Sanctions and Currencies in Global Credit

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Abstract

This paper studies how sanction-compliance risk affects the allocation of cross-border credit, the dominance of the U.S. dollar in global credit markets and, ultimately, the oversight of hegemonic powers on global financial intermediation. We focus on a unique setting, where, following the 2014 invasion of Crimea, targeted financial sanctions coordinated by the U.S. and the EU restricted Western banks from providing new financing to a subset of strategic Russian firms. Crucially, access to cross-border lending for the vast majority of Russian firms continued until the full-scale invasion of Ukraine in 2022. We first document how, between 2014 and 2021, the share of global cross-border claims on Russia denominated in U.S. dollars fell from about 65 percent to 25 percent, while the share in euros rose from roughly 20 percent to 45 percent. We then show empirically that financial sanctions generate two distinct types of frictions—jurisdictional and currency-specific. The latter stems from the U.S. extra-territorial oversight on transactions settled via the dollar payment system. Our analysis proceeds in three steps. First, we show how the rise in euro-denominated claims was driven entirely by non-sanctioned Russian firms. Second, we rely on a confidential bank-level dataset, covering the universe of cross-border claims of banks resident in the United Kingdom, to disentangle jurisdictional and currency frictions. Banks whose ultimate parent was headquartered in a sanctioning jurisdiction reduced their claims on Russia by 20–40 percent relative to other banks. However, all banks—regardless of their ultimate jurisdiction—increased Russian claims in euros relative to dollars, by a factor of about four. Moreover, we show that sanctioning coalition banks directly exposed to Russia's sectoral sanctions subsequently reduced their claims on other emerging markets along the same dimensions, relative to non-exposed banks. Third, we analyse prices and quantities in the Russian syndicated-loan market after 2014. We find strong evidence of a settlement-risk premium on U.S. dollar loans to Russian borrowers, relative to the euro, worth abouth 50bps. Together with a large positive response of loan volumes in euro, relative to dollars, this is indicative of high substitutability between vehicle currencies. Our results have broader implications for the debate on the dynamics of geoeconomic power. Using BIS locational banking data by nationality and currency, we provide a new capital-flows perspective on measuring the share of financial inputs controlled by a hegemon, informed by our empirical evidence. We show that U.S. control on Russian cross-border claims before 2014 was mostly driven by use of the U.S. dollar by non-U.S. banks and that it declined from 97% in 2013 to 74% in 2021, with a partial off-set driven by increased non-dollar lending by coalition banks. All in all, our results highlight how private firms' responses to coercive actions can contribute to global financial fragmentation.

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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 geonomic 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 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.

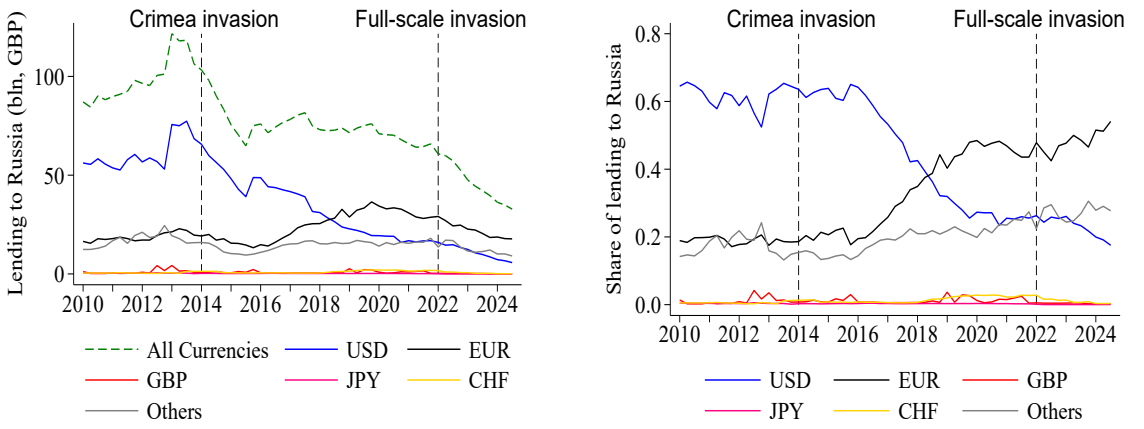
On the one hand, banks headquartered in sanctioning jurisdictions face higher expected compliance costs when transacting with firms or jurisdictions already subject to partial sanctions, where uncertainty about the ultimate beneficiary or future sanction status is material. They therefore reduce exposures

[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.

