missing in DealScan and we were able to collect it from the financial statements of Russian companies[37].

Our final sample contains 80,233 loans (tranches), 32,014 borrowers, 7,082 lenders, 140 lenders' and 173 borrowers' countries over the period 2010-2019. Finally, we group countries in Advanced Economics and Emerging Markets following the IMF classification.[38] Following De Haas et al. (2025), we aggregate our syndicated loan dataset at the bank-borrower-currency-year level. This means that in the empirical analysis in Section 6 our variables of interests are the total volume lent and the volume-weighted average spread at the bank-borrower-currency-year level.

Locational Banking Statistics The Bank for International Settlements' (BIS) Locational Banking Statistics (LBS) provides the key stylised fact that motivates this paper, by looking at the evolution of the currency breakdown of global claims on Russia. Furthermore, we use it as a complementary data source to link our empirical findings in firm, bank and loan-level data to aggregate patterns and the literature on geoeconomic power. The LBS provide quarterly data on the outstanding positions of internationally active banks disaggregated by reporting *and* counterparty country, sector, and currency of denomination. Crucially for our analysis, the BIS data allows us to identify lenders' countries both on a residence and nationality basis. To quantify the evolution of U.S. geoeconomic power in Russia we mainly focus on the nationality basis 7.[39]

[37]This chiefly concerns Gazprom Group, for which we were able to retrieve missing informations on pricing, maturity and currency of denomination of existing Dealscan deals for 13 deals after 2014, relying on Gazprom's own IFRS financial filings retrieved in Capital IQ.

[38]See Table A. Economy Groupings in Fiscal Monitor, Oct 22.

[39]From the nationality-basis dataset we drop consortium banks, non-reporting developing Africa and Middle East, non-reporting developing Asia and Pacific, non-reporting developing Europe, non-reporting developing

Notice how we must employ the restricted version of the public dataset for our analysis of the evolution of geoeconomic power in the final section 7. This is because the public version of the LBS does not report jointly currency splits *and* country breakdowns, no matter whether we are considering a residence or nationality basis.

Our final dataset on a nationality basis includes 39 countries reporting claims on Russia across 6 currency groupings, i.e. USD, EUR, CHF, GBP, JPY, and a residual category. Furthermore, our equivalent sample on a residence-basis includes 44 countries reporting claims on Russia aggregated across the same currency groupings.

Latin America and Caribbean, all-countries totals, unallocated locations, and non-reporting developed countries. From the residence-based dataset we drop currency and country aggregates, as well as unallocated currency entries.

4 The Effect of the 2014 Financial "Sectoral" Sanctions on Russian Firms' Balance Sheets

This section provides some stylised facts as well as estimates on the impact of the 2014 financial sanctions on the capital structure of targeted and non-targeted Russian firms. Relying on Capital IQ data, we are able to analyse the balance sheets and the currency composition of the liabilities of all Russian firms under sectoral sanctions, as well as a large sample of non-sanctioned Russian firms and emerging markets firms active in global capital markets. Compared to the rest of the paper, we therefore implicitly broaden our analysis to marketable debt and other non-bank financing, which we do not observe in the rest of the paper. Similarly, the data we observe in this section also include lending to Russian firms by domestic lenders, in domestic and foreign-currency.

The key purpose of this section is to clarify our findings in the more granular banking and loan data we analyse below, and to rule out that euro lending flowed to *sanctioned* Russian firms, i.e. that euro-isation had anything to do with sanction avoidance practices.

We show that overall debt levels and dollar denominated principal declined across all Russian firms, regardless of their sanctioning status. However, only firms that were not under sanctions managed to increase their euro denominated debt, ruling out any role of sanction avoidance in the increase of euro-denominated flows to Russia. Sanctioned firms also experienced a substantial increase in interest payments and debt-burden levels compared to non-sanctioned firms.

4.1 Stylised Facts on Russian Firms after the 2014 Sectoral Sanctions

We concentrate our analysis on operating firms, i.e. parent companies. This is economically sensible as sanctions on a subsidiary that do not simultaneously target the parent are likely to induce intra-group reallocation of claims[40]. The relevant object to study debt structure shift is indeed the consolidated statements at the parent level[41] The aggregate figures for sanctioned firms in the Panels of Figure 2 therefore comprise all but two of the firms under Western sectoral sanctions, as listed in Table A.1.[42]

We define a comparable sample of non-sanctioned Russian firms in the following way. First, we exclude any firm that did not have at least 1bn USD of U.S dollar denominated principal in 2013 from our universe. This is in line with the dollar indebtedness of the smallest firms under sectoral sanctions[43]. Second, we manually check on opensanctions.org that no Russian firm in

[40]This concerns Gazprom Neft in our sample, as Gazprom Group is not itself sanctioned by the U.S. and the EU, and remain one of the larger borrower in international markets.

[41]This bring us to exclude Rostec from the analysis, a government-owned defense conglomerate which does not publish consolidated financial accounts.

[42]Consolidated data for the Rostec group is not available in Capital IQ. Rostec is a defense conglomerate that does not publish financial accounts, although some of its subsidiaries do. As mentioned above, Gazprom Neft is a subsidiary of Gazprom Group, which is itself not subject to financial sectoral sanctions. Although we exclude Rostec's subsidiaries and Gazprom Neft from the evidence presented in this section, equivalent charts looking at their debt profile and currency composition can be seen Figure B.3, although data has some gaps in continuous coverage. As they are by far the smallest firms under sectoral sanctions and the trends presented in Figure B.3 are all but similar to the ones of sanctioned operating firms, this exclusion is unlikely to change our key firm-level results.

[43]Both United Aircraft Corporation and Gazprom Neft had between 3 and 4bn of USD denominated debt in

the non-sanctioned sample was subject to sanctioning measures other than sectoral sanctions during 2014-2021.[44]

Figure 2 provides a first striking stylised fact. The overall debt level of sanctioned firms declined significantly more after 2014 than for non-sanctioned firms.[45] Sanctioned firms also saw a more marked decline in their leverage ratio and a striking increase of their debt burden compared to non-sanctioned firms. This suggested that sanctions achieved their intended effect and tightened financial conditions more for firms designated in the sectoral sanctions list.

A second key stylised fact is depicted in Panels (c) and (d) of Figure 2. Both sanctioned and non-sanctioned firms de-dollarised their balance sheet, reducing their principal due denominated in U.S. dollar both in absolute levels and as a share of total debt. However, only firms that were not designated under sectoral sanctions increased their euro-denominated debt. The substitution of dollar with euro liabilities for non-sanctioned firms only is consistent with the relative increase in dollar settlement risk that underlies our Proposition 2 above. The fact that sanctioned firms were not able to increase their euro liabilities also rule out the hypothesis that banks relied on euro flows as part of sanction avoidance strategies.

4.2 The Effect of the 2014 Sectoral Sanctions on Debt Levels and Currency Denomination

We now provide some further quantification on the effect of the 2014 sectoral sanctions on the capital structure and currency composition of debt for both sanctioned and non-sanctioned firms. We expand our sample to a non-Russia control group of firms with at least 1bn USD of U.S. denominated debt in 2013. In our preferred specification, we further restrict the control group to only emerging markets comparable to Russia in terms of size, geopolitical alignment and relative levels of economic integration with the EU.[46] We look at a sample from 2010 to 2020.[47]

We then estimate the following Difference-in-Difference ("DiD") regression

$$Y_{it} = \beta_1 \cdot \text{Post}_t \times \text{Russia}_i + \beta_2 \cdot \text{Post}_t \times \text{Russia}_i \times \text{Sanctioned}_i + k + \varphi_i + \varphi_{st} + \varepsilon_{it} \quad (1)$$

where Y_{it} is a variable of interest varying across firms and time, $Post_t$ is a dummy variable equal to one from 2014 onward, $Russia_i$ is a dummy variable equal to one if the firm operates from Russia and $Sanctioned_i$ is a dummy variable equal to one if the firm is a sectoral-sanction designated firm. We include firm and sector-time fixed-effects in all specifications. The latter help us absorb endogenous difference across sectors in debt levels and their currency composition, including aggregate sectoral trends and shocks.

Table 1 and 2 provide results from Equation 1 on selected measures of leverage and debt

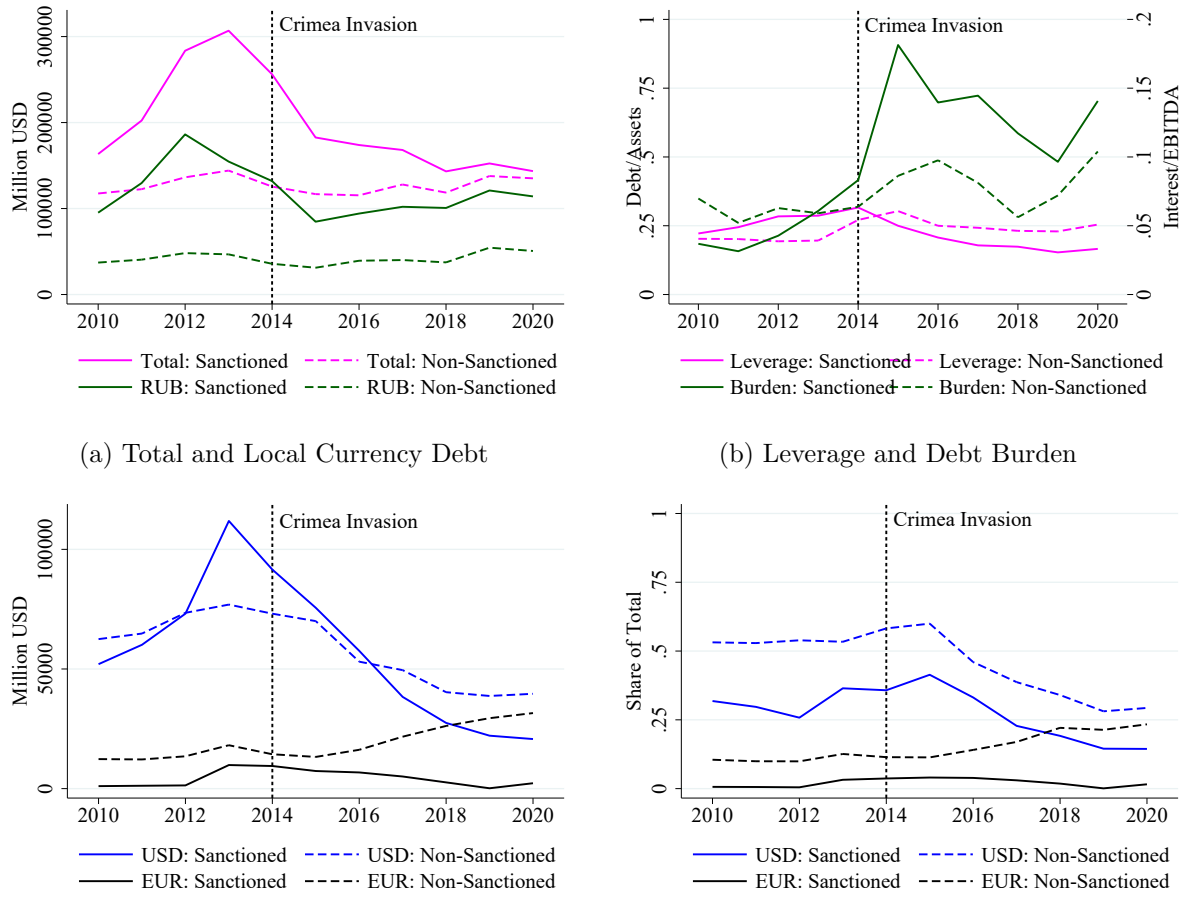
2013.

[44] This yields a sample of between 15 and 17 non-sanctioned Russian firms in 2010-2020.

[45] Although this was driven by rising local currency liabilities in the financial sector firms prior to 2014, these sectoral heterogeneity is addressed in the empirical section below.

[46] BRICS+ and CEEMEA countries.

[47] The post-2022 period is outside of the scope of this paper as the sanctioning regime substantially tightens along many dimensions. We also exclude 2009 as it coincides with the Global Financial Crisis. Additionally, gaps in data availability for some of the large Russian firms of interest appear in Capital IQ after 2020, limiting our analysis to 2010-2020.



(a) Total and Local Currency Debt

(b) Leverage and Debt Burden

(c) USD and EUR Principal Due

(d) Share of Principal Due in USD and EUR

Figure 2: Debt Profile and Currency Composition of Russian Firms by Sanctioning Status.

Note. – Operating companies only. Sanctioned firms cover the full universe of operating firms under sectoral sanctions except for Rostec. Non-sanctioned firms cover the sample of Russian firms with at least 1bn USD-denominated debt in 2013.

Source: Capital IQ, authors' calculations.

burden. The results suggest that, within-firm, and once-controlling for sectoral trends, the 2014 sectoral sanctions led to a symmetric decline in overall debt levels for sanctioned and non-sanctioned Russian firms, by about -30% compared to the emerging markets control group. They also confirm that only sanctioned firms were forced to deleverage compared to the control group, as they experienced a four-fold increase in interest expenses and a substantial increase in debt burden.[48]

Table B.2 and B.6 then turn to results from Equation 1 looking at the currency composition of debt. Regressions of debt levels by currency are estimated with PPML on a panel that includes "zero" observations, so as to account for both the intensive and extensive margin, particularly in euro-denominated debt. It confirms that all Russian firms in our sample reduced their dollar denominated debt, by 45% compared to the control group, regardless of whether they were designated in the sectoral sanctions list, as shown by the insignificant estimate on

[48]Notice that the coefficients from the tables need to be exponentiated to derive the exact percentage change in the dependent variable of interest.

Table 1: Firm-Level Debt and Leverage

	Total Debt			Leverage		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	−0.363***	−0.289***	−0.321***	−0.042***	0.074	0.066
	(0.098)	(0.085)	(0.085)	(0.010)	(0.053)	(0.052)
Post × Russia × Sanctioned			−0.013			−0.084*
			(0.084)			(0.044)
Estimator	OLS	OLS	OLS	OLS	OLS	OLS
Observations	937	1,049	1,128	937	1,049	1,128
R-squared	0.906	0.898	0.902	0.841	0.821	0.822

Estimating sample includes firms in Russia, BRICS+ and CEEMEA emerging markets with more than 1bn USD denominated debt in 2013. Firm and sector-time fixed effects are included in all specifications. Standard errors are clustered by country. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 2: Interest Expenses and Debt Burden

	Interest Expenses			Debt Burden		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	1.417***	−0.149	−0.150	1.488***	0.052	0.074
	(0.290)	(0.158)	(0.163)	(0.217)	(0.134)	(0.135)
Post × Russia × Sanctioned			1.452***			1.298***
			(0.078)			(0.123)
Estimator	OLS	OLS	OLS	OLS	OLS	OLS
Observations	529	677	701	491	641	665
R-squared	0.862	0.858	0.863	0.839	0.844	0.847

Estimating sample includes firms in Russia, BRICS+ and CEEMEA emerging markets with more than 1bn USD denominated debt in 2013. Firm and sector-time fixed effects are included in all specifications. Standard errors are clustered by country. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

the triple interaction term in the USD Debt - DiD column of Table B.2. Similarly, all Russian firms reduced their debt in domestic currency, i.e. the Ruble, but sanctioned firms almost twice as much as non-sanctioned. Euro-denominated debt levels, on the other hand, increased significantly only for non-sanctioned firms and by 110%, while the increase for sanctioned companies is insignificant, as shown by the corresponding "Sanct. total" row under the EUR Debt - DiD column.

Finally, following the approach by Lewis and Xie (2025), we bring together these separate regressions into a single one with USD as base currency. This means that we can run the following regression:

$$\begin{aligned} Y_{ict} = \beta_1 \cdot \text{Post}_t \times \text{Russia}_i \times \text{EUR}_c + \beta_2 \cdot \text{Post}_t \times \text{Russia}_i \times \text{Sanctioned}_i \times \text{EUR}_c \\ + \beta_3 \cdot \text{Post}_t \times \text{Russia}_i \times \text{Dom}_c + \beta_4 \cdot \text{Post}_t \times \text{Russia}_i \times \text{Sanctioned}_i \times \text{Dom}_c \\ + k + \varphi_{it} + \varphi_{ct} + \varphi_{ic} + \varepsilon_{ict} \end{aligned} \quad (2)$$

which allows for the introduction of tighter firm-year, currency-year and firm-currency fixed effects. Consistently with the disaggregated results, we find that all Russian firms have significantly substituted USD debt for liabilities denominated in EUR and domestic currency.

We provide some robustness tests and extensions in Appendix B. Tables B.3, B.4 and B.5 provide similar results including in the control group all firms with at least 1bn USD of U.S. dollar denominated debt in 2013, without selecting for Russia-comparable emerging markets. Our findings are broadly confirmed.[49] Table B.6 reports equivalent results for currency shares as in Table B.2, and B.4 a robustness test expanding again the sample.[50]

There are three key take-aways from our firm-level analysis. First, the 2014 sectoral sanctions managed to inflict targeted damage on sanctioned firms, which disproportionally experienced an increase in interest payments and a deterioration of their debt burden.

Second, our results are consistent with regulatory de-risking by foreign lenders playing an important role in post-2014 Russia cross-border capital flows, as overall debt declined substantially across all Russian firms in our sample, regardless of their sanctioning status.

Third, the firm-level currency patterns we uncover are consistent with higher relative settlement risk in U.S. dollar relative to other currencies and, particularly, the euro. Non-sanctioned firms partially substituted dollar-denominated debt with euro-denominated debt. We find no indication that sanctioned firms were able to raise euro debt in any meaningful way after 2014, suggesting that the management of sanction compliance risk, as opposed to sanction avoidance practices, was the driver of the euro-isation of Russian cross-border flows.

[49] We note that the increase in EUR debt across firms is positive but insignificant, highlighting the importance of selecting a suitable control group for Russia to tease out the sanction-driven rise in EUR denomination of debt.

[50] Note that the observations for the EUR share OLS regressions are larger than those for the EUR debt PPML regression. This is because some zeros are perfectly predicted by the fixed effects and, as under PPML those are removed, some observations might become separated under the high-dimensional fixed effects. OLS does not incur in this "separation" problem.

5 Jurisdiction and Currency Frictions in Bank-Level Lending to Russia after 2014

In this section we directly test the propositions set forward in Section 2, namely the fact that sanction-compliance risk is likely to introduce both jurisdiction and currency-specific de-risking in international capital flows. We rely on bank-level confidential data on global claims of UK resident banks by currency and counterparty country collected by the Bank of England. We begin by showing that the global aggregate stylised fact we uncover in the BIS locational banking data is also present in our confidential bank-level panel focusing on the universe of UK resident banks (Section 5.1). We then show the relevance of both the jurisdiction and currency margins in explaining aggregate patterns in cross-border lending to Russia from the City of London, by providing a detailed de-composition by jurisdiction and currency (Section 5.2). Finally, we empirically test Propositions 1 and 2, and disentangle the relevance of jurisdiction and currency frictions within-banks. We start by testing these propositions on claims on Russia by UK resident banks after 2014. We furthermore test whether banks i) exposed to claims on Russia immediately before the invasion of Crimea, ii) to a sanctioning coalition jurisdiction, or iii) both, changed their lending patterns to other emerging-markets following the 2014 sectoral sanctions on Russia along similar dimensions (Section 5.3).

5.1 Stylised Facts

We begin by showing that lending to Russia from UK-resident global banks broadly followed the aggregate patterns shown in Figure 1 over our period of interest, looking at aggregated confidential data from the Bank of England. As shown in panel (a) in Figure 3, lending to Russia from UK-resident global banks dropped starkly after 2014 both in absolute terms, going from around 25 to 7bn GBP (Figure C.5), and as a share of overall lending to non-UK residents. Panel (b) shows that this decline coincided with a sharp reduction in the number of banks extending loans and advances to Russia.

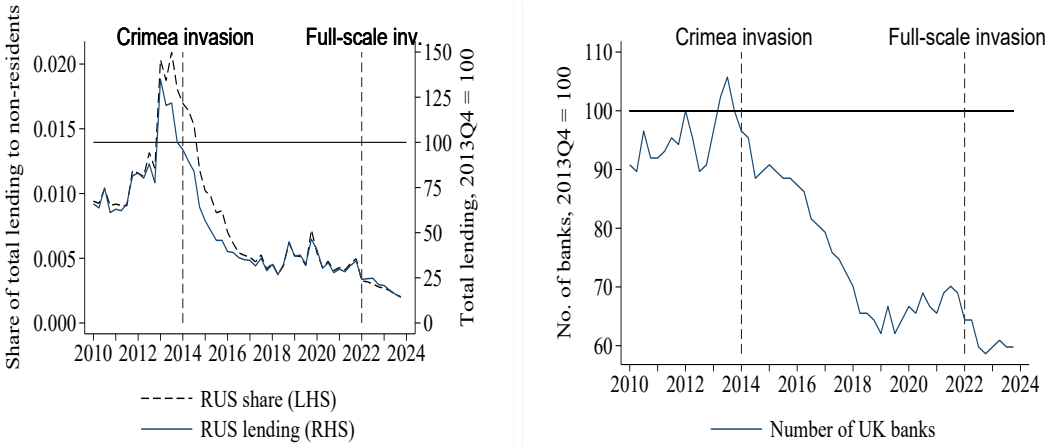
Similarly to the global aggregates in the BIS Locational Data, the 2014 invasion of Crimea coincides with a dramatic shift in the currency composition of international lending. Panel (a) and (b) in Figure 4 compare the currency composition of banks' claims on Russia to those on the Rest of the World (RoW)[51] Lending to Russia underwent a stark *de-dollarisation* in favour of a *euroisation* of cross-border claims, as well as an increase in the use of other currencies to a smaller extent. Before 2014 around 80% of UK resident banks lending to Russia was in USD. By 2019 the euro and the U.S. dollar represented a similar proportion of claims at around 40%.[52]

As shown in Figure 1, BIS Locational Banking data report an even more striking overall de-dollarisation, with the share of euro claims, also at around 40% in the aggregate BIS data, now almost double the share of global dollar claims to Russia.

In what follows, we exploit the granularity of the BoE confidential bank-level data on UK-

[51] Excluding other countries subject to U.S. financial sanctions as measured by the Global Sanctions Data Base (Felbermayr et al., 2020; Yalcin et al., 2025).

[52] Figure C.6 in the Appendix shows that these results are robust to winsorising lending claims to ensure that the quarterly growth of cross-border positions is bounded between −100% and +100%, as done in other studies that use this dataset (Andreeva et al., 2023; Bippus et al., 2024; Bussière et al., 2021; Lloyd et al., 2023).



(a) Lending to Russia.

(b) Number of banks lending to Russia.

Figure 3: Global banks' total lending to Russia.

Note. – Lending and number of banks are indexed to be 100 in the fourth quarter of 2013, that is the quarter before Russia's invasion of Crimea. Proportion of Russia lending out of total non-resident lending is in simple shares from 0 to 1.

Source: Bank of England's dataset on claims of UK banks on non-residents.

resident banks, rather than aggregate BIS data. Note that UK-resident global banks cover a large portion of overall lending to Russia: about a third of the pre-2014 stock, comparing panels (a) in Figures C.5 and 4. We first ask whether the propositions set out in Section 2 are consistent with aggregate patterns via a detailed decomposition exercise.