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. 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. 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 euro-isation 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 claims on Russia by between 20% and 40%, relative to banks ultimately based in a non-sanctioning jurisdiction and across all currencies. However, all banks, regardless of their ultimate-parent's nationality, increased their Russian claims in euro relative to their claims in dollars by a factor of four to six, depending on the specification. Furthermore, we provide evidence of de-risking spillovers driven by banks exposed

to Russian sectoral sanctions. We show that sanctioning coalition banks that were exposed to Russian claims the quarter before the invasion of Crimea de-risked from non-Russia emerging-markets along the same dimensions we document in Russian claims, reducing overall claims and denominating more of those claims in euro relative to U.S. dollars.

Third, we assess how prices and quantities of syndicated loans to Russian non-sanctioned firms reacted to these same jurisdiction and currency frictions. 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, banks that lend in both currencies price dollar loans about 50 bps higher than comparable euro loans, equivalent to a 23 percent decline in relative euro–dollar pricing. Together with an increase in syndicated lending volumes in euro, relative to dollars, of about 75% in our most conservative estimate, this is indicative of high substitutability between vehicle currencies in global credit markets. Looking at jurisdiction-specific frictions, 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 geoconomic 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 financial 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 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. Additionnally, 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.

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; De Haas et al., 2025; Eichengreen et al., 2019; Goldberg & Hannaoui, 2024; Koosakul et al., 2024; McDowell, 2023; Niepmann & Shen, 2025; Pflueger & Yared, 2024; 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).

[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.

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 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.

[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.

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]. 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.

[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*.

[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.

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 in non-sanctioning jurisdictions, across all currencies 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

[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.

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 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.

[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.

[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.

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 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 before 2022

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

[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.

[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.

Russian borrowers (Fadian, 2015). These clauses, while keeping 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, the euro denomination of global banking claims on Russia should increase, relative to U.S. dollar denomination, across 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 the EU opposition to extra-territorial jurisdiction. This asymmetry generates, in jurisdictions with high sanction compliance risk, 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.

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; 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' 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]

[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

[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).

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 LoanConnector 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 includes 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,

[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.

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]

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.

[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 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 for 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.

A key purpose of this section is to rule out that euro lending flowed to *sanctioned* Russian firms, i.e. that euro-isation had anything to do with sanction avoidance practices. This helps clarify the interpretation for the patterns we observe in our other granular datasets.

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 now present some stylised facts on the overall profile and currency composition of Russian firms' debt, comparing firms under EU-U.S. sectoral sanctions with a sample of firms that were not designated in any sanction list.

We concentrate our analysis on operating firms, i.e. parent companies, so that we look through intra-group adjustments and avoid the patchiness of Capital IQ data for subsidiaries. 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.[40]

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[41]. Second, we manually check on opensanctions.org that no Russian firm in the non-sanctioned sample was subject to sanctioning measures other than sectoral sanctions during 2014-2021.[42]

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.[43] 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

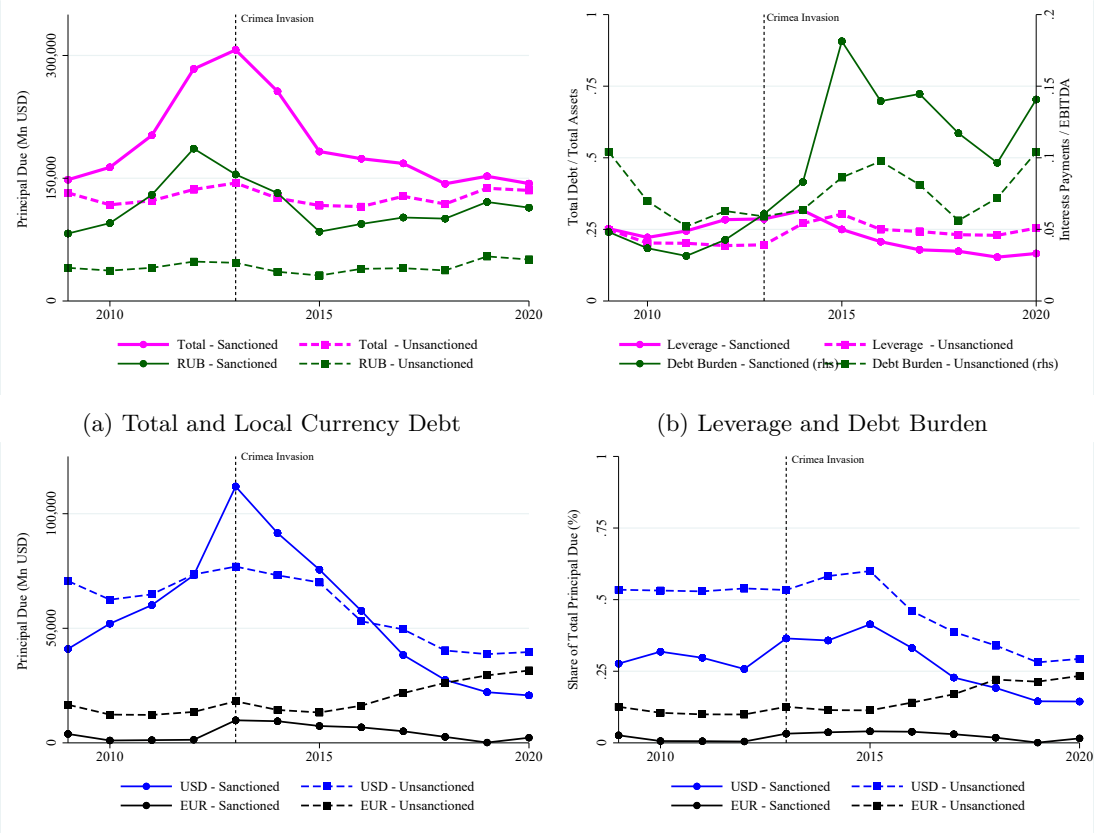
[40] Consolidated data for the Rostec group is not available in Capital IQ, while Gazprom Neft is a subsidiary of Gazprom Group, which is itself not subject to financial sectoral sanctions. Although we exclude Rostec's subsidiaries and Gazprom Neft from the evidence presented in this section, equivalent 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.

[41] Both United Aircraft Corporation and Gazprom Neft had between 3 and 4bn of USD denominated debt in 2013.

[42] This yields a sample of between 14 and 17 non-sanctioned Russian firms in 2010-2020.

[43] 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.

unsanctioned 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 unsanctioned 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.



(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. Unsanctioned firms cover the sample of Russian firms with at least 1bn USD denominated debt in 2013.

Source: Capital IQ, Authors' calculations.

4.2 The Effect of Financial Sanctions on Debt Levels and Currency Compositions

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 unsanctioned 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.[44] We look at a sample from 2010 to 2020.[45]

We then estimate the following regression

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

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, $Russia_t$ is a dummy variable equal to one if the firm operates from Russia and $Sanctioned_t$ 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.

Table 1 provides results from Equation 1 on selected measures of leverage and debt 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 unsanctioned Russian firms, by about -40% 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 three-fold increase in interest expenses and a substantial increase in debt burden.

Table 1: Russian Sanctions and Firm-level Debt

	(1)	(2)	(3)	(4)
Post × Russia	-0.519***	0.00836	-0.260	0.0188
	(0.117)	(0.0192)	(0.182)	(0.144)
Post × Russia × Sanctioned	0.179	-0.0340*	1.411***	1.137***
	(0.105)	(0.0189)	(0.0863)	(0.0734)
Estimator	OLS	OLS	OLS	OLS
Dependent Variable	Total Debt	Leverage	Interest Expenses	Debt Burden
Observations	832	832	517	493
R-squared	0.951	0.923	0.886	0.868

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

Table 2: Russian Sanctions and Firm-Level Debt Currency Composition

	(1)	(2)	(3)	(4)
Post × Russia	-0.705***	0.942***	-0.0930	0.181***
	(0.241)	(0.196)	(0.0576)	(0.0391)
Post × Russia × Sanctioned	-0.213	-0.986***	0.0582*	-0.123***
	(0.159)	(0.162)	(0.0310)	(0.0371)
Currency	USD	EUR	USD	EUR
Estimator	PPML	PPML	OLS	OLS
Dependent Variable	Total Debt	Total Debt	Currency Share	Currency Share
Observations	852	188	852	202
R-squared	0.895	0.953	0.905	0.895

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

[44] BRICS+ and CEEMEA countries.

[45] 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 we focus on start to appear in Capital IQ after 2020, limiting our analysis to 2010-2020.

Table 2 then turns 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 close to 50% compared to the control group, regardless of whether they were designated in the sectoral sanctions list. Euro-denominated debt levels, on the other hand, increased only for non-sanctioned firms, with an average increase of 18pp in the share of principal due denominated in euros.

We provide some robustness tests in Appendix B. Tables B.2 and Tables B.3 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.

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.