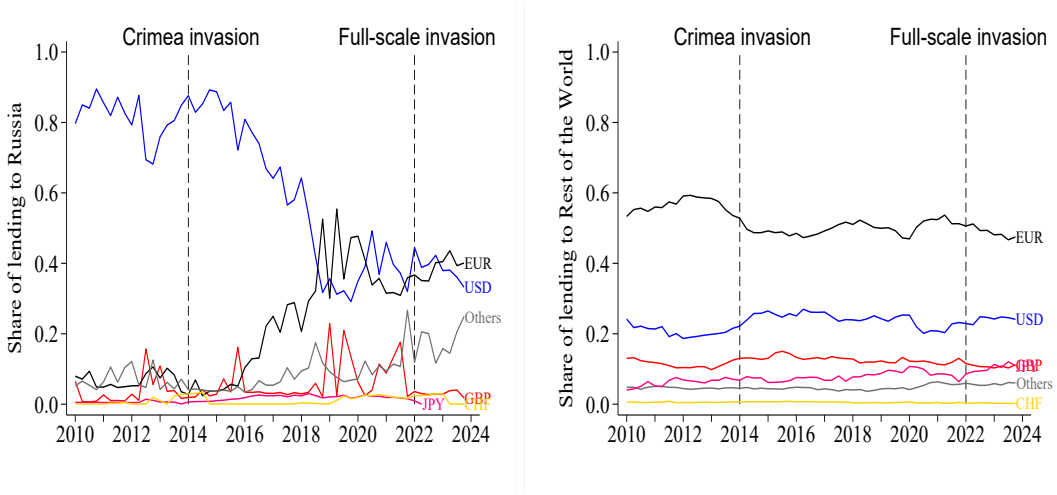
5.2 Bank-Level Margin Decomposition of Euro Claims to Russia

Which banks drove the remarkable shift in global credit flows to Russia, looking at both the large drop in total credit and the change in composition from U.S. dollars to the euro? Building on Bernard et al. (2009), we assess which margins contributed to the changes in lending to Russia performing the following decomposition on our bank-level data:

$$\Delta l^{c}_{t-\tau} = \underbrace{\sum_{b} \Delta l_{b,t-\tau}}_{\text{Entry}} + \overbrace{\sum_{b} \Delta l_{b,t-\tau}}^{\text{Exit}} + \underbrace{\sum_{b} \Delta l_{b,t-\tau}}_{\text{Continuers}} \tag{3}$$

Equation 3 decomposes the overall change Δ in lending y in currency c from time τ to t into three parts. First, the contribution by new entrants, that is banks that were not reporting lending in c to Russia at time τ, but did so at time t. Second, the contribution of exiting banks, that is banks that were reporting lending in c to Russia at time τ but no longer do so at quarter t. Finally, the contribution of increases or decreases in lending by "continuing banks" that were already lending to Russia in time τ and kept doing so, but to a different extent, in time t.

Figure 5 reports the baseline results of this exercise using 2013 Q4 as the benchmark τ for the banking claims on Russia for the U.S. dollar and the euro, respectively in panel (a) and



(a) Russia

(b) Rest of the World

Figure 4: Currency composition of lending to non-residents.

Note. – Proportion of each currency group out of total lending to Russia and Rest of the World is in simple shares from 0 to 1. Rest of the World includes only countries not subject to U.S. financial sanctions as measured by the Global Sanctions Data Base (Felbermayr et al., 2020; Yalcin et al., 2025).

Source: Bank of England's dataset on claims of UK banks on non-residents.

(b).[53] Two main points emerge.

First, the vast majority of the decrease in U.S. dollar lending is accounted for by a reduction along the intensive margin, with continuing banks lending in U.S. dollars less than before 2014. From 2017 onwards, banks also started to exit altogether dollar positions in Russia.

Second, the increase in euro lending from 2016 Q1 onwards appears to be driven by the intensive and extensive margins alike: incumbent banks increasing their supply of euros, and new entrants providing a new source for euro-denominated loans and advances, respectively.

An obvious question that arises is whether the same banks that cease to lend in dollars shift their Russian exposure to euros. As a next step we therefore further decompose the evidence in panel (d) of the same Figure 5, and specify whether euro lenders to Russia were previously exposed to dollar claims to Russia or not. The overwhelming majority of the increase in euro lending to Russia was indeed driven by banks previously exposed to dollar claims to Russia. Interestingly, half of the increase in euro lending to Russia is due to banks that were never exposed to euro Russian claims before 2014. All in all, banks exposed to Russia that continued to provide new credit after the imposition of the 2014 sectoral sanctions overwhelmingly did so in euros rather than in dollars.

A second, related question is the nationality of the UK-based global banks that provided euro financing to Russia after 2014 and whether new credit was dominated by banks ultimately based in non-sanctioning jurisdictions. We assign our sample of banks to a certain jurisdiction based on the nationality of its ultimate parent, and further decompose the increases in euro lending by ultimate jurisdiction of the bank. The outcome of this exercise depicted in panel (f)

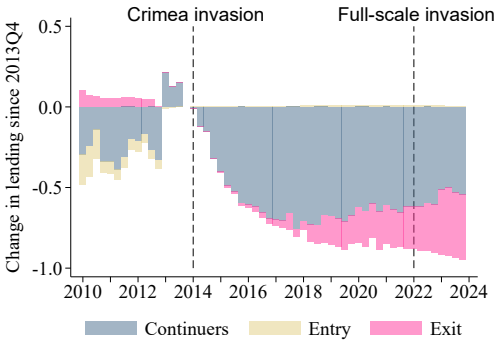
[53] Equivalent decompositions for the British pound and the residual "Other" currencies are shown in Figure C.10. For completeness, we include the corresponding charts grouping all countries other than Russia in Figure C.11 in the Appendix. Note there is no de-dollarisation, lending increases in all currencies since 2014.

of Figure 5 suggests a clear additional takeaway.[54] Although the first leg of increases in euro lending occurring in 2016 seems to be mostly driven by banks from non-sanctioning jurisdictions (the grey bars), European and Japanese lenders started to increase their euro lending to Russia by the end of 2016 and account for the vast majority of the increase in euro lending by the end of 2018. Notice that even American banks choose to denominate their Russian claims in euro.

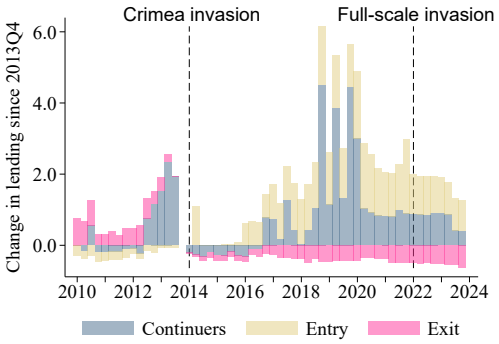
In summary, we show that, although global provision of credit to Russia substantially declined (Figure 3 and 5), banks that decided to remain active in the Russian markets denominated their claims in euros, rather than U.S. dollars. We show that a large share of the increase in euro lending comes from banks that did not have any euro exposure in Russia prior to 2014, and that the shift to euro claims occurs across non-sanctioning and sanctioning jurisdictions.

All in all, in line with Proposition 1, aggregate sanctioning coalition claims declined more than non-sanctioning coalition ones. Additionally, consistent with Proposition 2, our decomposition highlights how banks shifted to euro-denomination regardless of whether they were ultimately subject to a sanctioning jurisdiction or not. Recall from the firm-level evidence in Section 4 that euro-denominated lending was overwhelmingly directed to non-sanctioned firms after 2014. Our decomposition patterns are therefore consistent with banks priorly accustomed to lending to Russia in U.S. dollars shifting their claims to an alternative denomination in response to an increase in the perceived sanction compliance risk of lending to non-sanctioned Russian firms, particularly in U.S. dollars.

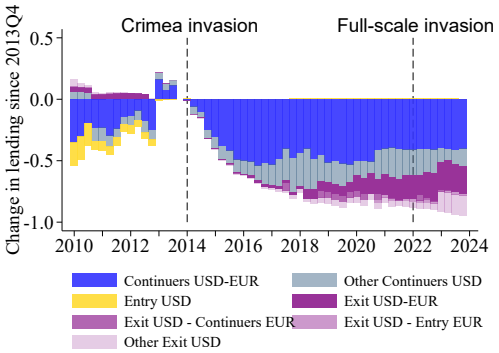
[54] To preserve anonymity, we must group extensive and intensive margin contributions, as well as suppress a small number of observations.



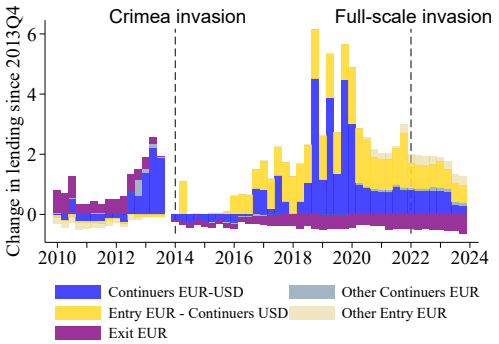
(a) USD Continuers, Entry and Exit



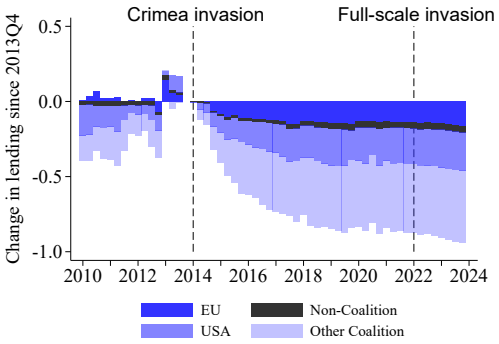
(b) EUR Continuers, Entry and Exit



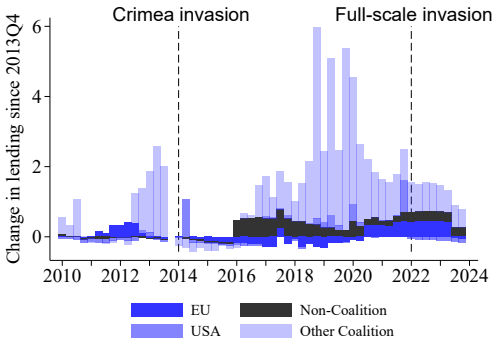
(c) USD by Exposure in other Currencies



(d) EUR by Exposure in other Currencies



(e) USD by Ultimate Parent Nationality



(f) EUR by Ultimate Parent Nationality

Figure 5: Margins Decomposition of Total Lending to Russia in USD and EUR

Note. – Bars within every quarter add up to the total change in lending to Russia for that currency with respect to 2013Q4. To preserve anonymity some observations have been suppressed, so totals might not exactly line up. In Panel (e) "Other Coalition" includes AUS, CAN, CHE, GBR, JPN, NOR; "Non-Coalition" includes ARE, BHR, CHN, EGY, KOR, IND, ISR, NGA, RUS, SGP, TUR, TWN, ZAF. In Panel (f) "Other Coalition" includes CAN, CHE, GBR, JPN; "Non-Coalition" includes BHR, CHN, KOR, NGA, RUS, TWN, ZAF.

Source: Bank of England's dataset on claims of UK banks on non-residents.

5.3 A Bank-level Empirical Analysis of Sanction-risk Driven Jurisdiction and Currency Frictions

5.3.1 Jurisdiction and Currency Frictions in Global Credit to Russia

We now turn to an empirical exercise directly testing the relevance of jurisdiction and currency de-risking margins within banks. Recall that our bank-level data are representative of the universe of banks located in the UK, a sanctioning jurisdiction, where we are able to observe claims of branches or subsidiaries of foreign banks - on a nationality basis - booked from London. This nets out any difference in residence and allows us to focus on the de-risking margins driven by the ultimate-parent jurisdiction of the banks. The parents of those UK-resident banks are indeed ultimately based in both sanctioning and non-sanctioning jurisdictions.

As a baseline to test Proposition 1, i.e. whether banks from sanctioning-coalition jurisdictions reduce claims on Russia more than banks from non-coalition jurisdictions, we first estimate the following regression:

$$l_{bt}^{RUS} = \exp\big(\ \theta_1 \cdot \text{Coalition}_b \times \text{Post}_t + k + \varphi_b + \varphi_t\big) + \varepsilon_{bt} \tag{4}$$

where l_{bt}^{RUS} are claims on Russia for bank b in quarter t aggregated across all currencies. $Post_t$, is a dummy variable that is equal to 1 after and including Q1 2014, and $Coalition_b$ is a dummy variable equal to 1 if the bank's ultimate parent is based in a country taking part in sectoral sanctions against Russia as described in Section 2.[55] In this specification, we control for bank and time fixed effects.

In order to study the currency de-risking margin we can then split banking claims by currency and estimate the following regression, as a direct test of Proposition 2, i.e. whether all banks, regardless of sanctioning status, reallocate claims away from the U.S. dollar towards non-U.S. dollar currencies:

$$\begin{aligned} l_{bct}^{RUS} = \exp\big(\ & \gamma_1 \cdot \text{Coalition}_b \times \text{Post}_t \\ & + \gamma_2 \cdot \text{Currency}_c \times \text{Post}_t \\ & + \gamma_3 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Coalition}_b \\ & + k + \varphi_{bc} + \varphi_t\big) + \varepsilon_{bct} \end{aligned} \tag{5}$$

where l_{bct}^{RUS} are claims on Russia for bank b in quarter t and currency c, for which we observe claims in U.S. dollar, euro, pound sterling, Swiss franc, Japanese yen and a residual "Other" currencies. $Currency_c$ is a currency dummy retaining the U.S. dollar as the base category. We consider two main cases: one where $Currency_c$ contrasts the base category, the U.S. dollar, against the sum of non-USD currency claims, and another where $Currency_c$ contrasts euro-denominated claims directly against U.S. dollar claims. In the appendix we include results for specifications where we also report separately euro, pound sterling, and Other-currency claims

[55] As a reminder, the coalition includes the U.S., all EU members, all EEA members, Canada, Australia, Switzerland and Japan.

relative to the U.S. dollar.[56] The interactions in Equation 4 and 5 provide a direct test for our propositions in Section 2. First, a negative sanctioning-coalition jurisdiction interaction θ_1 would indicate that banks ultimately subject to a sanctioning jurisdiction decreased claims on Russia more, relative to banks whose parents are based in non-sanctioning jurisdictions (Proposition 1), regardless of the currency denomination of claims. Second, positive estimates for both the non-coalition banks' non-USD relative to USD shift, γ_2, and the corresponding coalition-bank shift, $\gamma_2 + \gamma_3$, would indicate that banks in both non-sanctioning and sanctioning jurisdictions increased claims in non-USD currencies relative to U.S. dollars, consistent with Proposition 2. The coefficient γ_3 then tests whether the strength of this currency shift differs between coalition and non-coalition banks.

By contrast, γ_1 and $\gamma_1 + \gamma_3$ compare coalition and non-coalition banks within USD and non-USD claims, respectively. These objects therefore speak to jurisdictional differences in claims on Russia by currency component, rather than to the currency de-risking prediction itself.

To tighten identification, we expand the same logic to a panel of UK-resident banks' claims across all destination countries. We first study the jurisdictional margin for claims on Russia relative to other destinations using a bank-destination-quarter panel:

$$\begin{aligned} l_{bdt} = \exp\big(\tilde{\theta}_1 \cdot \text{Coalition}_b \times \text{Post}_t \times \text{Russia}_d \\ + k + \varphi_{bd} + \varphi_{bt} + \varphi_{dt} \big) + \varepsilon_{bdt} \end{aligned} \tag{6}$$

In contrast, when studying currency-driven de-risking in Russia, on a bank, destination, currency and time panel, the expanded estimating equation reads:

$$\begin{aligned} l_{bcdt} = \exp\big(& \tilde{\gamma}_1 \cdot \text{Coalition}_b \times \text{Post}_t \times \text{Russia}_d \\ & + \tilde{\gamma}_2 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Russia}_d \\ & + \tilde{\gamma}_3 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Coalition}_b \\ & + \tilde{\gamma}_4 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Coalition}_b \times \text{Russia}_d \\ & + k + \varphi_{bcd} + \varphi_{bt} + \varphi_{ct} + \varphi_{dt} \big) + \varepsilon_{bcdt} \end{aligned} \tag{7}$$

where the additional dimension, destination d, allows for a fourth interaction variable, $Russia_d$, i.e. a dummy equal to 1 for claims on Russia.

The interactions in Equation 7 are the all-destination analogues of those in Equation 5, but are interpreted as Russia-specific deviations relative to other destination countries and are denoted with tildes. The coefficient $\tilde{\gamma}_3$, on $Currency_c \times Post_t \times Coalition_b$, absorbs any post-2014 change in coalition banks' currency composition outside Russia. It is therefore included so that $\tilde{\gamma}_2$, $\tilde{\gamma}_4$, and the total effect $\tilde{\gamma}_2 + \tilde{\gamma}_4$ are interpreted as Russia-specific currency-margin effects, rather than as broader changes in coalition banks' global currency composition.

The fullest specification in this exercise includes bank-destination-currency, bank-time,

[56] We do not include the Swiss franc and Japanese yen in the split-currency specifications, as the variation of claims on Russia denominated in these currencies is too sparse given our fixed-effect structure.

currency-time, and destination-time fixed effects. Identification therefore comes from changes within bank-destination-currency over time, net of bank-, destination-, and currency-specific time-varying factors.

All specifications are estimated by PPML on claim levels, allowing zero-valued claim observations. To retain both intensive-margin changes and entry or exit from positive lending positions, we fill missing quarters within the relevant observed panel cells or collapsed units and set missing claims to zero.

Table 3 and Table 4 report the main bank-level evidence on claims on Russia after the 2014 sectoral sanctions. They are organized to separate the estimated interaction terms from the economic objects used to test the propositions. Panel A reports the coefficients that enter the estimating equations directly, while Panels B and C reorganize those coefficients into intuitive margins: jurisdictional differences in total claims for Proposition 1, and within-bank-group currency shifts relative to USD for Proposition 2.

Some coefficients are repeated across panels because the same estimated object enters several economically distinct comparisons. For example, the USD coalition effect is both an estimated interaction term and one component of the coalition effect in non-USD or EUR claims; repeating it makes the decomposition transparent without implying that it is separately estimated each time.

What do the results say about margins of de-risking in Russia after 2014? The evidence in Panel B of Table 3 is supportive of our Proposition 1. In the Russia-only specification, the estimated coalition effect on total claims is negative, with a PPML log coefficient of -0.686. Exponentiating this estimate implies that, after the 2014 sanctions, coalition banks reduced their total claims on Russia by about 50% more than non-coalition banks, across all currency denominations. This is consistent with a jurisdictional de-risking margin: banks whose ultimate parents are located in sanctioning jurisdictions contracted their Russia exposures more strongly than banks headquartered outside the sanctioning coalition.

The all-destination exercise in Panel B of Table 4 reinforces this interpretation. Column (1) compares claims on Russia with claims on other destinations and estimates a Russia-specific coalition effect of -0.409. The implied magnitude is a relative decline of about one third in coalition-bank claims on Russia, compared with non-coalition banks and relative to claims on other destinations. This more saturated specification therefore suggests that the Russia-only result is not merely capturing a general post-2014 contraction by coalition banks, but a Russia-specific reduction in claims by banks from sanctioning jurisdictions.

What about the currency-margin of adjustment to Russian sectoral sanctions? The results in Panel C of Table 3 support Proposition 2. In column (2), the row labelled *Within Non-Coalition: Non-USD (EUR) Shift* reports a coefficient of 1.381 for non-coalition banks. Exponentiating this estimate implies that, after the 2014 sanctions, non-USD claims on Russia relative to USD claims were approximately four times as large for non-coalition banks. The corresponding row for coalition banks, *Within Coalition: Non-USD (EUR) Shift*, reports a coefficient of 0.876, implying an increase of about 140 percent. Thus, both groups of banks shifted the currency composition of their Russia claims away from the U.S. dollar and toward non-USD currencies.

Table 3: Bank Claims on Russia after the 2014 Sectoral Sanctions: Jurisdictional and Currency Margins

	(1) Total Claims	(2) Non-USD vs. USD	(3) EUR vs. USD
Panel A. Estimated Interaction Terms			
Coalition × Post (θ_1)	-0.686*		
	(0.416)		
Coalition × Post (γ_1)		-0.584**	-0.584**
		(0.289)	(0.290)
Currency × Post (γ_2)		1.381**	2.014***
		(0.680)	(0.642)
Currency × Post × Coalition (γ_3)		-0.505	-0.739
		(0.710)	(0.694)
Panel B. Jurisdictional Margin: Total Claims			
Between: Coalition Effect, Total Claims (θ_1)	-0.686*		
	(0.416)		
Panel C. Currency Margin: Claims Relative to USD			
Between: Coalition Effect, USD Claims (γ_1)		-0.584**	-0.584**
		(0.289)	(0.290)
Within Non-Coalition: Non-USD (EUR) Shift (γ_2)		1.381**	2.014***
		(0.680)	(0.642)
Between: Difference in Non-USD (EUR) Shift (γ_3)		-0.505	-0.739
		(0.710)	(0.694)
Within Coalition: Non-USD (EUR) Shift ($\gamma_2 + \gamma_3$)		0.876***	1.275***
		(0.277)	(0.349)
Between: Coalition Effect, Non-USD (EUR) Claims ($\gamma_1 + \gamma_3$)		-1.089	-1.323
		(0.850)	(0.823)
Observations	6,716	10,412	7,967
Pseudo R2	0.844	0.804	0.790
Currency Definition	Collapsed	Non-USD vs. USD	EUR vs. USD
Bank FE	✓		
Bank-currency FE		✓	✓
Quarter FE	✓	✓	✓

Notes. The dependent variable is claims on Russia. Column (1) collapses claims across currencies to the bank-quarter level and estimates the coalition effect on total claims. Column (2) keeps the bank-currency-quarter panel and compares claims denominated in all non-USD currencies to claims denominated in USD. Column (3) keeps only USD and EUR claims and compares EUR-denominated claims to USD-denominated claims. Entries are PPML log coefficients or linear combinations of PPML log coefficients. Standard errors are clustered by bank and quarter. In the row labels, "Within" denotes currency-category shifts relative to USD within the indicated bank group, while "Between" denotes coalition versus non-coalition comparisons. "Non-USD (EUR)" means non-USD in column (2) and EUR in column (3). USD and non-coalition banks are the omitted categories. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table 4: Bank Claims on Russia Relative to Other Destinations after the 2014 Sectoral Sanctions: Jurisdictional and Currency Margins

	(1) Total Claims	(2) Non-USD vs. USD	(3) EUR vs. USD
Panel A. Estimated Interaction Terms			
Coalition × Post × Russia ($\tilde{\theta}_1$)	-0.409***		
	(0.057)		
Coalition × Post × Russia ($\tilde{\gamma}_1$)		-0.326***	-0.222**
		(0.104)	(0.087)
Currency × Post × Russia ($\tilde{\gamma}_2$)		1.339***	1.790***
		(0.517)	(0.566)
Currency × Post × Coalition ($\tilde{\gamma}_3$)		-0.312	-0.382
		(0.380)	(0.401)
Currency × Post × Russia × Coalition ($\tilde{\gamma}_4$)		-0.491	-0.494
		(0.539)	(0.593)
Panel B. Jurisdictional Margin: Total Claims			
Between: Coalition Effect, Total Claims ($\tilde{\theta}_1$)	-0.409***		
	(0.057)		
Panel C. Currency Margin: Claims Relative to USD			
Between: Coalition Effect, USD Claims ($\tilde{\gamma}_1$)		-0.326***	-0.222**
		(0.104)	(0.087)
Within Non-Coalition: Non-USD (EUR) Shift ($\tilde{\gamma}_2$)		1.339***	1.790***
		(0.517)	(0.566)
Between: Difference in Non-USD (EUR) Shift ($\tilde{\gamma}_4$)		-0.491	-0.494
		(0.539)	(0.593)
Within Coalition: Non-USD (EUR) Shift ($\tilde{\gamma}_2 + \tilde{\gamma}_4$)		0.847***	1.295***
		(0.075)	(0.088)
Between: Coalition Effect, Non-USD (EUR) Claims ($\tilde{\gamma}_1 + \tilde{\gamma}_4$)		-0.818*	-0.716
		(0.464)	(0.544)
Observations	567,842	840,654	620,720
Pseudo R2	0.965	0.951	0.949
Currency Definition	Collapsed	Non-USD vs. USD	EUR vs. USD
Bank-destination FE	✓		
Bank-destination-currency FE		✓	✓
Bank-quarter FE	✓	✓	✓
Destination-quarter FE	✓	✓	✓
Currency-quarter FE		✓	✓

Notes. The dependent variable is bank claims by destination. Column (1) collapses claims across currencies to the bank-destination-quarter level. Columns (2) and (3) keep the bank-destination-currency-quarter panel and compare non-USD or EUR claims to USD claims. Entries are PPML log coefficients or linear combinations of PPML log coefficients. The coefficients in Panels B and C are Russia-specific effects relative to other destinations. In Panel A, Currency × Post × Coalition is reported because it is estimated in the all-destination currency regressions; Panel C focuses on Russia-specific margins and therefore uses the interactions with Russia. Standard errors are clustered by bank, destination, and quarter. In the row labels, "Within" denotes currency-category shifts relative to USD within the indicated bank group, while "Between" denotes coalition versus non-coalition comparisons. "Non-USD (EUR)" means non-USD in column (2) and EUR in column (3). USD and non-coalition banks are the omitted categories. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Column (3) shows that this currency shift is especially pronounced for the euro. The *Within Non-Coalition: Non-USD (EUR) Shift* row reports a coefficient of 2.014, implying that EUR claims relative to USD claims were about 7.5 times as large for non-coalition banks after the sanctions. The corresponding coalition-bank effect is 1.275, implying a little more than a 3.5-fold increase. These estimates indicate that the broad non-USD shift documented in column (2) is strongly reflected in a shift toward euro-denominated claims.