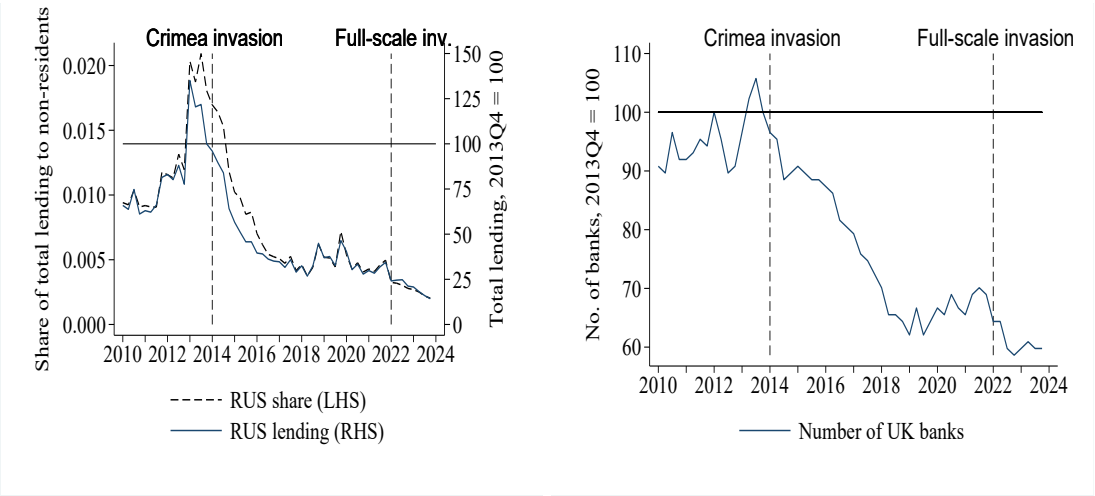
Third, the firm-level currency patterns we uncover are entirely consistent with higher relative settlement risk in U.S. dollar relative to other currencies and, particularly, the euro. Non-sanctioned firms partially substituted dollar-denominated debt with euro-denominated debt. We find no indication 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.

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 introduces both jurisdiction and currency-specific frictions in international capital flows. We rely on bank-level confidential data on global claims of UK resident banks by currency and counterparty country. 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 jurisdiction and currency frictions 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 alongside the same 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.



(a) Lending to Russia.

(b) Number of banks lending to Russia.

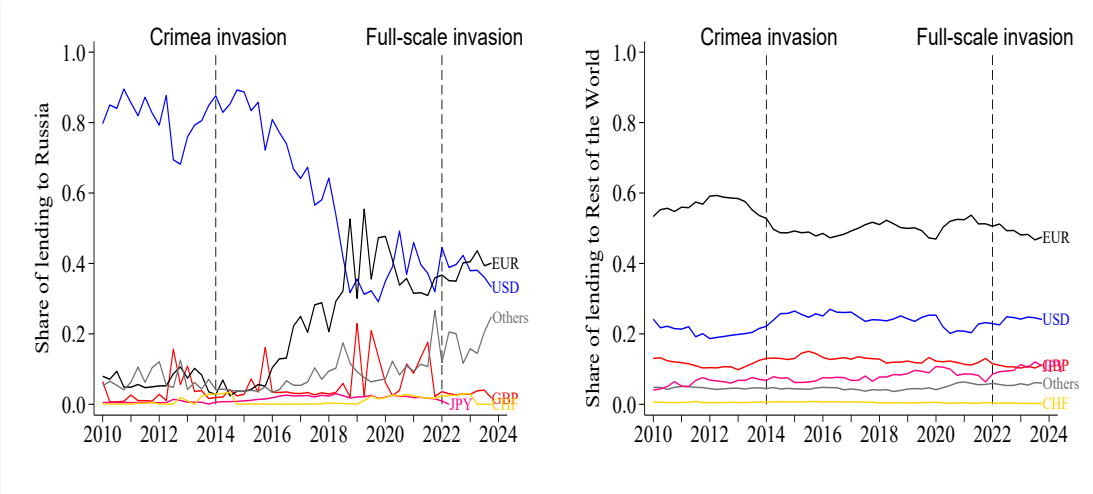
Figure 3: Global banks' total lending to Russia.

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.

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)[46] 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%.[47]



(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.

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-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 Flows 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:

[46] 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).

[47] Figure C.6 in the Appendix shows that these results are robust to winsorising lending flows 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).

$$\Delta l^{c}_{t-\tau} = \underbrace{\sum_{b} \Delta l_{b,t-\tau}}_{\text{Entry}} + \overbrace{\sum_{b} \Delta l_{b,t-\tau}}^{\text{Exit}} + \underbrace{\sum_{b} \Delta l_{b,t-\tau}}_{\text{Continuers}} \tag{2}$$

Equation 2 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 (b).[48] 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 (c) 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.

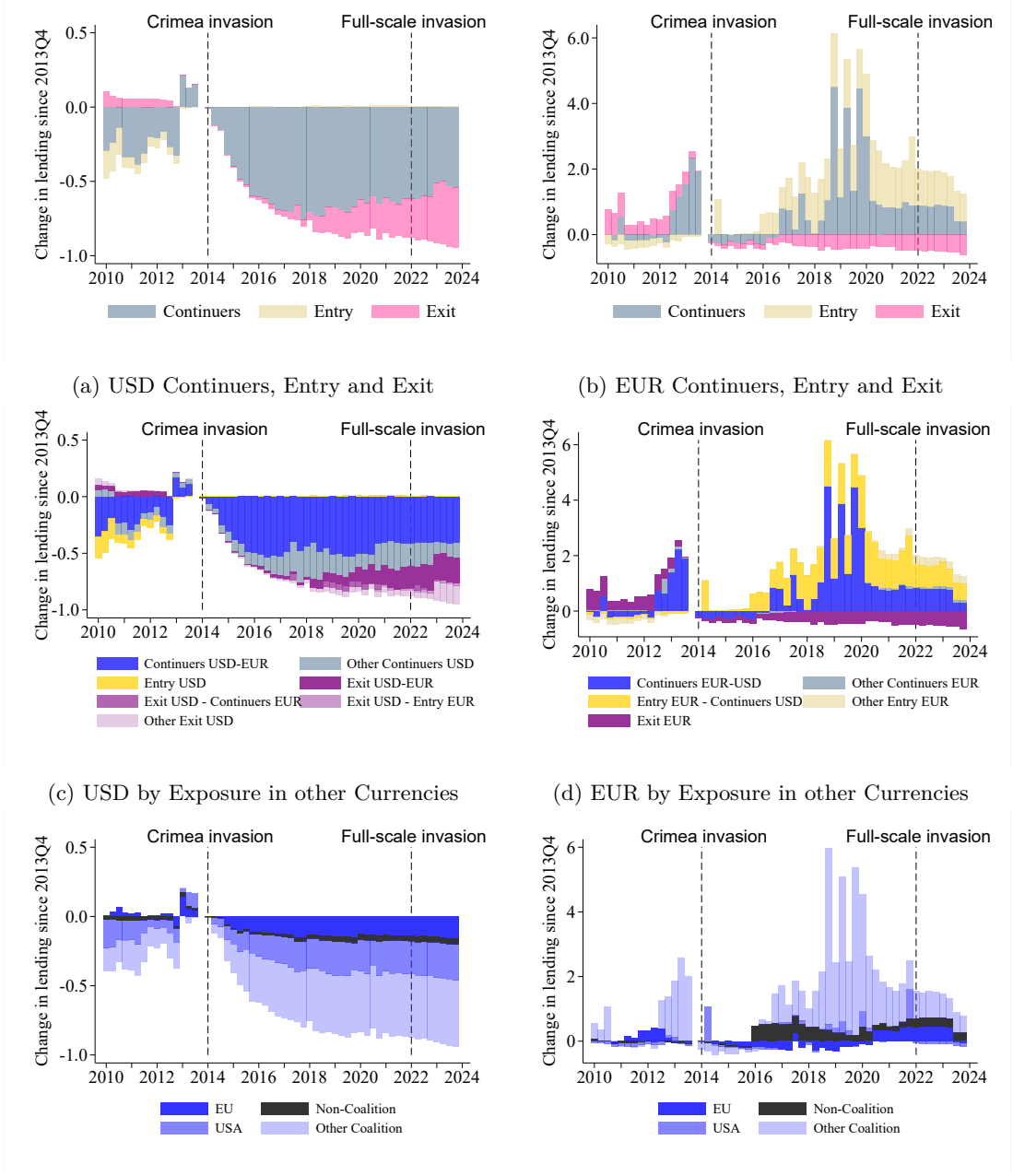
A second, related question is the nationality of the UK-based global banks that provided euro financing to Russia after 2014 and whether new credit was dominated by banks ultimately based in non-sanctioning jurisdictions. We assign our sample of banks to a certain jurisdiction based on the nationality 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 (d) of Figure 5 suggests a clear additional takeaway.[49] 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 5 and 3), 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 had any euro exposure in Russia prior to 2014, and that the shift to euro claims occurs across non-sanctioning and sanctioning jurisdictions.

[48] 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.

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

All in all, in line with In line **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.



(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 frictions 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. The parents of those UK-resident banks are ultimately based in both sanctioning and non-sanctioning jurisdictions. As a baseline, we estimate the following regression

$$\begin{aligned} l_{bct}^{RUS} = \exp\big(& \beta_1 \cdot \text{Currency}_c \times \text{Post}_t \\ & + \beta_2 \cdot \text{Sanctioning Jurisdiction}_b \times \text{Post}_t \\ & + \beta_3 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Sanctioning Jurisdiction}_b \\ & + c + \mu_{bc} + \psi_t \big) + \nu_{bct} \end{aligned} \tag{3}$$

where l_{bct}^{RUS} are claims on Russia for bank b in quarter t and currency c, for which we observe flows in U.S. dollar, euro, pound sterling, Swiss franc, Japanese yen and a residual "Other" currencies. $Post_t$, is a dummy variable that is equal to 1 after and including Q1 2014, $Currency_c$ is a currency interaction, retaining the U.S. dollar as the base category and $Jurisdiction_b$ 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.[50] In this specification, we control for bank-currency and time fixed-effects.