The row labelled *Between: Difference in Non-USD (EUR) Shift* is negative in both columns, but not statistically significant. This means that the estimates do not reject the null that coalition and non-coalition banks shifted away from USD by the same amount. In other words, the currency-composition response appears to be common across bank groups, rather than concentrated only among banks from sanctioning jurisdictions.

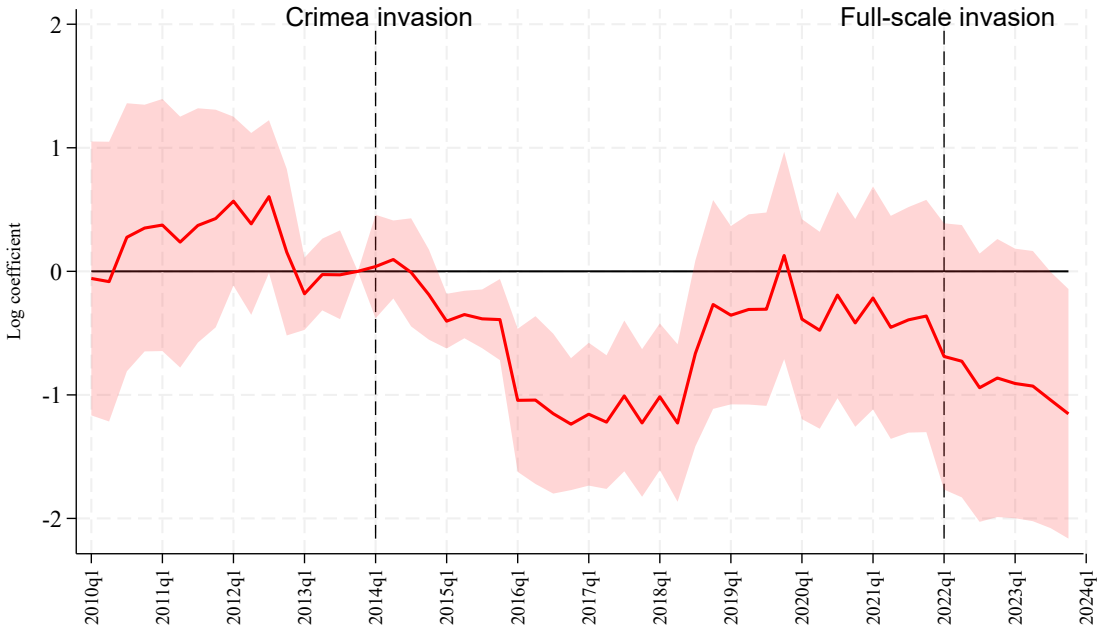
The all-destination exercise in Panel C of Table 4 reinforces the same conclusion. In column (2), non-USD claims on Russia relative to USD claims were approximately four times as large for non-coalition banks, while the corresponding coalition-bank shift implies an increase of about 130%. In column (3), the EUR-relative-to-USD effects are again larger: about six times for non-coalition banks and about 3.5 times for coalition banks. As in the Russia-only table, the row labelled *Between: Difference in Non-USD (EUR) Shift* is not statistically significant. Hence, relative to claims on other destinations, claims on Russia show a clear post-sanctions shift away from USD and toward non-USD currencies, especially EUR, for both coalition and non-coalition banks.

To summarise, the overall reduction in claims on Russia is stronger for banks whose ultimate parents are located in sanctioning jurisdictions, consistent with Proposition 1. At the same time, the within-bank shift away from USD and toward non-USD currencies, especially the euro, appears across both coalition and non-coalition banks, with no statistically significant difference in the strength of this currency shift across jurisdictions. This is consistent with Proposition 2: U.S. extra-territorial jurisdiction raises dollar-related sanctions-compliance risk for banks globally, not only for banks headquartered in sanctioning jurisdictions.

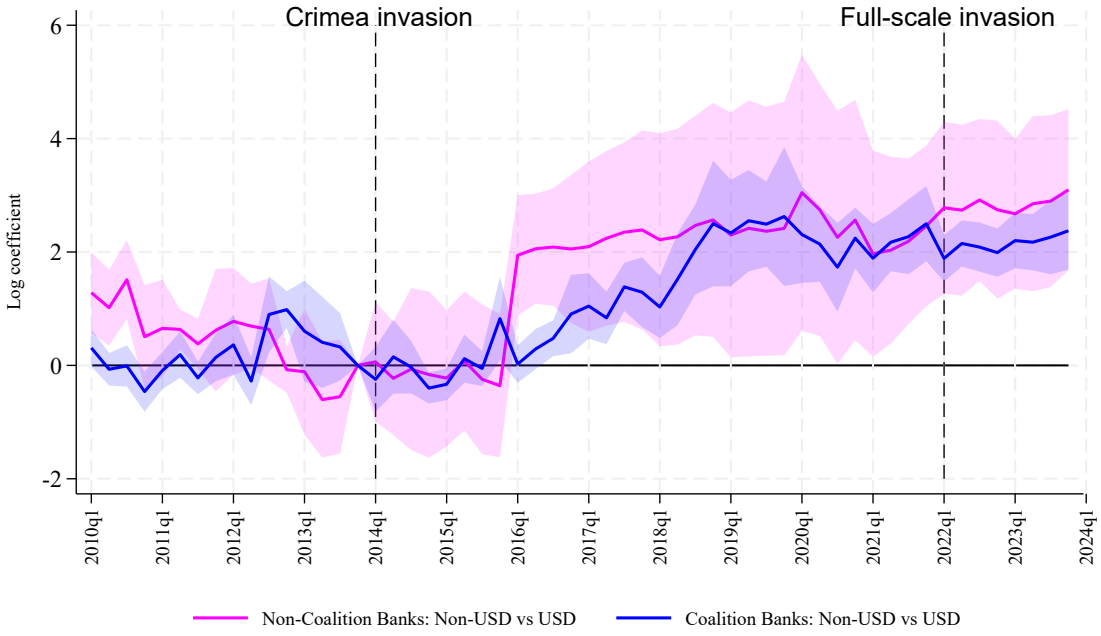
In the Appendix, we provide some further robustness to the above analysis. First, we split the non-USD currency margins in all estimable currency groups, clarifying whether other non-USD currencies behave similarly to the euro. We are unable to report claims in Swiss franc and Japanese yen in this exercise as they are too sparse within our fixed-effects, so the currency split is between EUR, GBP, the residual OTH category, likely to contain domestic currencies such as the ruble, and the base category, the U.S. dollar. Table C.9 shows that, in the Russia-only sample, the shift away from USD is driven primarily by euro-denominated claims. Both non-coalition and coalition banks increase EUR claims relative to USD claims after the sanctions, while the evidence for GBP is weaker and the residual Other-currency category is less systematic. Table C.11 reaches a similar conclusion in the all-destination specification: the EUR margin is the largest and cleanest component of the broader non-USD shift, with some positive evidence for GBP and OTH but smaller inconsistent across specifications. The remaining evidence presented in Appendix Tables C.8 and C.10 show that the currency-margin results are robust to alternative fixed-effect structures in both the Russia-only and all-destination specifications. The positive shift from USD toward non-USD claims, especially EUR, persists across these variants.

Figure 6: Bank Claims on Russia after the 2014 Sectoral Sanctions: Dynamic Effects

(a) **Jurisdictional Margin: Total Claims**



(b) **Currency Margin: Non-USD Claims Relative to USD**



Notes. Panel A plots the dynamic analogue of the jurisdictional-margin coefficient θ_1, which is reported in column (1) of Table 3. The series is labelled as the coalition effect on total claims and measures the difference in claims on Russia between coalition and non-coalition banks in each quarter, relative to the omitted base period. Panel B plots the dynamic analogues of the currency-margin coefficients reported in column (2) of Table 3. The series labelled "Within Non-Coalition: Non-USD Shift" corresponds to γ_{2t}, the quarter-specific shift in non-USD claims relative to USD claims among non-coalition banks. The series labelled "Within Coalition: Non-USD Shift" corresponds to $\gamma_{2t} + \gamma_{3t}$, the corresponding shift among coalition banks. Coefficients are PPML log-point estimates; shaded areas report confidence intervals. The vertical lines mark the 2014 sectoral sanctions and the 2022 invasion of Ukraine.

Source: Bank of England's dataset on claims of UK banks on non-residents.

What about the dynamics of the jurisdictional and currency margins documented above? Figure 6 reports the dynamic analogues of the main Russia-only estimates in Table 3. Panel A plots the time-varying version of the jurisdictional-margin coefficient θ_1, labelled as the coalition effect on total claims. Panel B plots the dynamic currency-margin effects corresponding to column (2) of Table 3: the *Within Non-Coalition: Non-USD Shift*, γ_{2t}, and the *Within Coalition: Non-USD Shift*, $\gamma_{2t} + \gamma_{3t}$.

First, notice how there is no evidence of pre-trends in either of our main channels of interest, which is consistent with coordination on EU-U.S. sectoral sanctions remaining uncertain until the diplomatic agreement reached in July 2014.

Second, the figure shows that the timing of the two margins differs. The jurisdictional de-risking margin in Panel A emerges earlier: coalition banks begin to reduce claims on Russia relative to non-coalition banks shortly after the 2014 sanctions, with the differential becoming most pronounced in the following years. The effect then partially reverses and is less precisely estimated before 2022, although the coefficient turns down again after the full-scale invasion. One interpretation of the partial reversal in Panel A is that coalition banks gradually resumed some Russia lending, but did so through a different composition of claims - for example more non-USD lending, different borrowers, or exposures less directly affected by the initial sectoral sanctions. By contrast, the currency margin in Panel B appears later, around late 2015 and early 2016, but is highly persistent once it emerges: both coalition and non-coalition banks shift Russia claims away from USD and towards non-USD currencies.

The later emergence of the currency margin raises a natural question about transmission. One possibility is that currency substitution requires new lending, i.e. refinancing needs kicking-in: the dollar-to-non-dollar margin could only become visible once Russian borrowers returned to international credit markets and new claims were originated or rolled over (see Section 2). Another possibility is that Russian demand-side policies and borrower preferences also encouraged de-dollarisation. These channels are not mutually exclusive. Both are consistent with the currency-specific friction emphasized in Section 2: sanctions-compliance and settlement risk can matter to borrowers as well as lenders.

The next subsection therefore asks whether similar currency and jurisdictional margins appear outside Russia, where Russian de-dollarisation policies cannot directly explain the results. We adapt the bank-level specifications to non-Russia emerging-market destinations and examine whether banks exposed to Russia at the time of the Crimea invasion subsequently adjust their lending and currency composition elsewhere. This spillover exercise helps isolate the role of banks' own sanctions-compliance risk perceptions from Russia-specific borrower-side responses.

5.3.2 Sanction Risk Spillovers on Total and USD Denominated Claims on other Emerging Markets

We now ask whether the 2014 Russia sanctions affected banks' lending outside Russia, i.e. whether banks internalised sanction compliance risk along either the jurisdiction or currency margins, specifically for destinations that were more likely to be sanctioned in the future. The first exercise we provide excludes Russia from the estimating sample and tests whether banks more directly exposed to Russia, especially banks headquartered in sanctioning-coalition

jurisdictions, subsequently adjusted their claims to other destinations. The dependent variable collapses claims across currencies, so this first specification speaks to total lending rather than currency composition. We estimate the following PPML specification:

$$l_{bdt} = \exp\left(\theta_1^S \cdot \text{BankGroup}_b \times \text{Post}_t \times \text{Destination}_d + k + \varphi_{bd} + \varphi_{bt} + \varphi_{dt}\right) + \varepsilon_{bdt} \tag{8}$$

where l_{bdt} denotes total claims by bank b on non-Russia destination d in quarter t, collapsed across currencies. The sample excludes Russia. BankGroup_b is defined in turn as: banks headquartered in sanctioning-coalition jurisdictions; banks with positive Russia claims in 2013Q4; and banks satisfying both conditions, $\text{Coalition}_b \times \text{Russia Position}_b^{2013Q4}$. Our preferred spillover treatment is the last group, which captures banks both exposed to Russia at the time of the Crimea invasion and headquartered in jurisdictions directly participating in the sanctions coalition. The coefficient θ_1^S captures whether the relevant bank group changed total claims to destination d after the 2014 sanctions, relative to banks outside that group. The fixed effects are bank-destination, bank-quarter, and destination-quarter fixed effects, and standard errors are clustered by bank, destination, and quarter. We vary Destination_d to capture destinations with different forward-looking geopolitical risk. We first use broad destination groups, including non-Russia countries outside advanced economies and the EU, emerging-market destinations, the original BICS countries excluding Russia, and a broader BICS+ group that includes all countries that had joined BRICS by 2025.[57] The BICS and BICS+ groups are useful proxies for destinations potentially perceived as more geopolitically exposed after the Russia sanctions. We complement these groupings with quartiles of geopolitical distance from the United States, based on UN ideal-point distance measures from Bailey et al. (2017) fixed at 2000-2013. In those specifications, the first quartile interaction is omitted, and the reported coefficients compare destinations in quartiles 2, 3 and 4 with the omitted reference group, i.e. the "Western bloc" more closely aligned with the United States. Table C.12 shows the intersection of the BRICS+ group with geopolitical distance quartiles over 2000-2013.

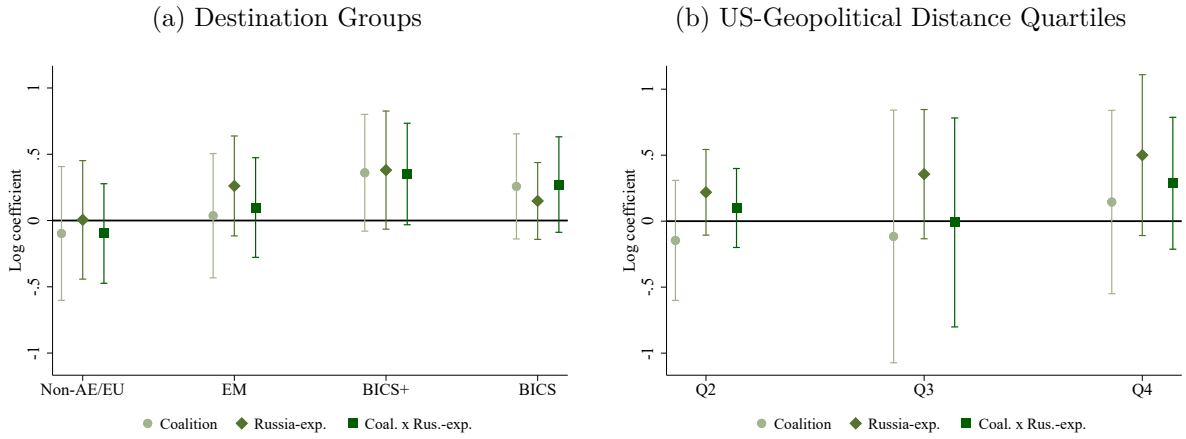
Figure 7 plots the estimated θ_1^S coefficients from Equation 8. Panel (a) reports estimates for the destination-group specifications, while Panel (b) reports estimates for geopolitical-distance quartiles, with Q1 omitted. The three series correspond to the three alternative definitions of BankGroup_b: coalition banks, Russia-exposed banks, and coalition × Russia-exposed banks. The full regression results underlying the figure are reported in Appendix Tables C.13, C.14, and C.15, respectively.

The figure shows little evidence that the Russia shock generated spillovers in total claims to non-Russia destinations. Across both the destination-group specifications and the geopolitical-distance quartiles, the estimated coefficients are generally imprecise and do not indicate a systematic change in lending by coalition, Russia-exposed, or coalition × Russia-exposed banks.

What about spillovers on the currency de-risking margin? To investigate this, we turn to a currency-level specification that mirrors Equation 8, but keeps the currency denomination of claims instead of collapsing claims across currencies. This allows us to test whether banks

[57] Including, on top of the original group, Egypt, Ethiopia, Iran, the UAE and Indonesia.

Figure 7: Jurisdiction and Russia-Exposure Spillovers to Total Claims



Notes. The figure reports PPML log coefficients from the total-claims spillover specification. The dependent variable is bank claims to non-Russia destinations, collapsed across currencies to the bank-destination-quarter level. Panel (a) reports coefficients for destination groups: all non-advanced-economy/non-EU destinations, emerging-market destinations, BICS+, and the original BICS countries excluding Russia. Panel (b) reports coefficients for quartiles of geopolitical distance from the United States based on UN ideal-point distance from Bailey et al. (2017); Q1 is the omitted reference quartile. "Russia-exposed" denotes banks with positive Russia claims in 2013Q4. "Coalition × Russia-exposed" denotes Russia-exposed banks whose ultimate parent is headquartered in a sanctioning-coalition jurisdiction. All specifications exclude Russia and include bank-destination, bank-quarter, and destination-quarter fixed effects. Standard errors are clustered by bank, destination, and quarter. Vertical bars report 95 percent confidence intervals.

Source: Bank of England's dataset on claims of UK banks on non-residents.

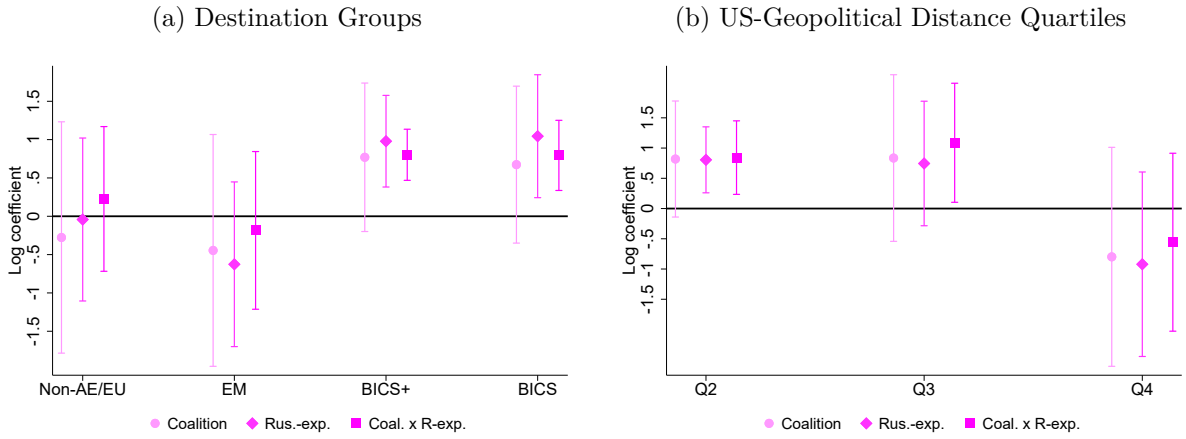
exposed to Russia, especially those headquartered in sanctioning-coalition jurisdictions, shifted claims to non-Russia destinations away from USD and toward EUR after the 2014 sanctions. We estimate the following PPML specification:

$$\begin{aligned} l_{bcdt} = \exp\big(&\gamma_1^S \cdot \text{BankGroup}_b \times \text{Post}_t \times \text{Destination}_d \\ &+ \gamma_2^S \cdot \text{Currency}_c \times \text{Post}_t \times \text{Destination}_d \\ &+ \gamma_3^S \cdot \text{Currency}_c \times \text{Post}_t \times \text{Destination}_d \times \text{BankGroup}_b \\ &+ k + \varphi_{bcd} + \varphi_{bt} + \varphi_{dt} + \varphi_{ct}\big) + \varepsilon_{bcdt} \end{aligned} \tag{9}$$

where l_{bcdt} denotes claims by bank b on non-Russia destination d in currency c and quarter t. The sample excludes Russia and keeps USD and EUR claims. Currency_c is equal to one for EUR-denominated claims, with USD as the omitted category. The fixed effects are bank-destination-currency, bank-quarter, destination-quarter, and currency-quarter fixed effects.

Having shown above that claims on Russia shifted away from USD and toward EUR after the 2014 sanctions, we therefore now ask whether the same banks adjusted the currency denomination of claims to non-Russia destinations. The results are strongly suggestive of de-dollarisation spillovers to jurisdictions less aligned with the West, plausibly driven by banks' exposure to the Russian 2014 sectoral sanctions shock. Figure 8 plots the differential EUR-vs-USD response, γ_3^S, while Appendix Tables C.16, C.17, and C.18 report the full estimates. The strongest pattern is not for coalition banks in general, but for banks with pre-existing Russia exposure, especially in the BICS and BICS+ destination groups. Banks that were both

Figure 8: De-Dollarisation Spillovers by Jurisdiction and Russia Exposure



Notes. The figure plots the coefficient γ_3^S from Equation 9, corresponding to EUR × Post × Destination × BankGroup. This coefficient measures the additional post-2014 EUR-vs-USD shift of the indicated bank group relative to banks outside that group. BankGroup is defined in turn as coalition banks, Russia-exposed banks, and coalition × Russia-exposed banks. Panel (a) reports destination-group interactions. Panel (b) reports geopolitical-distance quartile interactions, with Q1 omitted. The sample excludes Russia and keeps USD and EUR claims. Vertical bars report 95 percent confidence intervals. Standard errors are clustered by bank, destination, and quarter.

Source: Bank of England's dataset on claims of UK banks on non-residents.

Russia-exposed and headquartered in coalition jurisdictions, the differential EUR-vs-USD shift is about $e^{0.80} - 1 \simeq 120\%$ for BICS/BICS+ destinations.

The geography of the effect is revealing. BICS and BICS+ are groups that over the last decade have become loosely institutionalised as a relatively explicitly non-Western bloc. The geopolitical-distance quartiles point in the same direction but are noisier. Q4 includes countries far from the U.S. in UN-voting space, but it is economically heterogeneous, including U.S. allies, very poor countries, and already heavily sanctioned economies. Q2 and Q3 are therefore also informative: many countries in those quartiles are not especially aligned with the U.S., and Russia itself falls in Q2 in the classification reported in Appendix Table C.12. For coalition × Russia-exposed banks, the differential EUR-vs-USD response is about $e^{0.84} - 1 \simeq 130\%$ in Q2 and about $e^{1.09} - 1 \simeq 200\%$ in Q3, relative to banks that were not both coalition and Russia-exposed. The corresponding Q4 estimate is negative and statistically insignificant, consistent with the greater heterogeneity of that quartile. Coalition × Russia-exposed banks therefore increased the EUR denomination of claims relative to USD substantially more in Q2 and Q3 destinations after 2014. The Appendix tables C.16, C.17 and C.18, also report two linear combinations that help interpret the plotted differential effects. First, $\gamma_2^S + \gamma_3^S$ measures the EUR-vs-USD shift within the treated bank group itself: that is, whether Russia-exposed banks, or coalition × Russia-exposed banks, increased EUR-denominated claims relative to USD-denominated claims after 2014. This effect is positive across most destination definitions. Second, $\gamma_1^S + \gamma_3^S$ measures the treated bank group's relative effect on EUR claims, compared with banks outside the treated group. This effect is positive for BICS/BICS+ and some distance quartiles, suggesting that the spillover is not only a relative fall in USD claims but also, in those destinations, a relative strengthening of EUR-denominated claims.