The triple interaction in Equation 3 provides a direct test for our propositions in Section 2. First, a negative jurisdiction interaction β_2 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**). Second, a positive currency interaction β_1 would indicate that all banks, across sanctioning and non-sanctioning jurisdictions increased claims in currency c, relative to the U.S. dollar (**Proposition 2**).

As a robustness we can expand the same specification to a panel that include UK-resident banks claims in all destination countries, as in the following equation:

$$\begin{aligned} l_{bcdt} = \exp\big(& \gamma_1 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Russia}_d \\ & + \gamma_2 \cdot \text{Sanctioning Jurisdiction}_b \times \text{Post}_t \times \text{Russia}_d \\ & + \gamma_3 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Sanctioning Jurisdiction}_b \times \text{Russia}_d \\ & + \gamma_4 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Sanctioning Jurisdiction}_b \\ & + \omega_{bcd} + \tau_{bt} + \kappa_{ct} + \chi_{dt} \big) + \nu_{bcdt} \end{aligned} \tag{4}$$

Note that the panel required to estimate Equation 4 has an additional dimension, destination d, allowing for a fourth interaction variable, $Russia_d$, i.e. a dummy equal to 1 for claims on Russia. The fullest specification in this robustness excercise includes bank-time, currency-time, and destination-time fixed effects that flexibly control for any time-varying factors specific to each dimension. Identification comes from within-bank–currency–destination variation over time, net of these broader time-varying influences.

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

Table 3: Effect of Jurisdiction and Currency Frictions on Bank Claims on Russia after 2014

	(1)	(2)	(3)	(4)	(5)
EUR x Post	2.014***	0.316	0.460	0.465	
	(0.643)	(0.397)	(0.385)	(0.447)	
EUR x Post x Russia		1.697***	1.554**	1.599**	1.635**
		(0.643)	(0.622)	(0.692)	(0.680)
Post x Coalition Bank	-0.584**	-0.244	-0.258		
	(0.289)	(0.164)	(0.174)		
Post x Russia x Coalition Bank		-0.340***	-0.326***	-0.237	-0.240**
		(0.129)	(0.125)	(0.144)	(0.114)
Observations	15,385	1,613,740	1,611,694	1,332,163	1,332,163
Pseudo R^2	0.794	0.909	0.915	0.941	0.942
Sample	Russia Claims	All Claims	All Claims	All Claims	All Claims
Bank-Currency FE	✓				
Time FE	✓	✓			
Bank-Destination-Currency FE		✓	✓	✓	✓
Destination-Time FE			✓	✓	✓
Bank-Time FE				✓	✓
Currency-Time FE					✓

PPML estimates on the full sample of UK resident banks cross-border claims columns (2) to (5) or on claims on Russia only in Column (1), from 2010 Q1 to 2021 Q4. The "Post" treatment period starts in 2014 Q1 and the U.S. dollar is the base currency category. Column (1) reports coefficients β_1 and β_2 from Equation 3. Column (2) to (5) report coefficients γ_1 and γ_2 from 4, and, as we introduce progressively additional fixed-effects in columns (2) to (4), lower order interactions that get absorbed in the fullest saturation. The full set of coefficients for Columns (1) and (5), including interactions with other currency than the euro are reported in the Appendix in Tables C.4 and C.5. Standard errors clustered at bank and time in Column (1) and bank, destination and time in Columns (2) to (5). Significance: *** p < 0.01, ** p < 0.05, * p < 0.10.

Both specifications are estimated in PPML adding "zero" flows in order to allow us to account for both the extensive and intensive margin of lending. The complete set of coefficients for all currency interactions are provided in Tables C.4 and C.5.[51] In what follows we focus on a subset of the estimated coefficients only. Table 3 reports our interactions of interest for Equation 3, β_1 for the euro only, as well as β_2, in Column (1), estimated on the sample of UK banks russian claims. Column (2) to (5) broaden the analysis to the full sample of UK bank claims and progressively saturate fixed-effects up to the ones in Equation 4, which reports our main coefficients of interest γ_1, for the euro only, and γ_2.

The estimated β_1 is consistent with our **Proposition 2**. Across banks, regardless of whether they belonged to the sanctioning coalition, it implies a relative shift of Russian claims into euros by a factor of six. Similarly, the estimated β_2 implies a reduction of claims on Russia of sanctioning coalition banks, relative to non-sanctioning coalition banks, by about 45%, in line with **Proposition 1**. Using non-Russian claims and saturated fixed effects reduce somewhat the estimated magnitude. As shown in Column (5), the specification in Equation 4, controlling for bank-time, currency-time and destination-time fixed-effects, implies a within bank-currency-destination a relative shift of Russian claims into euros by a factor of four. The estimated differential response of sanctioning coalition banks is lower, with an estimated relative reduction vs. non-sanctioning coalition banks of about 20%.