Taken together, the bank-level evidence presented in this Section has shown that the 2014

sectoral sanctions generated both jurisdictional and currency-margin responses. However, the currency margin de-dollarisation clearly emerges as the starkest and more persistent adjustment. Claims on Russia shifted away from the U.S. dollar and toward the euro, and the same de-dollarisation margin appears in non-Russia emerging-markets destinations for banks most exposed to the Russia shock. These results establish that sanction risk can alter the usage of the U.S. dollar in global financial flows. This points to a higher level of substitutability of the dominant currency than suggested in the literature, which has long emphasised the inertia in international currency equilibria, driven by network effects (Gopinath & Itskhoki, 2022). We now turn to an analysis of joint quantity and price movements in the Russian syndicated loans market, which will provide a quantification of substitutability of the U.S. dollar as a vehicle currency.

6 Evidence on Prices and Quantities from the Russian Syndicated Loans Market

In this section we study a sample of large cross-border loans to Russia for which we can observe both prices and quantities, relying on the universe of DealScan syndicated loans. We jointly examine the shift in prices and quantities along jurisdiction and currency-specific margins for loans subject to high levels of sanction-compliance risk, which complements the evidence presented so far in two ways. First, it can help disentangle demand and supply effects in credit markets subject to sanction compliance risk. Second, demand elasticity and substitutability are at the core of theoretical models of geoeconomic power (Clayton, Maggiori, & Schreger, 2025a, 2025b): this is where loans data on the volume and prices of cross-border flows to Russia are highly complementary to the stock of cross-border claims studied in Section 5.

6.1 Stylised Facts

We begin with documenting stylised facts on the change in the volume of syndicated loans originated to Russian borrowers, and their corresponding prices, around the 2014 invasion of Crimea and subsequent imposition of international sanctions. We focus on whether we can detect any differential patterns along the usual jurisdiction and currency margins, namely sanctioning banks vs non-sanctioning coalition banks as well as U.S. dollar vs. non-dollar loans. Our variables of interest (See Section 3 for more details on the sample of DealScan loans we observe) are aggregated at the borrower-lender-year or borrower-lender-currency-year level. At the highest level of disaggregation of our estimating dataset, we can therefore observe the annual loan volume provided by the same lender to the same borrower in the same currency in any given year, and, where available, its volume-weighted average price counterpart.

Figure 9 reports both variables split by whether the originating bank was ultimately headquartered in a sanctioning jurisdiction or not.[58] As expected, the panel on the left shows that annual lending volumes to Russia increased after 2014 for non sanctioning coalition banks, while the distribution of lending volumes became more concentrated around the pre-Crimea median for sanctioning coalition banks. The median value-weighted spread applied to Russian loans by non-sanctioning coalition banks increased by about 50bp, while the one applied by sanctioning coalition banks remained constant.

Figure 10 reports the equivalent charts looking along the currency split of Russian syndicated loans volumes and prices. We note two main points. On the one hand, the panel on the left shows that euro yearly lending volumes increased markedly relative to dollar loan volumes.[59] Importantly, the volume-weighted median spread applied to euro loans *declined* after 2014, while dollar median spreads slightly increased.

Of course, to give any economic interpretation to the raw data patterns, one needs to disentangle composition effects along all the key dimensions of interest. Similarly to the previous

[58] The definition of sanctioning jurisdiction is the same as in Section 5. It comprises banks whose ultimate parent is based in the U.S., EU members and EEA associated countries, Australia, Canada, Switzerland and Japan.

[59] Figure D.12 in the appendix shows that rouble yearly lending volumes also increased markedly relative to dollar loan volumes. We barely observe any prices for rouble loans in DealScan after 2014, so we are unable to analyse the shift in prices for rouble syndicated loans.

section we therefore now proceed to disentangle the shift due to jurisdiction and currency frictions relying on interactions and a rich set of fixed-effects, looking at both loan volumes and prices.

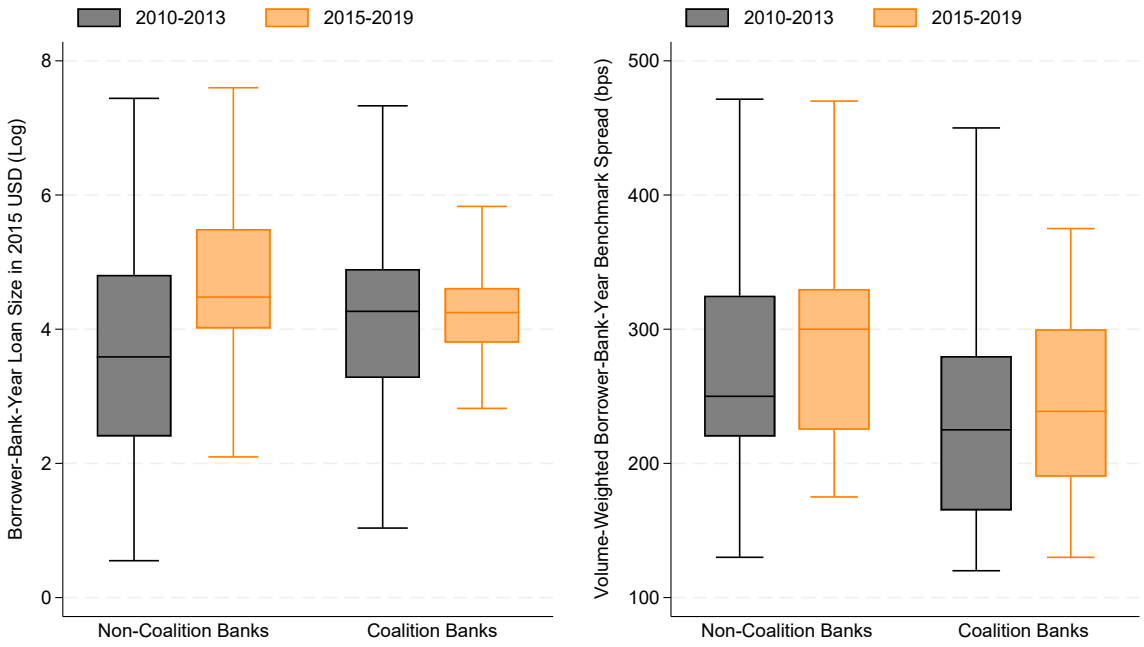


Figure 9: Russian Syndicated Loans Size and Spread by Bank Jurisdiction Before and After 2014.

Note. – Averaged loan size and spread for bank-borrower-currency-year observations on the universe of Russian syndicated loans. Coalition banks are banks whose ultimate parent is based in a sanctioning coalition country. Loan size is computed from the US dollar converted tranche amount deflated to 2015 US prices. Spreads refer to the all-in drawn spread over the benchmark free rate.

Source: DealScan and authors' calculations.

6.2 Disentangling Jurisdiction and Currency Margins in Loan Prices and Quantities

An important challenge to identifying the differential credit supply response to financial sanctions is that borrower characteristics may vary across Russian and non-Russian firms, and sanction risk may also affect borrower credit demand. The same concern arises when studying the currency denomination of loans to Russian borrowers, since currency choice may reflect borrower hedging motives, trade invoicing, or balance-sheet exposures rather than lender supply.[60] Our fixed-effect structure is designed to absorb these borrower-level demand drivers by comparing lending across lenders and currencies within the same borrower-year. As highlighted by Elliott et al. (2024) in the context of banks and non-banks, two features of the syndicated lending market further help isolate the lender-side response. First, syndicated loans involve multiple lenders to the same borrower, allowing us to compare how different institutions lend to the

[60]For example, sales and their geographical distribution have been shown to be associated with the currency denomination of debt among large firms in developed countries (Colacito et al., 2021).

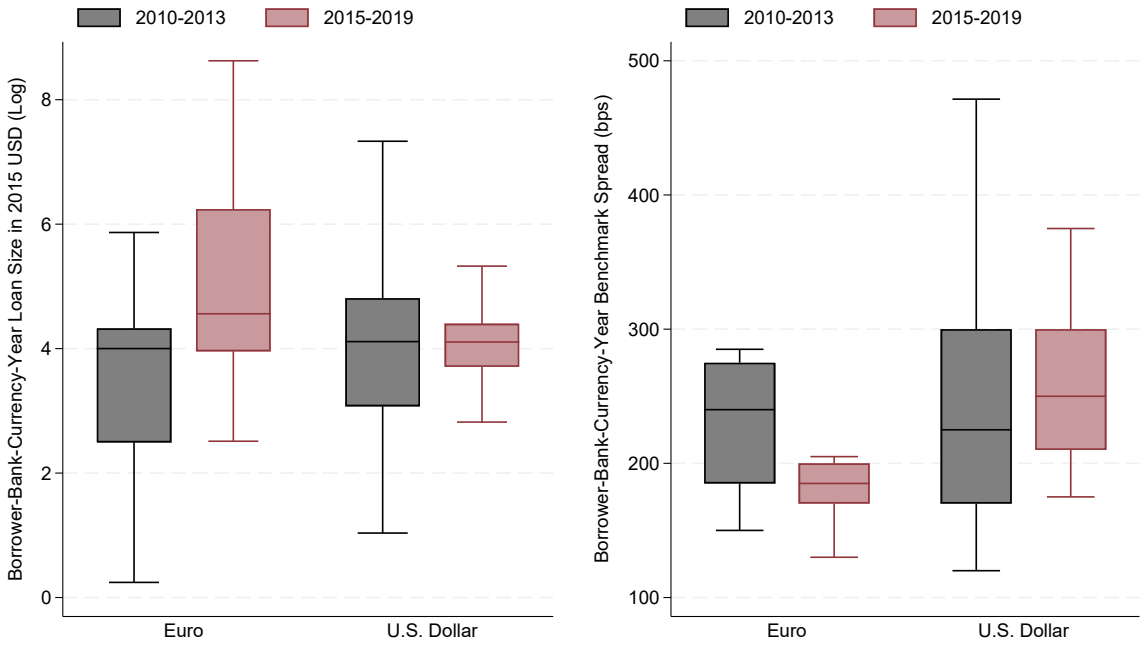


Figure 10: Russian Syndicated Loans Size and Spread by Currency Before and After 2014.

Note. – Averaged loan size and spread for bank-borrower-currency-year observations on the universe of Russian syndicated loans. Loan size is computed from the US dollar converted tranche amount deflated to 2015 US prices. Spreads refer to the all-in drawn spread over the benchmark free rate.

Source: DealScan and authors' calculations.

same firm. Second, while the borrower selects the lead arranger, other syndicate participants are typically assembled through a book-building process managed by the arranger, limiting direct borrower control over the identity of participant lenders. Finally, because syndicated-loan prices are quoted as spreads over benchmark rates, spread regressions remove much of the mechanical pricing difference associated with different money-market paths across currencies.

We begin by studying the lender-jurisdiction margin: whether, after the 2014 sectoral sanctions, coalition and non-coalition lenders differentially changed the quantity and price of syndicated credit supplied to Russian borrowers. The baseline specification is estimated on a borrower-lender-year panel of Russian and other emerging-market borrowers, aggregating loan volumes across currencies. The estimating equation reads:

$$\begin{aligned} Y_{blt} = \; & \beta_1 \cdot Post_t \times Coalition_l \times Russia_b \\ & + \beta_2 \cdot Coalition_l \times Russia_b \\ & + k + \varphi_{bt} + \varphi_{lt} + \varepsilon_{blt} \end{aligned} \tag{10}$$

where the dependent variable is either annual syndicated-loan volume or the volume-weighted benchmark spread on priced syndicated credit extended by lender l to borrower b and originating in year t. The dummy $Post_t$ equals one from 2015 onward, with 2014 excluded from the

estimation sample.[61] $Coalition_l$ equals one when the country of the lender's ultimate parent is part of the sanctioning coalition, and $Russia_b$ identifies Russian borrowers. We include borrower-year fixed effects, φ_{bt}, and lender-year fixed effects, φ_{lt}. The borrower-year fixed effects absorb time-varying borrower credit demand, including borrower-specific exposure to sanctions, while the lender-year fixed effects absorb time-varying lender supply shocks common across borrowers. Level quantity specifications are estimated by PPML to retain zero lending observations. Log quantity specifications are estimated by OLS on positive lending observations, while spread and log-spread specifications are estimated by OLS on observations with observed benchmark spreads.

The coefficient of interest is β_1. It measures whether, after sanctions, coalition lenders changed their lending to Russian borrowers differently from non-coalition lenders, relative to the corresponding difference for non-Russian emerging-market borrowers. In the price specifications, a positive β_1 would indicate that coalition lenders require a higher spread to lend to Russian borrowers after sanctions, consistent with a sanction-compliance or enforcement-risk premium. In the quantity specifications, a negative β_1 indicates that coalition lenders reduce lending to Russian borrowers relative to non-coalition lenders, consistent with substitution away from sanctioning-jurisdiction lenders.

We then turn to vehicle-currency substitution — the key margin of substitution highlighted in Section 5. We restrict attention to syndicated credit denominated in either U.S. dollars or euros, and estimate the following specification on a borrower-lender-currency-year panel:

$$\begin{aligned} Y_{blct} = \; & \beta_1 \cdot Post_t \times EUR_c \times Russia_b \\ & + \beta_2 \cdot EUR_c \times Russia_b \\ & + k + \varphi_{bt} + \varphi_{lct} + \varepsilon_{blct} \end{aligned} \tag{11}$$

where the dependent variable is either annual syndicated-loan volume or the volume-weighted benchmark spread on priced syndicated credit extended by lender l to borrower b, denominated in currency c, and originating in year t. The dummy EUR_c equals one for euro-denominated credit, with U.S. dollar-denominated credit as the omitted currency category. We include borrower-year fixed effects, φ_{bt}, and lender-currency-year fixed effects, φ_{lct}. Borrower-year fixed effects absorb borrower demand and borrower-specific sanction exposure in each year, while lender-currency-year fixed effects absorb lender-specific supply shocks within each currency-year. For the level quantity specification, the estimating sample is an active-relationship USD/EUR currency-choice panel: borrower-lender relationships are retained when they are active in at least one of the two vehicle currencies, so that zero lending in one currency is interpreted relative to an active lending relationship in the other. Log quantity specifications condition on positive lending, while price specifications condition on observed benchmark spreads. In quantity specifications, β_1 measures whether, after sanctions, Russian borrowers shift syndicated

[61] We exclude 2014 from the estimation sample because sanctions were introduced during the year: Russia's invasion of Crimea occurred in February, while the main U.S. and EU sectoral sanctions were agreed and implemented only later in 2014. Since DealScan announcement dates do not always identify when the relevant lending decision was made, excluding 2014 avoids assigning transition-year loans mechanically to either the pre- or post-sanction regime.

borrowing toward euros relative to U.S. dollars, compared with the corresponding currency shift among non-Russian emerging-market borrowers. In price specifications, β_1 measures the analogous post-sanctions change in the euro-dollar spread differential for Russian borrowers relative to non-Russian emerging-market borrowers. A negative coefficient in the spread regressions is consistent with an increase in the cost of dollar credit intermediation - as again prices are measured as spread over the risk-free rate - relative to the euro, which we would interpret as evidence of a sanction-risk related dollar settlement-risk premium.

The quantity and price coefficients can also be combined to summarize the degree of euro-dollar substitutability in syndicated lending, i.e. the relative response of quantity and prices. Because benchmark spreads are observed only for a subset of loans, we compute this reduced-form elasticity using specifications in which both the log quantity response and the log spread response are estimated on the same set of borrower-lender-currency-year observations with observed spreads. This ensures that the elasticity does not combine a quantity response estimated on the broader lending panel with a price response estimated on the smaller priced-loan sample. The resulting elasticity scales the post-sanctions shift in euro-denominated loan volumes relative to U.S. dollar loan volumes by the corresponding change in the euro-dollar spread differential. It therefore summarizes how strongly Russian borrowers substitute towards euro-denominated syndicated credit when U.S. dollar credit becomes relatively more expensive.

6.3 Prices, Quantities and the Substitutability of Vehicle Currencies in International Credit Flows

Table 5 reports our baseline results, bringing together the lender-jurisdiction and vehicle-currency margins in a single table. Panel A focuses on lender-jurisdiction substitution by reporting the coefficient on $Post \times Russia \times Coalition$ from Equation (10). Panel B.1 focuses on vehicle-currency substitution by reporting the coefficient on $Post \times Russia \times EUR$ from Equation (11). In each panel, columns (1) and (2) report the main quantity specifications: a level-volume PPML specification that retains zero lending observations, and a log-volume OLS specification estimated on positive lending observations. Columns (3)-(6) restrict attention to observations for which benchmark spreads are reported. Columns (3) and (4) re-estimate the quantity response on this same set of priced observations, while columns (5) and (6) report the corresponding level-spread and log-spread responses. This common priced-loan sample is what allows us to compare quantity and price responses directly and to construct the reduced-form EUR-USD elasticity reported in Panel B.2.[62]

Panel A asks whether Russian borrowers, which in our loan sample are overwhelmingly non-sanctioned[63], are able to replace credit from sanctioning-coalition lenders with credit from non-coalition lenders after sanctions. The evidence is limited. Column (1) shows a large and statistically significant decline in lending by coalition lenders to Russian borrowers relative to non-coalition lenders in the broad quantity sample. This points to coalition-lender retrenchment

[62] Our results don't suggest the equivalent response ratio for sanctioning jurisdiction-lender substitutability is a meaningful object to compute.

[63] There are a low single digit number of syndicated loan deals to sectoral sanctioned firm, none of them priced, which prevent us from exploring sanctioned status heterogeneity in any meaningful way. Sanctioned-status is in any case absorbed by borrower-time fixed effects.

on the extensive margin. Beyond this broad quantity response, however, the lender-jurisdiction margin is muted. The log quantity coefficient in column (2) is small and insignificant, and in the priced-loan sample the quantity and spread coefficients are also statistically indistinguishable from zero. In other words, we find evidence that coalition lenders reduce exposure to Russian borrowers, but little evidence that non-coalition lenders are able to replace them within syndicated lending, or that remaining coalition lenders charge a clear sanction-compliance cost related price premium.

Panel B shows a much stronger substitution pattern along the vehicle-currency margin. The coefficient on $Post \times Russia \times EUR$ is positive and statistically significant across all quantity specifications: after sanctions, Russian borrowers receive more syndicated credit in euros relative to U.S. dollars, compared with the corresponding currency shift among other emerging-market borrowers. At the same time, the spread coefficients are negative and statistically significant: euro-denominated loans become cheaper relative to dollar-denominated loans for Russian borrowers.

This joint quantity-price pattern is consistent with a dollar-specific sanction compliance cost, worth about 55bp. In particular, it can be interpreted as sanction-related settlement risk in U.S. dollar clearing, given how sanction compliance risk is internalised by dollar correspondent banks (see Section 2 and Matvos and Neiman (2026)). Two clarifications are important. First, we do not identify this effect from lending to directly sanctioned firms. Loans to sanctioned firms in our syndicated-loan data are close to non-existent and none of those that exist is priced. Second, we do not make the baseline specification fully interactive in lender jurisdiction and currency as we were able to do in Section 5. Variation in jurisdiction across currencies is simply too sparce for this to be feasible in the loan-level analysis. Nonetheless, our loan-level results confirm that the currency margin response dominate over the jurisdiction one following the 2014 sectoral sanctions on Russia. The joint quantity and price responses can be used to construct a reduced-form measure of supply-side substitutability between the euro and the dollar as vehicle currencies for cross-border lending. Columns (3)-(6) in Table 5 estimate these quantity and price responses on the same set of loans with reported benchmark spreads, so the elasticity does not combine a broad quantity estimate with a narrower price sample. In column (4), the log quantity coefficient implies that euro lending rises by 0.663 log points relative to dollar lending, or about 94 percent. In column (6), the log spread coefficient implies that euro spreads fall by 0.210 log points relative to dollar spreads, corresponding to an approximately 19 percent decline in the euro-dollar spread ratio. Dividing these two log responses gives a reduced-form elasticity of about 3.16.

$$\widehat{\sigma}_{EUR/USD} \equiv \frac{d(\log L^{EUR} - \log L^{USD})}{d(\log i^{EUR} - \log i^{USD})} \approx \frac{\hat{\beta}_Q^{\log}}{\left|\hat{\beta}_P^{\log}\right|} = \frac{0.663}{0.210} \approx 3.16. \tag{12}$$

This estimate is not the same object as the broad elasticity of substitution across all foreign financial-service suppliers. It is narrower, but especially relevant for geoeconomic power exercised through financial chokepoints such as the dollar clearing system: it measures substitution between vehicle currencies when the use of sanctions raises the relative risk of dollar-denominated intermediation. In this sense, it provides a direct empirical counterpart to the elas-

ticity that disciplines how costly it is for targeted borrowers to move away from the sanctioned currency circuit. This is closely related to the substitution elasticity in the geoeconomic-power framework of Clayton, Maggiori, and Schreger (2025b), where the ability to substitute away from a sanctioned foreign financial input governs the curvature of the target economy's outside option. While Clayton, Maggiori, and Schreger (2025b) calibrate their elasticity parameter, setting $\sigma_F = 1.8$ based on trade-cost estimates for financial services in Rouzet et al. (2017), our setting estimates the corresponding currency-substitution margin directly from the observed quantity and price response to financial sanctions, i.e. the usage of geoeconomic power by an hegemon.[64] Because the estimated changes are large, Panel B.2 also reports a finite-change version of the same calculation. Instead of treating log changes as small percentage changes, this ratio converts the estimated coefficients into proportional changes before taking their ratio. Using the level quantity response on the priced-loan sample in column (3) and the log spread response in column (6), the implied finite-change ratio is $(\exp(0.690) - 1)/(1 - \exp(-0.210)) \approx 5.25$. This value is close to the elasticity of 5 that Clayton, Maggiori, and Schreger (2025b) use for traded goods, and far above the value of 1.8 they use for financial services. While these benchmarks are not directly comparable to our syndicated-lending setting, the comparison is informative: it suggests that the elasticity of substitution across financial services may be substantially higher when substitution occurs across vehicle currencies within the same lending market than off-the-shelf financial-services calibrations imply.

Currency-specific demand-side factors could affect the magnitude of this reduced-form elasticity, but they do not overturn the interpretation of the sign pattern. The key fact is that euro-denominated quantities rise while euro spreads fall relative to dollar loans. This joint movement is difficult to reconcile with a pure increase in borrowers' demand for euro credit, since such a demand shift would tend to raise, not lower, the relative price of euro loans. The falling spread therefore indicates that the dominant force is a relative supply- or cost-side shift in favor of euro credit, consistent with dollar-based sanctions risk making dollar lending more costly or constrained. We therefore interpret the estimate as a reduced-form elasticity of vehicle-currency substitution induced by responses to coercive policies on global banks that are specific to U.S. dollar lending, rather than as a clean structural demand elasticity.

All in all, the evidence presented in this section is highly suggestive of substitutability of vehicle currencies being higher than what the standard treatment of network-effect inertia in international currency equilibria would suggest (Gopinath & Itskhoki, 2022).

Appendix Tables D.19, D.20 and D.21 report, respectively, fixed-effect progressions, EUR-USD specifications with full interaction terms and contract controls, and within-borrower-lender estimates; together, they show that the vehicle-currency result is not driven by fixed-effect choice, relationship composition, or basic contract characteristics.

[64] Our reduced-form elasticity captures only the substitution induced by the currency-specific friction we study - U.S. dollar settlement risk - and not the full set of channels through which sanctions could affect substitutability across financial-service providers more broadly. If instead computed with respect to the level of the financing-cost differential, $d\big(\log(1 + i^{EUR}) - \log(1 + i^{USD})\big)$, the more direct analogue to the gross price differential entering the framework of Clayton, Maggiori, and Schreger (2025b), the implied elasticity would be substantially larger, since our spread differentials, expressed as a share of one plus the interest rate, are an order of magnitude smaller than in logs of the spread itself. Such a calculation would speak to the total elasticity of substitution across vehicle currencies as financing inputs, which our reduced-form estimate, focused narrowly on the settlement-risk channel, likely understates.

Table 5: Lender-Jurisdiction and Vehicle-Currency Substitution

	Quantity				Prices	
	Level	Log	Level	Log	Level	Log
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Lender-Jurisdiction Substitution						
Post × Russia × Coalition	−1.358***	0.081	−0.457	0.139	−6.15	0.007
	(0.354)	(0.099)	(0.402)	(0.156)	(6.54)	(0.044)
Observations	87,304	27,237	15,705	15,705	15,705	15,705
Estimator	PPML	OLS	PPML	OLS	OLS	OLS
Sample	All	All	Priced Loans	Priced Loans	Priced Loans	Priced Loans
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B.1: Vehicle-Currency Substitution						
Post × Russia × EUR	2.776***	0.674*	0.690***	0.663***	−54.02***	−0.210**
	(0.455)	(0.359)	(0.191)	(0.225)	(19.01)	(0.087)
Observations	45,201	29,315	17,277	17,277	17,277	17,277
Estimator	PPML	OLS	PPML	OLS	OLS	OLS
Sample	All	All	Priced Loans	Priced Loans	Priced Loans	Priced Loans

Panel B.2: Reduced-form EUR-USD Elasticity of Substitution

Columns (4)/(6), Log-approximation: $\hat{\beta}_Q^{\log}/|\hat{\beta}_P^{\log}| \approx 3.156$

Columns (3)/(6), Finite-change Ratio: $\left[\exp(\hat{\beta}_Q^{PPML}) - 1\right] / \left[1 - \exp(\hat{\beta}_P^{\log})\right] \approx 5.252$

Notes. Coalition denotes a sanctioning-coalition lender parent. Fixed effects are borrower-year and lender-year for Panel A, and borrower-year and lender-currency-year for Panel B. Unit of observation is borrower-lender-year for Panel A and borrower-lender-currency-year for Panel B. USD is the omitted vehicle currency. *All* denotes the full estimating sample for the corresponding quantity specification. *Priced loans* denotes borrower-lender or borrower-lender-currency-year observations with observed benchmark spreads. Standard errors are clustered two-way by lender and borrower-year for Panel A, and by lender and borrower-currency-year for Panel B. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

7 A Capital Flows View of Geo-economic Power

We now further relate our findings to the emerging literature on geoeconomic power and economic coercion, connecting our detailed evidence to the macro-level debate over the sources and dynamics of global economic fragmentation. Clayton, Maggiori, and Schreger (2025b) estimate that U.S. geoeconomic power, i.e. the ability to coerce other countries by withholding access to economic resources, primarily comes from American control over the supply of financial services. China's power, conversely, relies on manufacturing. They show that, under the standard assumptions of their theoretical framework, the geo-economic power of an hegemon over a particular country (i.e. the potential loss imposed via withholding inputs) can be measured with a simple ex-ante sufficient statistic, based on the share of inputs controlled by the hegemon and the elasticity of substitution among various foreign and domestic inputs. They base their measure on trade data, and therefore relies on the WTO-OECD Balanced Trade in Services data to compute shares of controlled inputs in financial services. They show that, based on their empirical operationalisation, the American coalition geo-economic *financial* power over Russia declined very substantially, by almost 50%, following the imposition of the 2014 sectoral sanctions we study in this paper. This was a function of the non-linearity in power at the core of their modelling framework as well as a decline in the share of U.S. controlled financial inputs, again measured in the services trade data, by 10 percentage points, from a starting share of close to 95%.

In the previous Section 6 we provided suggestive evidence of higher substitutability in financial inputs - and particularly vehicle currencies - than what the off-the-shelf calibration used by Clayton, Maggiori, and Schreger (2025b) would imply. Wenow put forward in this section a capital flows view on the "share of controlled inputs": this therefore speaks to the second object - on top of an elasticity of substitution - that Clayton, Maggiori, and Schreger (2025b) use to quantify geoeconomic power in their framework. We compute a simple quantification of share of controlled capital flows informed by our empirical results in the preceding sections and relying on BIS locational statistics. Importantly, we rely on the more detailed, restricted version of the BIS locational banking dataset, which provides a breakdown of claims by both nationality (or residency) of banks and currency.

We provide a relevant empirical complement to trade-based measures, which are by definition residency based. We can compute our measurement both on a residence and nationality basis. Our approach is also able to account for both the jurisdiction and currency-specific frictions we have shown to matter for the implementation of financial sanctions.

7.1 Share of Controlled Capital Flows

Consider an hegemonic power h, exerting extra-territorial jurisdiction on the use of its currency k_h. Let $\mathrm{K}_{bit}^{(z)}$ denote the claims of bank b on agents from country i at time t in currency z. Then we define the cross-border financial inputs of country i's controlled by hegemon h at time t as:

$$\Phi_{it}^{(h)} = \underbrace{\sum_{b:\,\mathrm{J}(b)=h} \sum_{z} \mathrm{K}_{bit}^{(z)}}_{\text{Hegemon banks, All currencies}} + \underbrace{\sum_{b:\,\mathrm{J}(b)\in\mathcal{C}_h} \sum_{z} \mathrm{K}_{bit}^{(z)}}_{\text{Coalition banks, All currencies}} + \underbrace{\sum_{b:\,\mathrm{J}(b)\notin\{h\}\cup\mathcal{C}_h} \mathrm{K}_{bit}^{(z_h)}}_{\text{Hegemon currency}} . \tag{13}$$

where i is a country borrowing foreign capital, t is time, h is the hegemon country (e.g. the U.S.), z_h is the hegemon's currency (e.g. USD), $\mathcal{C}_h$ is the set of coalition countries associated with hegemon h, b indexes banks under jurisdiction $\mathrm{J}(b)$, where jurisdiction can be defined on either a residence or nationality basis, and k indexes currencies.

The cross-border financial inputs of Russia under U.S. hegemonic control $\Phi_{RUS,t}^{(U.S.)}$ on a *nationality* basis and as per the BIS locational banking statistics are depicted by the bars in panel (a) of Figure 11, while its share of controlled input counterpart $\phi_{RUS,t}^{(U.S.)}$, normalised for total cross-border claims on Russia, is shown in panel (b) of the same Figure.

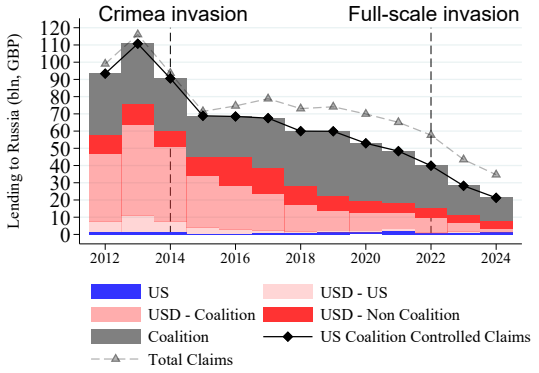
$\phi_{RUS,t}^{(U.S.)}$ was close to 100% of Russian cross-border borrowing prior to the invasion of Crimea but rapidly declined by about 26pp between 2014 and 2021, and then by a further 8pp following the full-scale invasion of Ukraine and the imposition of Western blocking financial sanctions.

The decline in the share of controlled inputs is therefore more significant in the capital flows data on a nationality-basis than in the financial services trade data used by Clayton, Maggiori, and Schreger (2025b). It is therefore of interest to compare our $\Phi_{RUS,t}^{(U.S.)}$ on a *nationality* basis to its *residence* basis counterpart. Figure E.13 in the Annex provides a residence-basis equivalent to Figure 11. Figure 12, shows the difference between the nationality and residence-basis measure of $\Phi_{RUS,t}^{(U.S.)}$. The nationality-basis $\Phi_{RUS,t}^{(U.S.)}$ is always between 4 and 8 percentage-points higher than its residence-basis counterpart. This is chiefly due to the residence-basis approach classifying claims by coalition banks booked in non-coalition residency as not being coalition controlled (the grey bars contributions). The differences in the other aggregates are inconsequential for the calculation of the controlled share as they only reflect a different residence/nationality allocation of dollar claims, which would be in any case aggregated in the third term of Equation 13. A single-digit difference in share of controlled inputs might seem small. However, that is not necessarily the case if, as in the framework developed by Clayton, Maggiori, and Schreger (2025b), geo-economic power is non-linear, and relatively small changes in the share of controlled inputs can translate into large shifts in geoeconomic power.

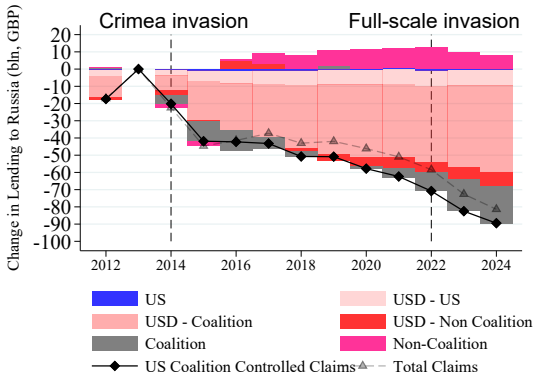
The evolution of the components of $\phi_{RUS,t}^{(U.S.)}$ are also of interest: U.S. control over Russian claims overwhelmingly came from the U.S. dollar before 2014, as it represented 70% of lending under U.S. Coalition control. However, its contribution declined drastically following the imposition of sectoral sanctions. Panels (b) and (d) in Figure 11 provide a decomposition in the change of lending to Russia and the share of controlled claims by the U.S. coalition along the key dimensions of Equation 13. As shown in Panel (b), an initial decline in the U.S. dollar share of lending by 20-25% in 2016 was initially almost completely offset by an increase in non-coalition dollar claims. As the decline driven by the dollar component reached about 40% before the 2022 full-scale invasion of Ukraine, non-coalition dollar claims also declined. The partial off-set to an overall decline in coalition controlled claims was then provided by coalition banks lending in non-USD currencies (as we know, mainly in euro).

All in all, the measurement presented in this section, which could be easily extended beyond our Russia-focused case study, highlights three relevant dimensions to the quantification of geo-economic power. First, firms respond to both nationality and residence-basis jurisdiction. As demonstrated by Coppola et al. (2021) a pure residence-basis approach can hide important patterns in global capital flows. This is therefore relevant to measuring control on financial inputs. Second, most of the U.S. control over global financial intermediation is likely to come from the use of the dollar as a vehicle currency, upon which the U.S. have been able to exercise an extra-territorial oversight via the dollar payment system. From a measurement perspective this underlines, for example, the importance of dollar invoicing in international trade when considering controlled trade inputs. Third, and finally, coalition countries seem to play a crucial role in the context we study. They first provide most of the control via U.S. dollar denominated claims, and then cushion the decline in the controlled share of financial intermediation in Russia by providing claims in non-dollar currencies.

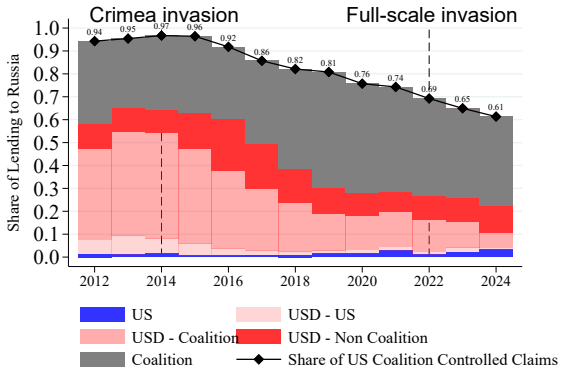
Abstracting from measurement, our analysis points to within-coalition strategic interactions and the substitutability between vehicle currencies as important future avenues of investigation on the determinants and dynamics of geo-economic power.



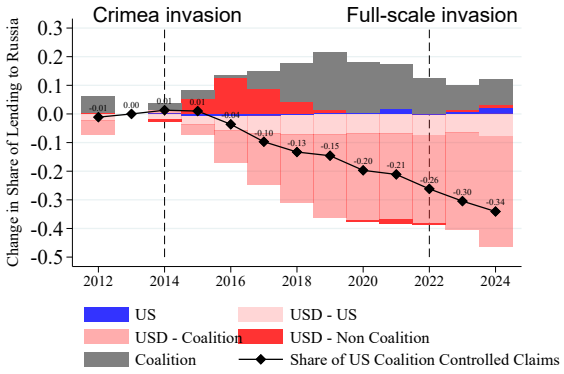
(a) Lending to Russia under U.S. Coalition Control



(b) Change in Lending to Russia



(c) Share of Lending under U.S. Coalition Control



(d) Change in the Shares of Lending to Russia

Figure 11: U.S. Coalition Controlled Claims - Nationality Basis.

Note – Amount outstanding of total cross-border claims including all counterparty sectors, all currency, all types of reporting country and all types of instruments. Lending converted from USD into GBP using quarterly averages of spot FX reported by the Bank of England. Some Other currencies start to be reported only from 2012Q2. Reporting of claims by Chinese banks starts in 2015 Q4. We match residence aggregates, and assign the difference between total lending to Russia from public BIS data and the sum of the flows plotted here by currencies to the corresponding groups of the non-coalition groups.

Source: BIS locational banking dataset.

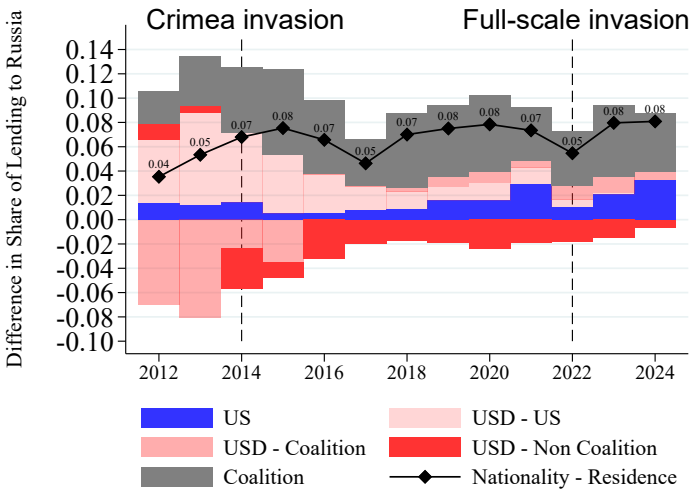


Figure 12: Difference between Nationality and Residence-basis Share of Controlled Claims.

Note – Amount outstanding of total cross-border claims including all counterparty sectors, all currency types of reporting country and all types of instruments. Lending converted from USD into GBP using quarterly averages of spot FX reported by the Bank of England. Some Other currencies start to be reported only from 2012Q2. The increase in claims from 2015Q4 in "Other" stems from the inclusion of Chinese banks in the BIS reported data. We match residence aggregates, and assign the difference between total lending to Russia from public BIS data and the sum of the flows plotted here by currencies to the corresponding groups of the non-coalition groups.

Source: BIS locational banking dataset.

8 Conclusion

In this paper, we have shown how sanction compliance risk and uncertainty over the extent of coercive actions by a hegemonic power exerting extra-territorial oversight on the use of its currency can affect the allocation of cross-border credit and the use of vehicle currencies in financial flows. We rely on the unique setting created by the 2014 Western sectoral sanctions on Russia, where the enforcement of lending restrictions on a sub-set of large Russian firms created sanction-compliance uncertainty in lending to non-sanctioned Russian firms. We document how, following the 2014 sectoral sanctions, a contraction in global lending to Russia was accompanied by a large rebalancing away from U.S.-dollar claims on Russia toward the euro, despite the formal symmetry of the sanctions and the absence of any currency-specific restrictions. Our results highlight the importance of two distinct frictions created by sanction compliance risk: jurisdiction-specific compliance risk faced by banks under the authority of sanctioning states, and currency-specific compliance and settlement risk arising from U.S. oversight over dollar payment systems.

Relying on firm-level balance sheet data we show that the rise in euro-denominated claims was driven by non-sanctioned Russian firms, ruling out sanction-avoidance motives. We then show, using bank-level data that institutions headquartered in sanctioning jurisdictions reduced their overall exposures, relative to banks headquartered elsewhere, while all banks—irrespective of ultimate-parent nationality—shifted their claims toward the euro. Loan-level evidence further demonstrates that dollar loans to Russian borrowers carried a sizeable settlement-risk premium relative to comparable euro loans, consistent with higher compliance costs. Together, these findings imply that vehicle-currency choice in international credit markets is highly sensitive to incentives embedded in the enforcement architecture of the hegemon's currency and that vehicle currencies can be higly substitutable given a strong enough shock.

We derive from our empirical findings a capital flows-based measure of hegemonic control on global financial claims that distinguishes between oversight exercised over the hegemon's own banks, oversight exercised indirectly over banks from allied jurisdictions, and oversight arising from the use of the hegemon's currency. This measure can be computed from BIS locational data broken down by currency on either a nationality or residence-basis. Applied to the Russian case, this measure shows that the decline in dollar intermediation after 2014 substantially reduced the share of claims effectively subject to U.S. coalition oversight, although this decline was partly offset by an increase in lending by coalition-banks in other currencies.

Taken together, the evidence shows that anti-coercion responses need not originate solely from third-country governments seeking to reduce dependence on the hegemon. Private financial intermediaries adjust their behaviour in ways that limit the reach of hegemonic oversight when compliance risks become salient, contributing to global economic and financial fragmentation.

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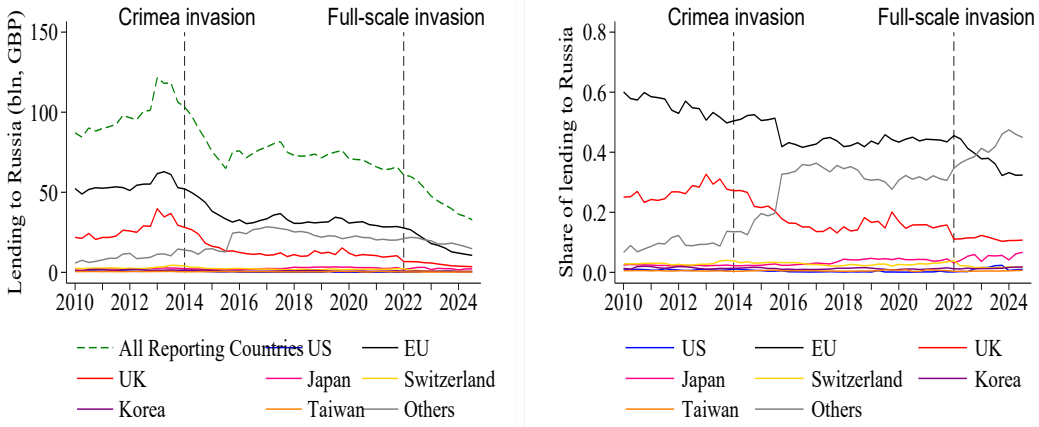
Appendix

A Additional Stylised Facts on Aggregate Capital Flows and the 2014 Sectoral Sanctions Against Russia

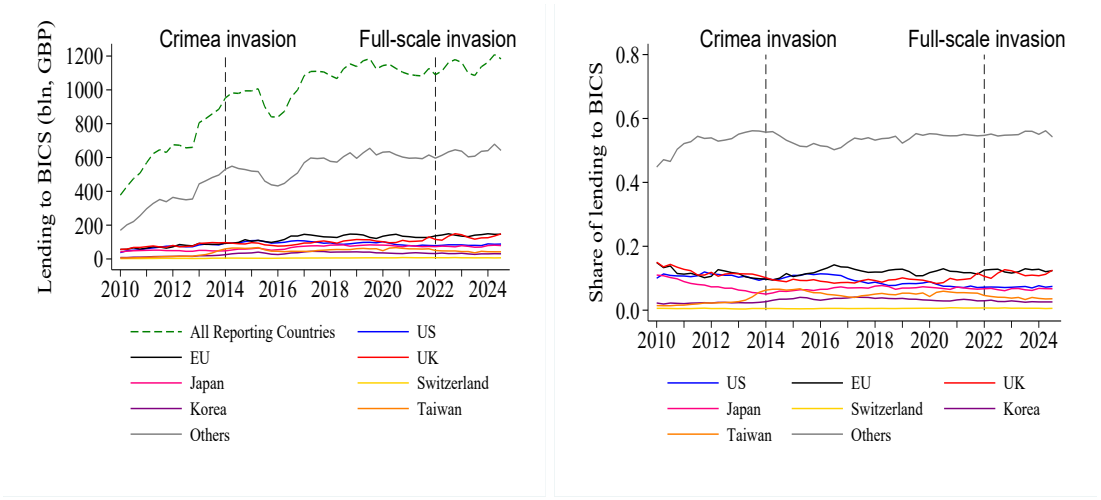


(a) Lending to Russia (b) Residence composition

Figure A.1: Global Cross-Border Claims to Russia by Residence.

Note. – Amount outstanding of total cross-border claims including all counterparty sectors, all currency types of reporting country, all types of instruments, all parent countries and all reporting institutions. Lending converted from USD into GBP using quarterly averages of spot FX reported by the Bank of England. Proportion of each currency group out of total lending to Russia is in simple shares from 0 to 1.

Source: BIS locational banking dataset.



(a) Lending to BICS (b) Currency composition

Figure A.2: Global Cross-Border Claims to BICS by Residence.

Note. – Amount outstanding of total cross-border claims including all counterparty sectors, all currency types of reporting country, all types of instruments, all parent countries and all reporting institutions. Lending converted from USD into GBP using quarterly averages of spot FX reported by the Bank of England. Proportion of each currency group out of total lending to Russia is in simple shares from 0 to 1.

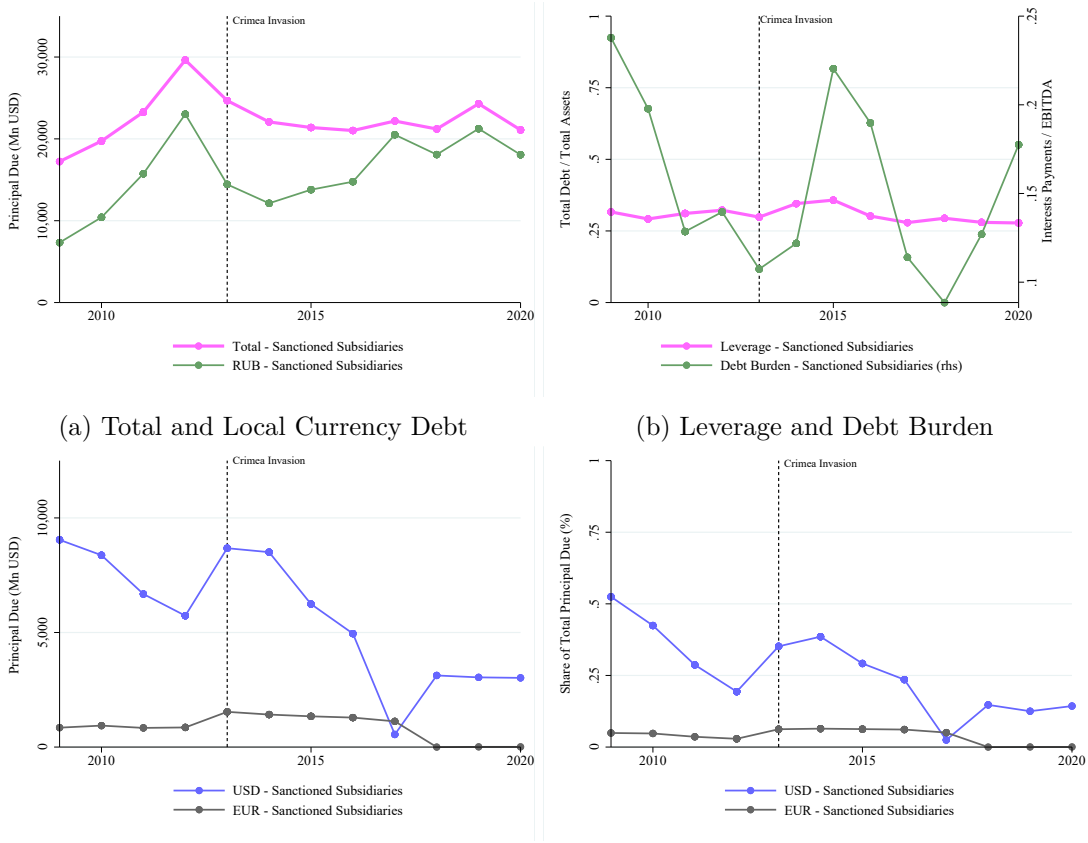
Source: BIS locational banking dataset.