In Figure 6 we plot higher order interactions for Equations 3 and 4, both for the euro and the residual "other" currency categories, which is likely to mostly include rubles and, in the rest of the sample, the

[51] On top of our baseline equations, we provide in both tables a specification where looking at heterogenous additional response for, in turn, EU banks and Japanese and Swiss banks, as robustness test of coalition symmetry for jurisdiction-based frictions, in line with the discussion in Section 2.

respective local currency for the destination. zooming-in on the currency interaction coefficients for the euro and the "Other" residual currencies, which in the case of Russia is likely to mostly include rouble claims. Looking at the higher order Currency-Bank Jurisdiction interactions for the euro, they show no differential additional shift into euro claims for sanctioning coalition banks.

Moving to the "Other" currency claims, there is no evidence of a relative shift across banks analogous to what we see for the euro. Furthermore, the shift into "other" currency claims for sanctioning coalition banks only is large and significant when looking at the "Currency-Bank Jurisdiction" interaction estimated on the Russian claims sample but, once considering all global claims and saturated fixed effects, the point estimate is very close to zero and not significant at conventional levels. Results are consistent with these patterns other currencies interaction. As shown in Tables C.4 and C.5, the only other currency for which we seem to have consistent evidence of relative dollar substitution is the Swiss franc.

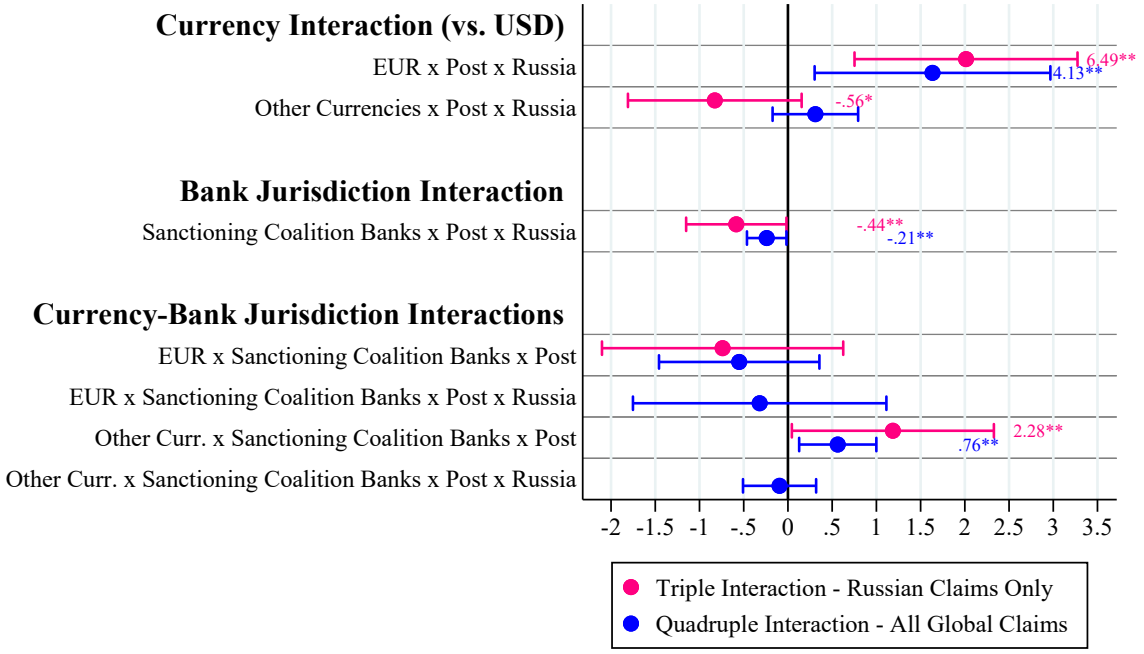
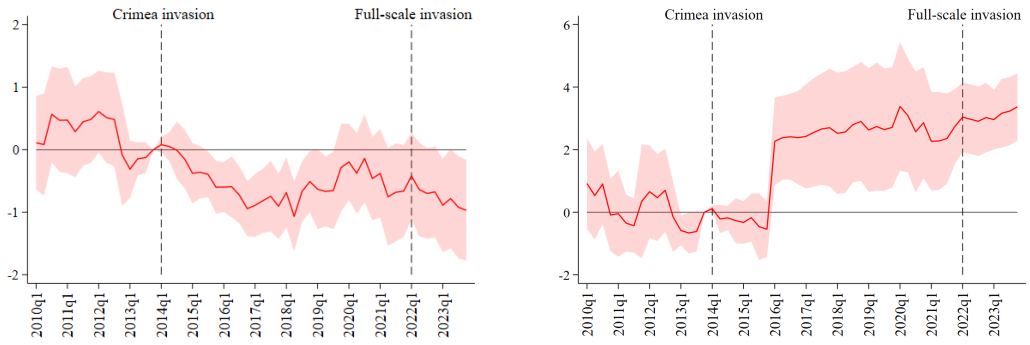