Table A.1: EU-U.S. 2014 Sectoral Sanctions Lists

	United States	**European Union**
Energy		
Rosneft	✓	✓
Transneft	✓	✓
Gazprom Neft	✓	✓
Novatek	✓	×
Financial Services		
Sberbank	✓	✓
VTB	✓	✓
Gazprom Bank	✓	✓
Rosselkhozbank	✓	✓
Vnesheconombank	✓	✓
Defense		
Rostec	✓	×
UAC (Rostec Group)	–	✓
Oboronprom (Rostec Group)	–	✓
Uralvagonzavod (Rostec Group)	–	✓

The table reports the list of operating companies designated by the U.S. and EU sectoral sanctions lists in 2014, as well as subsidiaries when the operating parent is not designated itself (i.e. Gazprom Neft and, for the EU only, three Rostec's subsidiaries). Source: OFAC and European Commission.

B Appendix to the Firm-Level Empirical Analysis



(a) Total and Local Currency Debt

(b) Leverage and Debt Burden

(c) USD and EUR Principal Due

(d) Share of Principal Due in USD and EUR

Figure B.3: Debt Profile of Russian non-Operating Companies under Sectoral Sanctions.

Note. – The figure aggregates data for the non-operating companies under sectoral sanctions in our dataset, namely Gazprom Neft and several subsidiaries of defense conglomerate Rostec.

Source: Capital IQ, Authors' calculations.

Table B.2: Currency Debt Levels

	USD Debt			EUR Debt			Dom. Debt			Debt by Currency		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	−0.933***	−0.368	−0.603**	0.231	0.918***	0.741**	−0.608***	−0.148**	−0.363**			
	(0.279)	(0.238)	(0.238)	(0.250)	(0.256)	(0.363)	(0.114)	(0.073)	(0.176)			
Post × Russia × Sanctioned			−0.194			−0.528***			−0.238*			
			(0.191)			(0.178)			(0.144)			
Post × Russia × EUR										1.140***	0.980***	0.976***
										(0.357)	(0.197)	(0.198)
Post × Russia × Sanctioned × EUR												0.193
												(0.327)
Post × Russia × Domestic										0.820***	0.816***	0.808***
										(0.244)	(0.194)	(0.196)
Post × Russia × Sanctioned × Domestic												0.020
												(0.220)
Estimator	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML
Sanct. total			−0.797***			0.212			−0.601***			
SE: Sanct. total			(0.193)			(0.257)			(0.111)			
Sanct. total EUR												1.169
SE: Sanct. total EUR												(0.360)
Sanct. total Dom.												0.827
SE: Sanct. total Dom.												(0.242)
Fixed effects	Firm, sector-time			Firm, sector-time			Firm, sector-time			Firm-year, firm-curr., curr.-year		
Observations	937	1,049	1,128	373	440	509	863	964	1,043	3,066	3,304	3,557
Pseudo R-squared	0.843	0.849	0.850	0.786	0.937	0.918	0.991	0.993	0.991	0.990	0.991	0.990

Estimating sample includes firms in Russia, BRICS+ and CEEMEA emerging markets with more than 1bn USD denominated debt in 2013. Currency-specific columns are estimated at the firm-year level and cluster standard errors by country. The debt-by-currency column is estimated at the firm-year-currency level with USD as the omitted currency bucket and clusters standard errors by firm. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table B.3: Firm-Level Debt and Leverage (All Firms)

	Total Debt			Leverage		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	−0.414***	−0.414***	−0.414***	−0.068***	0.041	0.040
	(0.070)	(0.114)	(0.113)	(0.009)	(0.027)	(0.027)
Post × Russia × Sanctioned			0.012			−0.106***
			(0.076)			(0.025)
Estimator	OLS	OLS	OLS	OLS	OLS	OLS
Observations	9,831	9,946	10,023	9,835	9,950	10,027
R-squared	0.912	0.910	0.911	0.871	0.870	0.870

Estimating sample includes all firms with more than 1bn USD denominated debt in 2013. Firm and sector-time fixed effects are included in all specifications. Standard errors are clustered by country. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table B.4: Interest Expenses and Debt Burden (All Firms)

	Interest Expenses			Debt Burden		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	0.598***	−0.426**	−0.433**	0.336***	−0.397***	−0.404***
	(0.154)	(0.164)	(0.163)	(0.124)	(0.147)	(0.147)
Post × Russia × Sanctioned			1.046***			0.756***
			(0.078)			(0.100)
Estimator	OLS	OLS	OLS	OLS	OLS	OLS
Observations	8,219	8,370	8,392	7,958	8,109	8,131
R-squared	0.858	0.858	0.858	0.788	0.788	0.789

Estimating sample includes all firms with more than 1bn USD denominated debt in 2013. Firm and sector-time fixed effects are included in all specifications. Standard errors are clustered by country. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table B.5: Currency Debt Levels (All Firms / Broad Sample)

	USD Debt			EUR Debt			Dom. Debt			Debt/Curr. Excl. US/EA			Debt/Curr. Incl. US/EA		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	−0.651***	−0.640***	−0.644***	0.536	0.487	0.500	−0.184	−0.068	−0.101						
	(0.059)	(0.085)	(0.082)	(0.360)	(0.524)	(0.515)	(0.251)	(0.070)	(0.091)						
Post × Russia × Sanctioned			−0.000			0.028			−0.087						
			(0.105)			(0.198)			(0.208)						
Post × Russia × EUR										1.076***	0.951***	1.055***	0.808**	0.660***	0.768***
										(0.354)	(0.184)	(0.191)	(0.350)	(0.179)	(0.187)
Post × Russia × Sanctioned × EUR												0.113			0.136
												(0.330)			(0.330)
Post × Russia × Domestic										0.874***	0.859***	1.071***	1.012***	1.006***	1.058***
										(0.260)	(0.214)	(0.297)	(0.271)	(0.256)	(0.237)
Post × Russia × Sanctioned × Domestic												−0.026			−0.013
												(0.223)			(0.215)
Sample	Excl. US/EA			Excl. US/EA			Excl. US/EA			Excl. US/EA			Incl. US/EA		
Estimator	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML	PPML
Sanct. total			−0.644***			0.528			−0.188						
SE: Sanct. total			(0.054)			(0.354)			(0.246)						
Sanct. total EUR												1.167			0.904
SE: Sanct. total EUR												(0.352)			(0.351)
Sanct. total Dom.												1.045			1.045
SE: Sanct. total Dom.												(0.293)			(0.253)
Fixed effects	Firm, sector-time			Firm, sector-time			Firm, sector-time			Firm-year, firm-curr., curr.-year			Firm-year, firm-curr., curr.-year		
Observations	3,228	3,321	3,398	1,407	1,450	1,538	2,424	2,506	2,583	5,224	5,462	8,657	9,488	9,726	12,921
Pseudo R-squared	0.944	0.945	0.943	0.860	0.881	0.877	0.977	0.978	0.977	0.990	0.991	0.980	0.991	0.992	0.987

Estimating sample includes all firms with more than 1bn USD denominated debt in 2013, excluding US and euro-area firms in the currency-specific columns and excluding listed multilateral or supranational borrowers. Currency-specific columns are estimated at the firm-year level and cluster standard errors by country. Debt-by-currency columns are estimated at the firm-year-currency level and cluster standard errors by firm; the inclusive version keeps US and euro-area firms but classifies US USD and euro-area EUR as domestic. Sanct. total for currency-specific columns reports the sum of coefficients and corresponding lincom standard errors. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table B.6: Currency Debt Shares

	USD Share			EUR Share			Dom. Share			Share by Currency		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	−0.041	−0.046	−0.042	0.033***	0.043***	0.040***	0.004	−0.029	−0.029			
	(0.033)	(0.060)	(0.057)	(0.009)	(0.009)	(0.009)	(0.038)	(0.047)	(0.046)			
Post × Russia × Sanctioned			0.001			−0.001			0.029			
			(0.039)			(0.008)			(0.034)			
Post × Russia × EUR										0.083**	0.061	0.062
										(0.035)	(0.063)	(0.063)
Post × Russia × Sanctioned × EUR												0.021
												(0.067)
Post × Russia × Domestic										0.088	0.082	0.083
										(0.086)	(0.096)	(0.096)
Post × Russia × Sanctioned × Domestic												0.005
												(0.119)
Estimator	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Sanct. total			−0.041			0.039***			0.000			
SE: Sanct. total			(0.039)			(0.008)			(0.036)			
Sanct. total EUR												0.083**
SE: Sanct. total EUR												(0.035)
Sanct. total Dom.												0.088
SE: Sanct. total Dom.												(0.086)
Fixed effects	Firm, sector-time			Firm, sector-time			Firm, sector-time			Firm-year, firm-curr., curr.-year		
Observations	937	1,049	1,128	937	1,049	1,128	937	1,049	1,128	3,771	4,050	4,314
R-squared	0.852	0.845	0.847	0.759	0.774	0.763	0.817	0.823	0.821	0.865	0.866	0.865

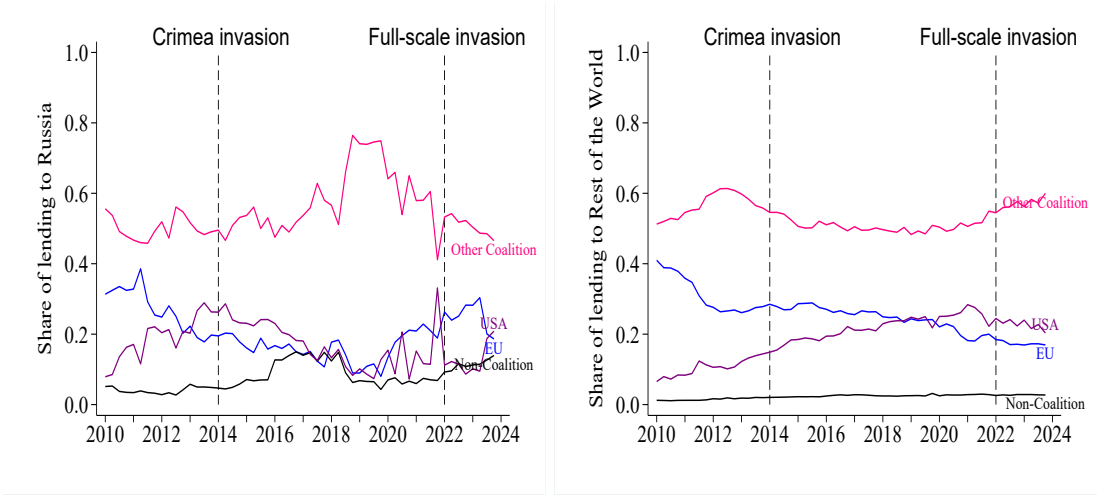
Estimating sample includes firms in Russia, BRICS+ and CEEMEA emerging markets with more than 1bn USD denominated debt in 2013. Currency-specific columns are estimated at the firm-year level and cluster standard errors by country. The share-by-currency column is estimated at the firm-year-currency level with USD as the omitted currency bucket and clusters standard errors by firm. Sanct. total EUR and Dom. report lincom sums of coefficients and corresponding standard errors. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table B.7: Currency Debt Shares (All Firms / Broad Sample)

	USD Share			EUR Share			Dom. Share			Share/Curr. Excl. US/EA			Share/Curr. Incl. US/EA		
	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD	Sanct.	Non-Sanct.	DiD
Post × Russia	−0.092	−0.090**	−0.084**	0.040***	0.039***	0.037***	0.058	0.035	0.033						
	(0.058)	(0.036)	(0.033)	(0.007)	(0.010)	(0.010)	(0.051)	(0.029)	(0.027)						
Post × Russia × Sanctioned			−0.010			0.006			0.025						
			(0.039)			(0.007)			(0.033)						
Post × Russia × EUR										0.096***	0.074	0.074	0.090***	0.069	0.069
										(0.032)	(0.061)	(0.061)	(0.030)	(0.060)	(0.060)
Post × Russia × Sanctioned × EUR												0.022			0.021
												(0.067)			(0.067)
Post × Russia × Domestic										0.131	0.126	0.126	0.141*	0.135	0.135
										(0.080)	(0.091)	(0.091)	(0.079)	(0.090)	(0.090)
Post × Russia × Sanctioned × Domestic												0.006			0.006
												(0.119)			(0.119)
Sample	Excl. US/EA			Excl. US/EA			Excl. US/EA			Excl. US/EA			Incl. US/EA		
Estimator	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Sanct. total			−0.094*			0.043***			0.058						
SE: Sanct. total			(0.048)			(0.007)			(0.043)						
Sanct. total EUR												0.096***			0.090***
SE: Sanct. total EUR												(0.032)			(0.030)
Sanct. total Dom.												0.132			0.141*
SE: Sanct. total Dom.												(0.080)			(0.079)
Fixed effects	Firm, sector-time			Firm, sector-time			Firm, sector-time			Firm-year, firm-curr., curr.-year			Firm-year, firm-curr., curr.-year		
Observations	3,238	3,331	3,408	3,238	3,331	3,408	3,238	3,331	3,408	11,562	11,841	12,105	32,493	32,772	33,036
R-squared	0.878	0.874	0.874	0.850	0.850	0.846	0.887	0.885	0.884	0.904	0.904	0.902	0.964	0.964	0.963

Estimating sample includes all firms with more than 1bn USD denominated debt in 2013, excluding US and euro-area firms in the currency-specific columns and excluding listed multilateral or supranational borrowers. Currency-specific columns are estimated at the firm-year level and cluster standard errors by country. Share-by-currency columns are estimated at the firm-year-currency level with USD as the omitted currency bucket and cluster standard errors by firm; the inclusive version keeps US and euro-area firms but classifies US USD and euro-area EUR as domestic. Sanct. total rows report the lincom sum of coefficients and corresponding standard errors. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

C Appendix to the UK Resident Bank-level Empirical Analysis

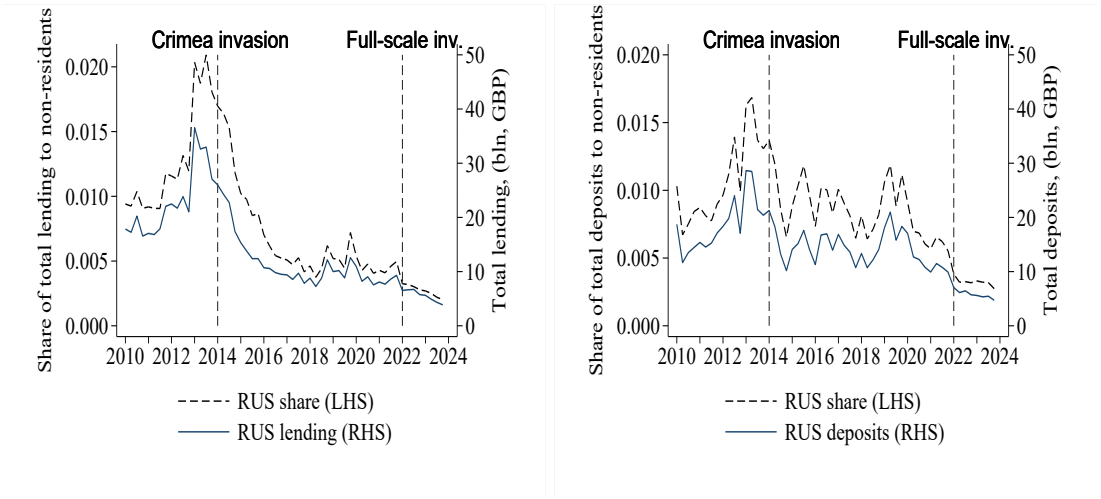


(a) Russia (b) Rest of the World

Figure C.4: Coalition composition of lending to non-residents.

Note. – Proportion of each country group out of total lending to Russia and Rest of the World is in simple shares from 0 to 1. "Other Coalition" includes AUS, CAN, CHE, GBR, ISL, JPN, NOR; "Non-Coalition" includes ARE, BHR, BRA, CHN, EGY, GHA, KOR, HKG, IDN, IND, IRN, ISR, JOR, KWT, LBY, MAR, MEX, MYS, NGA, QAT, RUS, SAU, SGP, THA, TUR, TWN, ZAF. Rest of the World includes only countries not subject to US financial sanctions as measured by the Global Sanctions Data Base (Felbermayr et al., 2020; Yalcin et al., 2025).

Source: Bank of England's dataset on claims of UK banks on non-residents.



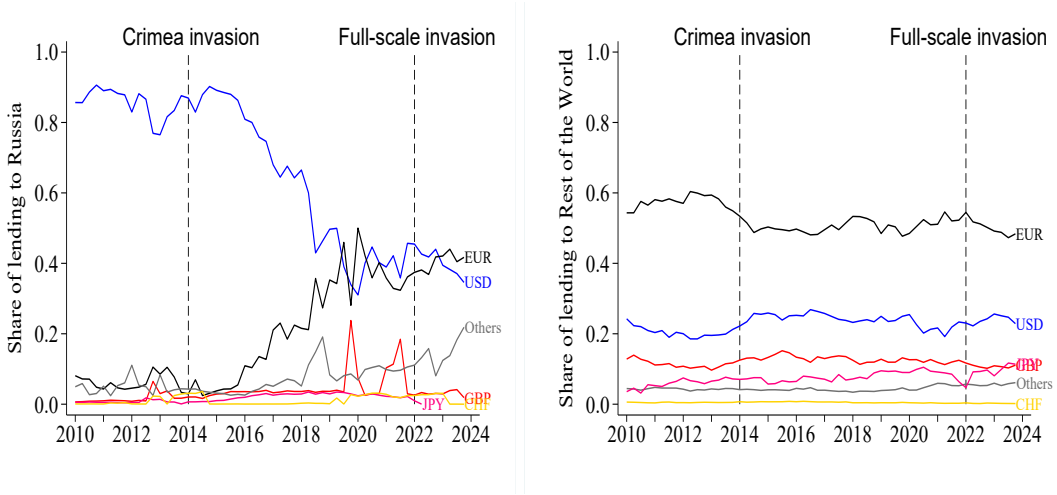
(a) Lending to Russia.

(b) Deposits from Russia.

Figure C.5: UK-resident global banks' total lending to and deposits from Russia.

Note. – Lending and deposits are in GBP Billions. Proportion of Russia lending out of total non-resident lending is in simple shares from 0 to 1.

Source: Bank of England's dataset on claims and liabilities of UK banks on non-residents.



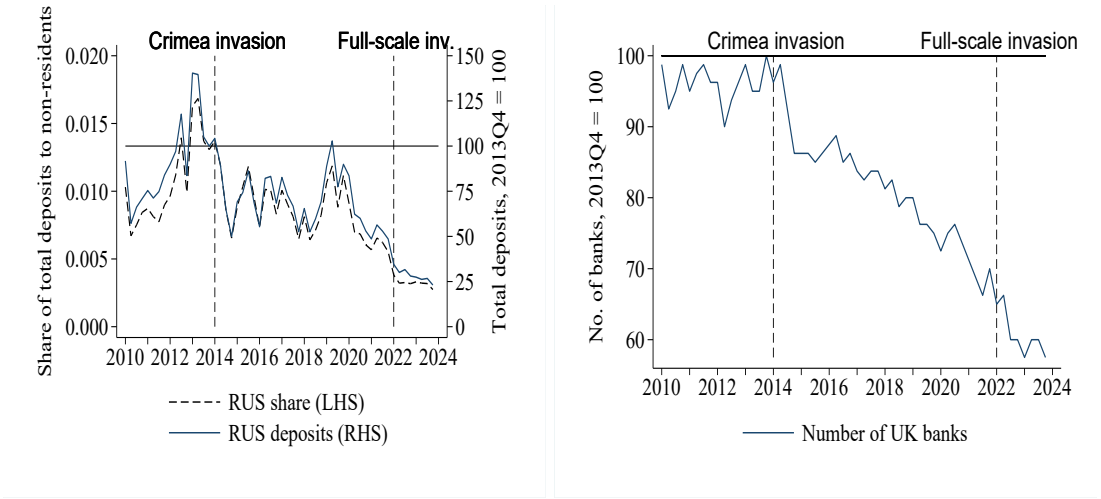
(a) Russia

(b) Rest of the World

Figure C.6: Currency composition of lending to non-residents. Lending growth winsorised to be $[-100\%, 100\%]$.

Note. – Proportion of each currency group out of total lending to Russia and Rest of the World is in simple shares from 0 to 1. Rest of the World includes only countries not subject to US financial sanctions as measured by the Global Sanctions Data Base (Felbermayr et al., 2020; Yalcin et al., 2025).

Source: Bank of England's dataset on claims of UK banks on non-residents.

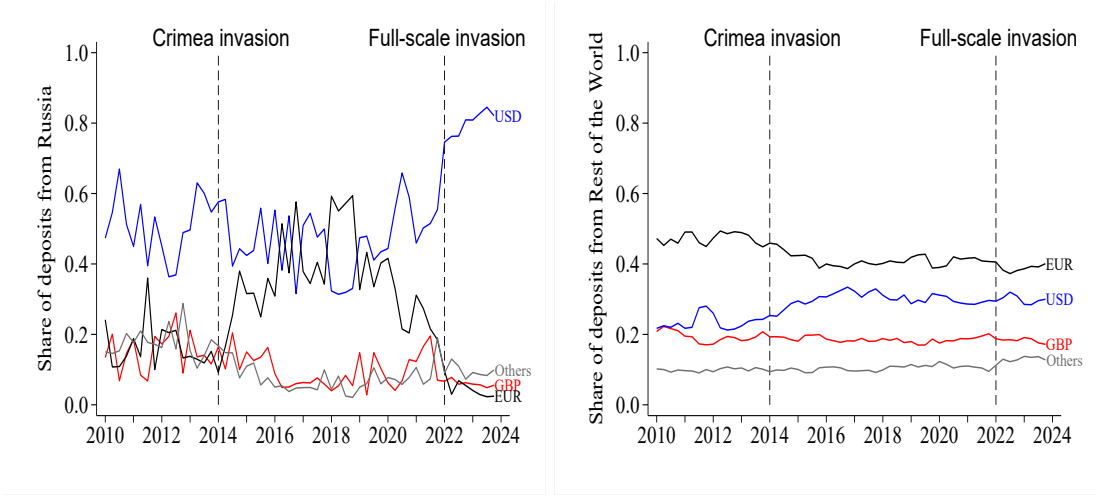


(a) Deposits from Russia. (b) Banks taking deposits from Russia.

Figure C.7: UK-resident global banks' total deposits from Russia.

Note. – Lending and number of banks are indexed to be 100 in the fourth quarter of 2013, that is the quarter before Russia's invasion of Crimea. Proportion of Russia lending out of total non-resident lending is in simple shares from 0 to 1.

Source: Bank of England's dataset on liabilities of UK banks on non-residents.

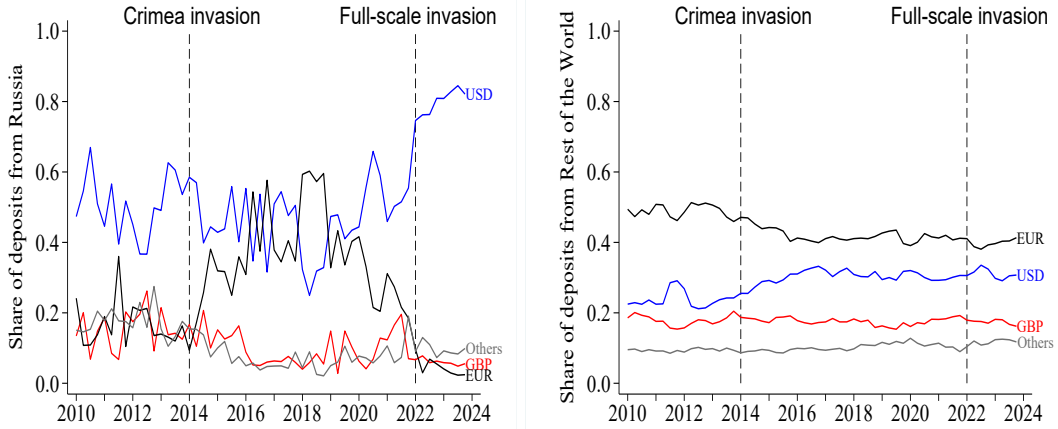


(a) Russia (b) Rest of the World

Figure C.8: Currency composition of deposits from non-residents.

Note. – Proportion of each currency group out of total lending to Russia and Rest of the World is in simple shares from 0 to 1. Rest of the World includes only countries not subject to US financial sanctions as measured by the Global Sanctions Data Base (GSDB) created by Felbermayr et al. (2020).

Source: Bank of England's dataset on liabilities of UK banks on non-residents.



(a) Russia

(b) Rest of the World

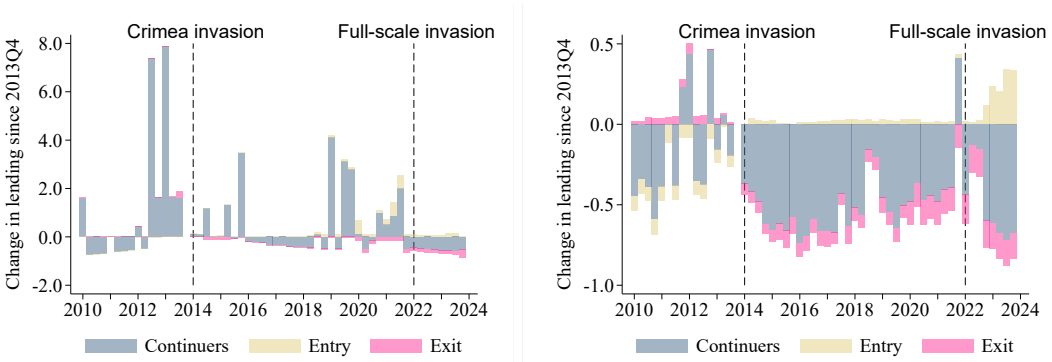
(c) BICS

(d) USA

Figure C.9: Currency composition of deposits from non-residents. (Only banks lending to Russia)

Note. – Proportion of each currency group out of total lending is in simple shares from 0 to 1. Sanctioned countries (Rest of the World) includes only countries (not) subject to US financial sanctions as measured by the Global Sanctions Data Base (GSDB) created by Felbermayr et al. (2020).

Source: Bank of England's dataset on liabilities and claims of UK banks on non-residents.

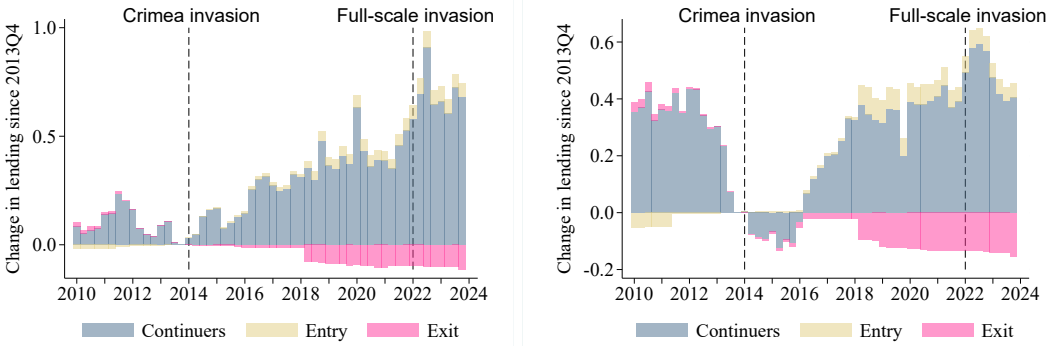


(a) GBP (b) Others

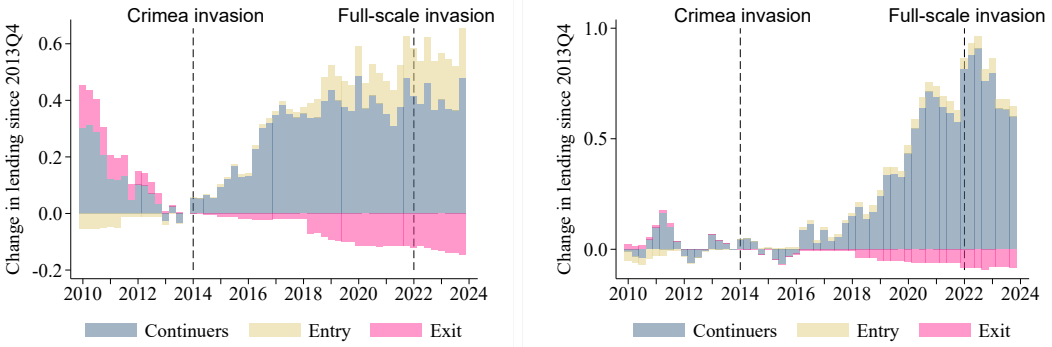
Figure C.10: Margins decomposition: Total lending to Russia in GBP and "Other" Currencies

Note. – Bars within every quarter add up to the total change in lending to Russia for that currency with respect to 2013Q4.

Source: Bank of England's dataset on claims of UK banks on non-residents.



(a) USD (b) EUR



(c) GBP (d) Others

Figure C.11: Margins decomposition: Total lending to all countries other than Russia.

Note. – Bars within every quarter add up to the total change in lending to Russia for that currency with respect to 2013Q4.

Source: Bank of England's dataset on claims of UK banks on non-residents.

Table C.8: Bank Claims on Russia after the 2014 Sectoral Sanctions: Currency-Margin Fixed-Effect Variants

	Non-USD vs. USD				EUR vs. USD			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Estimated Interaction Terms								
Coalition × Post (γ_1)	-0.584**	-0.585**		-0.584**	-0.584**	-0.585**		-0.584**
	(0.289)	(0.279)		(0.291)	(0.290)	(0.279)		(0.291)
Currency × Post (γ_2)	1.381**	1.380**	1.490**		2.014***	2.013***	1.895***	
	(0.680)	(0.689)	(0.666)		(0.642)	(0.656)	(0.610)	
Currency × Post × Coalition (γ_3)	-0.505	-0.504	-0.827	-0.505	-0.739	-0.738	-0.887	-0.739
	(0.710)	(0.718)	(0.700)	(0.719)	(0.694)	(0.706)	(0.675)	(0.709)
Panel B. Currency Margin: Claims Relative to USD								
Between: Coalition Effect, USD Claims (γ_1)	-0.584**	-0.585**		-0.584**	-0.584**	-0.585**		-0.584**
	(0.289)	(0.279)		(0.291)	(0.290)	(0.279)		(0.291)
Within Non-Coalition: Non-USD (EUR) Shift (γ_2)	1.381**	1.380**	1.490**		2.014***	2.013***	1.895***	
	(0.680)	(0.689)	(0.666)		(0.642)	(0.656)	(0.610)	
Between: Difference in Non-USD (EUR) Shift (γ_3)	-0.505	-0.504	-0.827	-0.505	-0.739	-0.738	-0.887	-0.739
	(0.710)	(0.718)	(0.700)	(0.719)	(0.694)	(0.706)	(0.675)	(0.709)
Within Coalition: Non-USD (EUR) Shift ($\gamma_2 + \gamma_3$)	0.876***	0.876***	0.663***	-0.505	1.275***	1.275***	1.008***	-0.739
	(0.277)	(0.275)	(0.228)	(0.719)	(0.349)	(0.347)	(0.299)	(0.709)
Between: Coalition Effect, Non-USD (EUR) Claims ($\gamma_1 + \gamma_3$)	-1.089	-1.089	-0.827	-1.089	-1.323	-1.323	-0.887	-1.323
	(0.850)	(0.855)	(0.700)	(0.854)	(0.823)	(0.831)	(0.675)	(0.831)
Observations	10,412	10,412	4,832	10,412	7,967	7,967	3,742	7,967
Bank-Currency FE	✓	✓	✓	✓	✓	✓	✓	✓
Quarter FE	✓				✓			
Bank-Quarter FE			✓				✓	
Currency-Quarter FE				✓				✓

Notes. The dependent variable is claims on Russia. Columns (1)–(4) compare claims denominated in all non-USD currencies to claims denominated in USD. Columns (5)–(8) keep only USD and EUR claims and compare EUR-denominated claims to USD-denominated claims. Entries are PPML log coefficients or linear combinations of PPML log coefficients. Standard errors are clustered by bank and quarter. In the row labels, "Within" denotes currency-category shifts relative to USD within the indicated bank group, while "Between" denotes coalition versus non-coalition comparisons. "Non-USD (EUR)" means non-USD in columns (1)–(4) and EUR in columns (5)–(8). USD and non-coalition banks are the omitted categories. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.9: Bank Claims on Russia after the 2014 Sectoral Sanctions: Split by Currency

	(1) EUR	(2) GBP	(3) OTH
Panel A. Estimated Interaction Terms			
Coalition × Post (γ_1)	-0.584**	-0.584**	-0.584**
	(0.289)	(0.289)	(0.289)
Currency × Post (γ_2)	2.014***	0.252	-0.827*
	(0.643)	(0.473)	(0.501)
Currency × Post × Coalition (γ_3)	-0.739	0.365	1.186**
	(0.696)	(0.607)	(0.583)
Panel B. Currency Margin: Claims Relative to USD			
Between: Coalition Effect, USD Claims (γ_1)	-0.584**	-0.584**	-0.584**
	(0.289)	(0.289)	(0.289)
Within Non-Coalition: Column-Currency Shift (γ_2)	2.014***	0.252	-0.827*
	(0.643)	(0.473)	(0.501)
Between: Difference in Column-Currency Shift (γ_3)	-0.739	0.365	1.186**
	(0.696)	(0.607)	(0.583)
Within Coalition: Column-Currency Shift ($\gamma_2 + \gamma_3$)	1.275***	0.616*	0.359
	(0.350)	(0.362)	(0.311)
Between: Coalition Effect, Column-Currency Claims ($\gamma_1 + \gamma_3$)	-1.323	-0.219	0.602
	(0.825)	(0.561)	(0.554)
Observations	13,865	13,865	13,865
Sample	Russia	Russia	Russia
Currency Definition	USD vs. EUR, GBP, OTH	USD vs. EUR, GBP, OTH	USD vs. EUR, GBP, OTH
Estimator	PPML	PPML	PPML
Bank-Currency FE	✓	✓	✓
Quarter FE	✓	✓	✓

Notes. The dependent variable is claims on Russia. This table reports currency-specific coefficients and linear combinations from the baseline Russia-sample model with USD, EUR, GBP, and OTH. The USD coalition effect, γ_1, is common across the three column-currency contrasts and is therefore reported once across columns. Entries are PPML log coefficients or linear combinations of PPML log coefficients. Standard errors are clustered by bank and quarter. In the row labels, "Within" denotes shifts in the column currency relative to USD within the indicated bank group, while "Between" denotes coalition versus non-coalition comparisons. USD and non-coalition banks are the omitted categories. CHF and JPY are not included in this split because of sparse support. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.10: Bank Claims on Russia Relative to Other Destinations after the 2014 Sectoral Sanctions: Currency-Margin Fixed-Effect Variants

	Non-USD vs. USD					EUR vs. USD				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A. Estimated Interaction Terms										
Coalition × Post × Russia ($\tilde{\gamma}_1$)	-0.326***	-0.340***	-0.329***	-0.285**	-0.340***	-0.222**	-0.340***	-0.296***	-0.251**	-0.340***
	(0.104)	(0.083)	(0.086)	(0.119)	(0.073)	(0.087)	(0.077)	(0.080)	(0.107)	(0.067)
Currency × Post × Russia ($\tilde{\gamma}_2$)	1.339***	1.082**	1.081**	1.237***	1.082**	1.790***	1.697***	1.558***	1.716***	1.697***
	(0.517)	(0.460)	(0.537)	(0.475)	(0.444)	(0.566)	(0.550)	(0.534)	(0.567)	(0.540)
Currency × Post × Coalition ($\tilde{\gamma}_3$)	-0.312	-0.478*	-0.339	-0.380	-0.478*	-0.382	-0.579	-0.503	-0.463	-0.579
	(0.380)	(0.274)	(0.305)	(0.363)	(0.274)	(0.401)	(0.396)	(0.401)	(0.408)	(0.396)
Currency × Post × Russia × Coalition ($\tilde{\gamma}_4$)	-0.491	-0.027	-0.166	-0.339	-0.026	-0.494	-0.159	-0.236	-0.324	-0.159
	(0.539)	(0.481)	(0.565)	(0.490)	(0.469)	(0.593)	(0.559)	(0.579)	(0.587)	(0.551)
Panel B. Currency Margin: Claims Relative to USD										
Between: Coalition Effect, USD Claims ($\tilde{\gamma}_1$)	-0.326***	-0.340***	-0.329***	-0.285**	-0.340***	-0.222**	-0.340***	-0.296***	-0.251**	-0.340***
	(0.104)	(0.083)	(0.086)	(0.119)	(0.073)	(0.087)	(0.077)	(0.080)	(0.107)	(0.067)
Within Non-Coalition: Non-USD (EUR) Shift ($\tilde{\gamma}_2$)	1.339***	1.082**	1.081**	1.237***	1.082**	1.790***	1.697***	1.558***	1.716***	1.697***
	(0.517)	(0.460)	(0.537)	(0.475)	(0.444)	(0.566)	(0.550)	(0.534)	(0.567)	(0.540)
Between: Difference in Non-USD (EUR) Shift ($\tilde{\gamma}_4$)	-0.491	-0.027	-0.166	-0.339	-0.026	-0.494	-0.159	-0.236	-0.324	-0.159
	(0.539)	(0.481)	(0.565)	(0.490)	(0.469)	(0.593)	(0.559)	(0.579)	(0.587)	(0.551)
Within Coalition: Non-USD (EUR) Shift ($\tilde{\gamma}_2 + \tilde{\gamma}_4$)	0.847***	1.056***	0.916***	0.898***	1.056***	1.295***	1.538***	1.322***	1.392***	1.538***
	(0.075)	(0.103)	(0.106)	(0.025)	(0.060)	(0.088)	(0.111)	(0.101)	(0.043)	(0.067)
Between: Coalition Effect, Non-USD (EUR) Claims ($\tilde{\gamma}_1 + \tilde{\gamma}_4$)	-0.818*	-0.367	-0.495	-0.624	-0.367	-0.716	-0.499	-0.532	-0.575	-0.499
	(0.464)	(0.412)	(0.495)	(0.407)	(0.400)	(0.544)	(0.513)	(0.522)	(0.542)	(0.500)
Observations	840,654	1,044,335	1,042,489	842,212	1,044,335	620,720	741,090	735,671	625,219	741,090
Bank-Destination-Currency FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Destination-Quarter FE	✓		✓			✓		✓		
Bank-Quarter FE	✓			✓		✓			✓	
Currency-Quarter FE	✓				✓	✓				✓

Notes. The dependent variable is bank claims by destination. Columns (1)–(5) compare claims denominated in all non-USD currencies to claims denominated in USD. Columns (6)–(10) keep only USD and EUR claims and compare EUR-denominated claims to USD-denominated claims. Entries are PPML log coefficients or linear combinations of PPML log coefficients. The reported effects in Panel B are Russia-specific effects relative to other destinations. Standard errors are clustered by bank, destination, and quarter. In the row labels, "Within" denotes currency-category shifts relative to USD within the indicated bank group, while "Between" denotes coalition versus non-coalition comparisons. "Non-USD (EUR)" means non-USD in columns (1)–(5) and EUR in columns (6)–(10). USD and non-coalition banks are the omitted categories. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.11: Bank Claims on Russia Relative to Other Destinations after the 2014 Sectoral Sanctions: Split by Currency

	(1) EUR	(2) GBP	(3) OTH
Panel A. Estimated Interaction Terms			
Coalition × Post × Russia ($\tilde{\gamma}_1$)	-0.243**	-0.243**	-0.243**
	(0.113)	(0.113)	(0.113)
Currency × Post × Russia ($\tilde{\gamma}_2$)	1.634**	0.381	0.298*
	(0.651)	(0.345)	(0.166)
Currency × Post × Coalition ($\tilde{\gamma}_3$)	-0.553	-0.529	0.569**
	(0.461)	(0.545)	(0.222)
Currency × Post × Russia × Coalition ($\tilde{\gamma}_4$)	-0.331	0.102	-0.078
	(0.712)	(0.357)	(0.158)
Panel B. Currency Margin: Claims Relative to USD			
Between: Coalition Effect, USD Claims ($\tilde{\gamma}_1$)	-0.243**	-0.243**	-0.243**
	(0.113)	(0.113)	(0.113)
Within Non-Coalition: Column-Currency Shift ($\tilde{\gamma}_2$)	1.634**	0.381	0.298*
	(0.651)	(0.345)	(0.166)
Between: Difference in Column-Currency Shift ($\tilde{\gamma}_4$)	-0.331	0.102	-0.078
	(0.712)	(0.357)	(0.158)
Within Coalition: Column-Currency Shift ($\tilde{\gamma}_2 + \tilde{\gamma}_4$)	1.304***	0.483***	0.220**
	(0.119)	(0.134)	(0.098)
Between: Coalition Effect, Column-Currency Claims ($\tilde{\gamma}_1 + \tilde{\gamma}_4$)	-0.573	-0.140	-0.321**
	(0.687)	(0.302)	(0.140)
Observations	1,174,646	1,174,646	1,174,646
Sample	All Destinations	All Destinations	All Destinations
Currency Sample	USD vs. EUR, GBP, OTH	USD vs. EUR, GBP, OTH	USD vs. EUR, GBP, OTH
Estimator	PPML	PPML	PPML

Notes. The dependent variable is bank claims by destination. This table reports currency-specific coefficients and linear combinations from the baseline all-destination model with USD, EUR, GBP, and OTH. Bank-Destination-Currency, Destination-Time, Bank-Time and Currency-Time fixed effects included in all specifications. Entries are PPML log coefficients or linear combinations of PPML log coefficients. The effects reported in Panel B are Russia-specific effects relative to other destinations. Standard errors are clustered by bank, destination, and quarter. In the row labels, "Within" denotes shifts in the column currency relative to USD within the indicated bank group, while "Between" denotes coalition versus non-coalition comparisons. The USD coalition effect, $\tilde{\gamma}_1$, is common across the three column-currency contrasts and is repeated for readability. USD and non-coalition banks are the omitted categories. CHF and JPY are not included in this split because of sparse support. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.12: Geopolitical Distance Quartiles for Selected Countries

Country	2000–2013	2014–2021	2022–2025
Brazil	Q2	Q2	Q2
China	Q4	Q3	Q4
Egypt	Q4	Q4	Q4
Ethiopia	Q3	Q3	Q3
India	Q3	Q2	Q2
Indonesia	Q4	Q4	Q4
Iran	Q4	Q4	Q4
Russia	Q2	Q2	Q3
South Africa	Q3	Q3	Q3
United Arab Emirates	Q4	Q4	Q4

Notes. Quartiles are based on each country's average Bailey ideal-point distance from the United States within each period, ranked against the full processed Bailey country sample for the same period. Q1 denotes the countries closest to the United States; Q4 denotes the countries farthest from the United States.

Table C.13: Spillovers to Non-Russia Destinations: Total Claims, Coalition Banks

	(1) Non-AE/EU	(2) EM	(3) BICS+	(4) BICS
Panel A. Destination Groups				
Post × Destination × Coalition	-0.097	0.036	0.360	0.257
	(0.257)	(0.239)	(0.225)	(0.202)
Observations	560,130	560,130	560,130	560,130
Pseudo R2	0.965	0.965	0.965	0.965

	(1) Q2	(2) Q3	(3) Q4
Panel B. Geopolitical-Distance Quartiles			
Post × Destination × Coalition	-0.146	-0.116	0.145
	(0.232)	(0.488)	(0.354)
Observations	478,586	478,586	478,586
Pseudo R2	0.960	0.960	0.960

Sample	Non-Russia Destinations			
Unit	Bank-Destination-Quarter			
Estimator	PPML			
Bank-Destination FE	✓	✓	✓	✓
Bank-Quarter FE	✓	✓	✓	✓
Destination-Quarter FE	✓	✓	✓	✓

Notes. The dependent variable is total bank claims to non-Russia destinations, collapsed across currencies to the bank-destination-quarter level. Panel A reports destination-group interactions. Panel B reports geopolitical-distance quartile interactions, with Q1 omitted. Entries are PPML log coefficients; standard errors are in parentheses. Standard errors are clustered by bank, destination, and quarter. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.14: Spillovers to Non-Russia Destinations: Total Claims, Russia-exposed Banks

	(1) Non-AE/EU	(2) EM	(3) BICS+	(4) BICS
Panel A. Destination Groups				
Post × Destination × Russia-exposed	0.005	0.261	0.380*	0.148
	(0.228)	(0.192)	(0.227)	(0.148)
Observations	560,130	560,130	560,130	560,130
Pseudo R2	0.965	0.965	0.965	0.965

	(1) Q2	(2) Q3	(3) Q4	
Panel B. Geopolitical-Distance Quartiles				
Post × Destination × Russia-exposed	0.219	0.356	0.500	
	(0.166)	(0.250)	(0.311)	
Observations	478,586	478,586	478,586	
Pseudo R2	0.960	0.960	0.960	

Sample	Non-Russia Destinations			
Unit	Bank-Destination-Quarter			
Estimator	PPML			
Bank-Destination FE	✓	✓	✓	✓
Bank-Quarter FE	✓	✓	✓	✓
Destination-Quarter FE	✓	✓	✓	✓

Notes. The dependent variable is total bank claims to non-Russia destinations, collapsed across currencies to the bank-destination-quarter level. Panel A reports destination-group interactions. Panel B reports geopolitical-distance quartile interactions, with Q1 omitted. Entries are PPML log coefficients; standard errors are in parentheses. Standard errors are clustered by bank, destination, and quarter. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.15: Spillovers to Non-Russia Destinations: Total Claims, Coalition × Russia-exposed Banks

	(1) Non-AE/EU	(2) EM	(3) BICS+	(4) BICS
Panel A. Destination Groups				
Post × Destination × Coalition × Russia-exposed	-0.098	0.098	0.351*	0.271
	(0.192)	(0.192)	(0.195)	(0.184)
Observations	560,130	560,130	560,130	560,130
Pseudo R2	0.965	0.965	0.965	0.965

	(1) Q2	(2) Q3	(3) Q4	
Panel B. Geopolitical-Distance Quartiles				
Post × Destination × Coalition × Russia-exposed	0.100	-0.010	0.287	
	(0.153)	(0.404)	(0.255)	
Observations	478,586	478,586	478,586	
Pseudo R2	0.960	0.960	0.960	

Sample	Non-Russia Destinations			
Unit	Bank-Destination-Quarter			
Estimator	PPML			
Bank-Destination FE	✓	✓	✓	✓
Bank-Quarter FE	✓	✓	✓	✓
Destination-Quarter FE	✓	✓	✓	✓

Notes. The dependent variable is total bank claims to non-Russia destinations, collapsed across currencies to the bank-destination-quarter level. Panel A reports destination-group interactions. Panel B reports geopolitical-distance quartile interactions, with Q1 omitted. Entries are PPML log coefficients; standard errors are in parentheses. Standard errors are clustered by bank, destination, and quarter. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.16: Spillovers to Non-Russia Destinations: Currency Margin, Coalition Banks

	Destination Groups				US-Distance Quartiles		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Non-AE/EU	EM	BICS+	BICS	Q2	Q3	Q4
Panel A. Estimated Interaction Terms							
BankGroup × Post × Destination (γ_1^S)	-0.374**	-0.216	-0.099	-0.154	-0.584**	-0.676	-0.441*
	(0.186)	(0.200)	(0.174)	(0.217)	(0.235)	(0.453)	(0.252)
EUR × Post × Destination (γ_2^S)	0.722	0.818	-0.170	0.101	-0.438	-0.432	1.455
	(0.793)	(0.841)	(0.535)	(0.511)	(0.459)	(0.454)	(1.009)
EUR × Post × Destination × BankGroup (γ_3^S)	-0.277	-0.445	0.769	0.674	0.819*	0.835	-0.799
	(0.770)	(0.772)	(0.494)	(0.522)	(0.489)	(0.703)	(0.924)
Panel B. Currency Margin: Claims Relative to USD							
Between: BankGroup Effect, USD Claims (γ_1^S)	-0.374**	-0.216	-0.099	-0.154	-0.584**	-0.676	-0.441*
	(0.186)	(0.200)	(0.174)	(0.217)	(0.235)	(0.453)	(0.252)
Within Other Banks: EUR Shift (γ_2^S)	0.722	0.818	-0.170	0.101	-0.438	-0.432	1.455
	(0.793)	(0.841)	(0.535)	(0.511)	(0.459)	(0.454)	(1.009)
Between: Difference in EUR Shift (γ_3^S)	-0.277	-0.445	0.769	0.674	0.819*	0.835	-0.799
	(0.770)	(0.772)	(0.494)	(0.522)	(0.489)	(0.703)	(0.924)
Within BankGroup: EUR Shift ($\gamma_2^S + \gamma_3^S$)	0.445***	0.373*	0.599**	0.775**	0.381**	0.403	0.656*
	(0.153)	(0.210)	(0.285)	(0.372)	(0.159)	(0.428)	(0.353)
Between: BankGroup Effect, EUR Claims ($\gamma_1^S + \gamma_3^S$)	-0.650	-0.661	0.671	0.519	0.235	0.159	-1.239
	(0.760)	(0.771)	(0.552)	(0.579)	(0.395)	(0.624)	(0.866)
Observations	610,465	610,465	610,465	610,465	519,426	519,426	519,426
Pseudo R2	0.949	0.949	0.949	0.949	0.938	0.938	0.938
Sample	Non-Russia Destinations, EUR vs. USD.						
Bank-Destination-Currency FE	✓	✓	✓	✓	✓	✓	✓
Bank-Quarter FE	✓	✓	✓	✓	✓	✓	✓
Destination-Quarter FE	✓	✓	✓	✓	✓	✓	✓
Currency-Quarter FE	✓	✓	✓	✓	✓	✓	✓

Notes. The dependent variable is bank claims to non-Russia destinations. The table keeps USD and EUR claims and reports spillover currency-margin estimates for BankGroup defined as Coalition. Columns (1)-(4) report destination-group interactions. Columns (5)-(7) report geopolitical-distance quartile interactions, with Q1 omitted. Entries are PPML log coefficients or linear combinations of PPML log coefficients. Standard errors are clustered by bank, destination, and quarter. In the row labels, Within denotes EUR shifts relative to USD within the indicated bank group, while Between denotes comparisons between BankGroup and other banks. Other Banks denotes non-coalition banks. USD and banks outside BankGroup are the omitted categories. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.17: Spillovers to Non-Russia Destinations: Currency Margin, Russia-exposed Banks

	Destination Groups				US-Distance Quartiles		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Non-AE/EU	EM	BICS+	BICS	Q2	Q3	Q4
Panel A. Estimated Interaction Terms							
BankGroup × Post × Destination (γ_1^S)	-0.099	0.331	0.109	-0.004	-0.055	0.173	0.388
	(0.292)	(0.212)	(0.174)	(0.185)	(0.259)	(0.277)	(0.315)
EUR × Post × Destination (γ_2^S)	0.527	0.987	-0.290	-0.195	-0.363	-0.315	1.621*
	(0.562)	(0.626)	(0.182)	(0.294)	(0.280)	(0.321)	(0.849)
EUR × Post × Destination × BankGroup (γ_3^S)	-0.042	-0.626	0.979***	1.045**	0.805***	0.745	-0.921
	(0.542)	(0.548)	(0.305)	(0.409)	(0.278)	(0.525)	(0.778)
Panel B. Currency Margin: Claims Relative to USD							
Between: BankGroup Effect, USD Claims (γ_1^S)	-0.099	0.331	0.109	-0.004	-0.055	0.173	0.388
	(0.292)	(0.212)	(0.174)	(0.185)	(0.259)	(0.277)	(0.315)
Within Other Banks: EUR Shift (γ_2^S)	0.527	0.987	-0.290	-0.195	-0.363	-0.315	1.621*
	(0.562)	(0.626)	(0.182)	(0.294)	(0.280)	(0.321)	(0.849)
Between: Difference in EUR Shift (γ_3^S)	-0.042	-0.626	0.979***	1.045**	0.805***	0.745	-0.921
	(0.542)	(0.548)	(0.305)	(0.409)	(0.278)	(0.525)	(0.778)
Within BankGroup: EUR Shift ($\gamma_2^S + \gamma_3^S$)	0.484***	0.360	0.690**	0.850**	0.442***	0.430	0.700*
	(0.168)	(0.225)	(0.289)	(0.347)	(0.160)	(0.367)	(0.381)
Between: BankGroup Effect, EUR Claims ($\gamma_1^S + \gamma_3^S$)	-0.141	-0.295	1.089***	1.041**	0.751***	0.918*	-0.533
	(0.478)	(0.541)	(0.404)	(0.529)	(0.290)	(0.468)	(0.826)
Observations	610,465	610,465	610,465	610,465	519,426	519,426	519,426
Pseudo R2	0.949	0.949	0.949	0.949	0.938	0.938	0.938
Sample	Non-Russia Destinations, EUR vs. USD.						
Bank-Destination-Currency FE	✓	✓	✓	✓	✓	✓	✓
Bank-Quarter FE	✓	✓	✓	✓	✓	✓	✓
Destination-Quarter FE	✓	✓	✓	✓	✓	✓	✓
Currency-Quarter FE	✓	✓	✓	✓	✓	✓	✓

Notes. The dependent variable is bank claims to non-Russia destinations. The table keeps USD and EUR claims and reports spillover currency-margin estimates for BankGroup defined as Russia-exposed. Columns (1)-(4) report destination-group interactions. Columns (5)-(7) report geopolitical-distance quartile interactions, with Q1 omitted. Entries are PPML log coefficients or linear combinations of PPML log coefficients. Standard errors are clustered by bank, destination, and quarter. In the row labels, Within denotes EUR shifts relative to USD within the indicated bank group, while Between denotes comparisons between BankGroup and other banks. Other Banks denotes banks without positive Russia claims in 2013Q4. USD and banks outside BankGroup are the omitted categories. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table C.18: Spillovers to Non-Russia Destinations: Currency Margin, Coalition × Russia-exposed Banks

	Destination Groups				US-Distance Quartiles		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Non-AE/EU	EM	BICS+	BICS	Q2	Q3	Q4
Panel A. Estimated Interaction Terms							
BankGroup × Post × Destination (γ_1^S)	-0.299	-0.029	-0.012	-0.080	-0.221	-0.454	-0.024
	(0.232)	(0.220)	(0.175)	(0.204)	(0.230)	(0.444)	(0.296)
EUR × Post × Destination (γ_2^S)	0.297	0.601	-0.107	0.074	-0.357	-0.513*	1.297
	(0.509)	(0.615)	(0.246)	(0.303)	(0.291)	(0.309)	(0.846)
EUR × Post × Destination × BankGroup (γ_3^S)	0.226	-0.184	0.802***	0.794***	0.842***	1.087**	-0.557
	(0.482)	(0.525)	(0.170)	(0.233)	(0.310)	(0.502)	(0.751)
Panel B. Currency Margin: Claims Relative to USD							
Between: BankGroup Effect, USD Claims (γ_1^S)	-0.299	-0.029	-0.012	-0.080	-0.221	-0.454	-0.024
	(0.232)	(0.220)	(0.175)	(0.204)	(0.230)	(0.444)	(0.296)
Within Other Banks: EUR Shift (γ_2^S)	0.297	0.601	-0.107	0.074	-0.357	-0.513*	1.297
	(0.509)	(0.615)	(0.246)	(0.303)	(0.291)	(0.309)	(0.846)
Between: Difference in EUR Shift (γ_3^S)	0.226	-0.184	0.802***	0.794***	0.842***	1.087**	-0.557
	(0.482)	(0.525)	(0.170)	(0.233)	(0.310)	(0.502)	(0.751)
Within BankGroup: EUR Shift ($\gamma_2^S + \gamma_3^S$)	0.523***	0.416*	0.695**	0.868**	0.485***	0.574	0.740*
	(0.170)	(0.226)	(0.281)	(0.348)	(0.173)	(0.428)	(0.378)
Between: BankGroup Effect, EUR Claims ($\gamma_1^S + \gamma_3^S$)	-0.073	-0.213	0.790***	0.714**	0.622**	0.634**	-0.581
	(0.427)	(0.494)	(0.266)	(0.279)	(0.276)	(0.249)	(0.738)
Observations	610,465	610,465	610,465	610,465	519,426	519,426	519,426
Pseudo R2	0.949	0.949	0.949	0.949	0.938	0.938	0.938
Sample	Non-Russia Destinations, EUR vs. USD.						
Bank-Destination-Currency FE	✓	✓	✓	✓	✓	✓	✓
Bank-Quarter FE	✓	✓	✓	✓	✓	✓	✓
Destination-Quarter FE	✓	✓	✓	✓	✓	✓	✓
Currency-Quarter FE	✓	✓	✓	✓	✓	✓	✓

Notes. The dependent variable is bank claims to non-Russia destinations. The table keeps USD and EUR claims and reports spillover currency-margin estimates for BankGroup defined as Coalition × Russia-exposed. Columns (1)-(4) report destination-group interactions. Columns (5)-(7) report geopolitical-distance quartile interactions, with Q1 omitted. Entries are PPML log coefficients or linear combinations of PPML log coefficients. Standard errors are clustered by bank, destination, and quarter. In the row labels, Within denotes EUR shifts relative to USD within the indicated bank group, while Between denotes comparisons between BankGroup and other banks. Other Banks denotes banks that are not both coalition and Russia-exposed. USD and banks outside BankGroup are the omitted categories. All specifications include the fixed effects reported at the bottom of the table. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

D Appendix to the Syndicated Loan Empirical Analysis

D.1 Stylised Facts

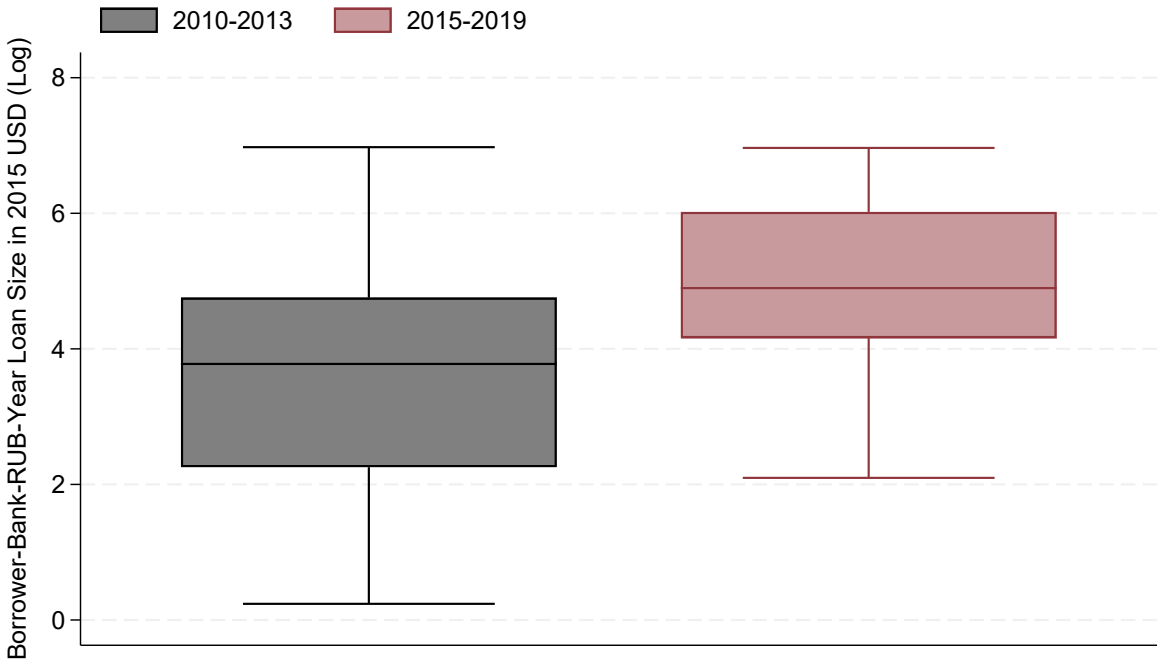


Figure D.12: Russian Syndicated Loans Size Spread In Ruble Before and After 2014.

Note. – Averaged loan size for bank-borrower-currency-year observations on the universe of Russian syndicated loans. Loan size is computed from the US dollar converted tranche amount deflated to 2015 US prices.

Source: DealScan and authors' calculations.

D.2 Additional Empirical Evidence

Table D.19: Fixed-Effects Progression for Lender-Jurisdiction and Vehicle-Currency Substitution

	(1) Borrower-Year + Lender	(2) Borrower + Lender-Time	(3) Baseline
Panel A: Lender-Jurisdiction Substitution			
Level Quantity	−0.667*	−1.605**	−1.358***
	(0.401)	(0.646)	(0.354)
Observations	103,897	336,634	87,304
Log Quantity, USD/EUR	0.123	0.308***	0.081
	(0.102)	(0.114)	(0.099)
Observations	30,211	27,495	27,237
Log Spread, Priced Loans	−0.007	−0.091	0.007
	(0.019)	(0.061)	(0.044)
Observations	17,619	15,772	15,705
Panel B: Vehicle-Currency Substitution			
Level Quantity	2.644***	2.906***	2.776***
	(0.460)	(0.446)	(0.455)
Observations	63,916	45,306	45,201
Log Quantity	0.686**	0.773**	0.674*
	(0.342)	(0.301)	(0.359)
Observations	33,286	29,586	29,315
Log Quantity, Priced Loans	0.524**	1.347***	0.663***
	(0.267)	(0.331)	(0.225)
Observations	19,917	17,348	17,277
Log Spread, Priced Loans	−0.143**	−0.656**	−0.210**
	(0.066)	(0.270)	(0.087)
Observations	19,917	17,348	17,277

Notes. The table reports the coefficient of interest across alternative fixed-effect structures. Panel A reports the coefficient on Post × Russia × Coalition. Panel B reports the coefficient on Post × Russia × EUR. Column (3) is the baseline specification used in the main table. In Panel A, column (1) includes borrower-year and lender fixed effects, column (2) includes borrower and lender-year fixed effects, and column (3) includes borrower-year and lender-year fixed effects. In Panel B, column (1) includes borrower-year, lender, and currency fixed effects, column (2) includes borrower and lender-currency-year fixed effects, and column (3) includes borrower-year and lender-currency-year fixed effects. Level quantity specifications are estimated by PPML. Log quantity and log spread specifications are estimated by OLS. *Priced Loans* denotes observations with reported benchmark spreads. The sample excludes 2014. Standard errors are clustered two-way by lender and borrower-year in Panel A, and by lender and borrower-currency-year in Panel B. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

Table D.20: Vehicle-Currency Substitution: Full Coefficients and Contract Controls

	Quantity		Prices		
	Level	Level	Log	Log	Log
	(1)	(2)	(3)	(4)	(5)
Russia × EUR	−0.985***	−0.912***	0.087**	0.076*	0.083*
	(0.169)	(0.183)	(0.042)	(0.044)	(0.044)
Post × Russia × EUR	0.690***	0.621***	−0.210**	−0.210**	−0.214**
	(0.191)	(0.205)	(0.087)	(0.084)	(0.084)
Log Maturity		−0.611***		0.308***	0.309***
		(0.175)		(0.047)	(0.047)
Log Loan Amount					0.007
					(0.006)
Observations	17,277	17,188	17,277	17,188	17,188
Russian Post Observations	171	171	171	171	171
Estimator	PPML	PPML	OLS	OLS	OLS
Sample	Priced Loans	Priced Loans	Priced Loans	Priced Loans	Priced Loans
Controls	None	Maturity	None	Maturity	Maturity + Loan Amount

Notes. The table reports the EUR-USD vehicle-currency specification on observations with reported benchmark spreads. The unit of observation is a borrower-lender-currency-year, and the sample excludes 2014. USD is the omitted currency. All columns include borrower-year and lender-currency-year fixed effects. Columns (1) and (2) estimate level loan quantities by PPML. Columns (3)–(5) estimate log benchmark spreads by OLS. Log Loan Amount is included only in price regressions, not in quantity regressions, because it is mechanically related to the quantity outcome. Standard errors are clustered two-way by lender and borrower-currency-year. Significance: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

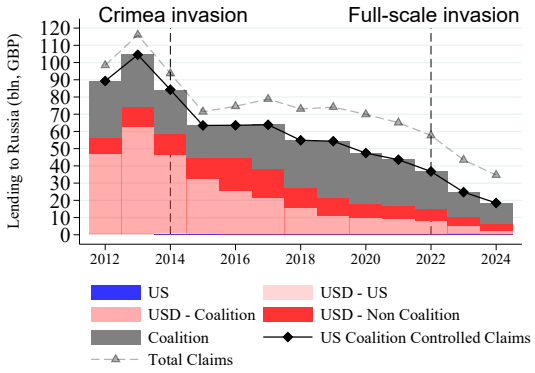
Table D.21: Lender-Jurisdiction and Vehicle-Currency Substitution: Within Borrower-Lender

	Quantity				Prices	
	Level	Log	Level	Log	Level	Log
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Lender-Jurisdiction Substitution						
Post × Russia × Coalition	−1.567***	0.671***	0.500***	0.501†	−14.39†	−0.082***
	(0.586)	(0.113)	(0.182)			(0.027)
Observations	55,448	6,712	4,157	4,157	4,157	4,157
Estimator	PPML	OLS	PPML	OLS	OLS	OLS
Sample	All	All	Priced Loans	Priced Loans	Priced Loans	Priced Loans
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: Vehicle-Currency Substitution						
Post × Russia × EUR	2.958***	0.986**	0.771**	0.766**	−42.62***	−0.169***
	(0.512)	(0.418)	(0.332)	(0.321)	(13.33)	(0.064)
Observations	36,248	9,989	6,455	6,455	6,455	6,455
Estimator	PPML	OLS	PPML	OLS	OLS	OLS
Sample	All	All	Priced Loans	Priced Loans	Priced Loans	Priced Loans

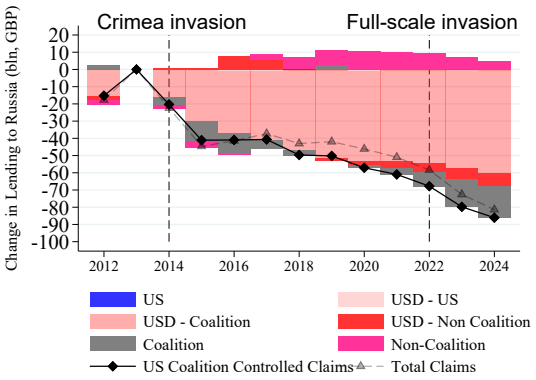
Notes. Coalition identifies lenders whose ultimate parent is headquartered in a sanctioning-coalition country. This table repeats the baseline specifications after adding borrower-lender fixed effects, so the estimates compare changes within the same borrower-lender relationship over time. It should therefore be read as a within-relationship robustness check, not as the preferred baseline specification. The unit of observation is a borrower-lender-year in Panel A and a borrower-lender-currency-year in Panel B. The sample excludes 2014. USD is the omitted currency. *All* denotes the main quantity sample for the corresponding specification; *Priced Loans* denotes observations with reported benchmark spreads. Blank cells indicate that the corresponding regression is not estimated in that panel. Standard errors are clustered two-way by lender and borrower-year in Panel A, and by lender and borrower-currency-year in Panel B.

† In Panel A, the within borrower-lender estimates in columns (4) and (5) do not have reported standard errors because the clustered variance matrix is singular. The point estimates are shown without standard errors or significance stars.

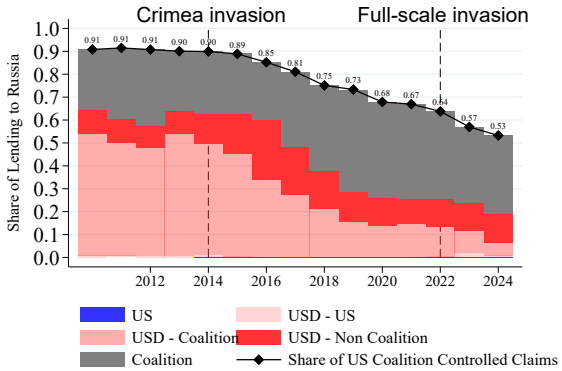
E Appendix to the Capital Flows View of Geo-economic Power



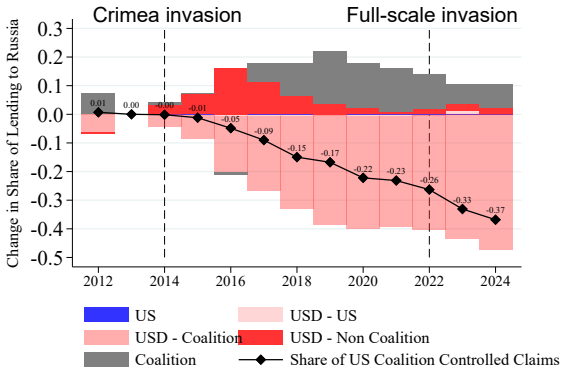
(a) Lending to Russia under U.S. Coalition Control



(b) Change in Lending to Russia



(c) Share of Lending under U.S. Coalition Control



(d) Change in the Shares of Lending to Russia

Figure E.13: U.S. Coalition Controlled Claims - Residence Basis.

Note – Amount outstanding of total cross-border claims including all counterparty sectors, all currency, all types of reporting country and all types of instruments. Lending converted from USD into GBP using quarterly averages of spot FX reported by the Bank of England. Some "Other" currencies start to be reported only from 2012Q2. Reporting of claims by Chinese banks starts in 2015 Q4. We match residence aggregates, and assign the difference between total lending to Russia from public BIS data and the sum of the flows plotted here by currencies to the corresponding groups of the non-coalition groups.

Source: BIS locational banking dataset.