Figure 6: Estimated Effect of Jurisdiction and Currency Frictions

Note. Selected estimated coefficients from Equations 3 (Triple Interaction) and 4 (Quadruple Interaction). The numbers provided next to the plotted coefficient are the percentage change effect derived from exponentiation. Standard errors clustered at bank and time when estimating Equation 3 and bank, destination, time when estimating Equation 4. Significance: *** p < 0.01, ** p < 0.05, * p < 0.10.

To summarise, the overall de-risking from Russia is therefore shown to be stronger for banks under a sanctioning jurisdiction on a nationality basis (**Proposition 1**). However, the within-bank shift from dollars to euros is homogenous across jurisdictions, in line with U.S. extra-territorial jurisdiction increasing sanction compliance risk in dollars vs euros for all banks globally (**Proposition 2**).

Figure 7 depicts the dynamic effects of our main interactions of interest in Equation 3, β_1 and β_2. Three results emerge. First, 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



(a) Sanctioning Coalition Bank x Post

(b) Euro x Post

Figure 7: Dynamic Estimates of Jurisdiction and Currency Interactions

Note. – This figure plots the dynamics of the Jurisdiction (β_2) and Currency (Euro) interaction (β_1) from Equation 3 (Triple Interaction) estimated on Russian claims only. Panel (a) therefore depicts the estimated shift of Russian claims for banks whose parent was based in a sanctioning jurisdiction, relative to other banks, across all currencies. Panel (b) depicts the shift in claims denominated in euros, relative to dollar claims, across all banks, regardless of whether their parent was based in a sanctioning jurisdiction.

the diplomatic agreement reached in July 2014. Second, de-risking of sanctioning jurisdiction banks relative to non-sanctioning jurisdictions banks begun as soon as the second half of 2014. The within-bank shift from dollars to euros, on the other hand, starkly picks up in 2016, as large non-sanctioned Russian entities returned to global capital markets for the first time since the invasion of Crimea (See Section 2).

The sudden jump in euro substitution in 2016 might raise the question of the exact transmission of higher relative settlement risk in U.S. dollar for transactions subject to sanction-compliance risk. In particular, to what extent the risk was internalised by cross-border lenders, as opposed to the Russian government enacting anti-coercion policies affecting non-sanctioned Russian firms' actions as they started returning to global capital markets. Both transmission channels are potentially at play, although they come from the same currency-specific friction: settlement risk is concerns borrowers as much as lenders as highlighted in Section 2. Nonetheless, we show in the next sub-section that global banks, regardless of governments' anti-coercive actions. We isolate bank-specific perceptions of sanction-compliance risk by adapting the above specifications to estimate currency and jurisdiction substitutions in non-Russia emerging mmarkets, isolating the impact on banks that were exposed to Russia when Crimea was invaded.

5.3.2 Sanction Risk Spillovers: De-Risking of Russia-Exposed and Sanctioning Coalition Banks in other Emerging Markets

We now ask whether banks internalised higher sanction compliance risk in U.S. dollar transactions and for destinations more likely to be sanctioned in the future. In other words we test whether substitution away from the U.S. dollar and into euros, as well as a relative decline of claims by banks from sanctioning jurisdictions can be detected in claims to non-Russia emerging markets. To sharpen our identification of the global transmission of sanction-compliance risk we also introduce an additional bank-specific interaction, $RussiaPosition_b^{2013Q4}$, that is equal to one if the bank had a claim on Russia in 2013 Q4.

We estimate the following variation of Equation 4:

$$
\begin{aligned}
l_{bcdt} = \exp\big(\ & \theta_1 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Destination}_d \\
& + \theta_2 \cdot \text{Russia Position}_b^{2013Q4} \times \text{Sanctioning Jurisdiction}_b \times \text{Post}_t \times \text{Destination}_d \\
& + \theta_3 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Russia Position}_b^{2013Q4} \times \text{Sanctioning Jurisdiction}_b \times \text{Destination}_d \\
& + \theta_4 \cdot \text{Currency}_c \times \text{Post}_t \times \text{Russia Position}_b^{2013Q4} \times \text{Sanctioning Jurisdiction}_b \\
& + \omega_{bcd} + \tau_{bt} + \kappa_{ct} + \chi_{dt}\ \big) + \nu_{bcdt}
\end{aligned} \tag{5}
$$

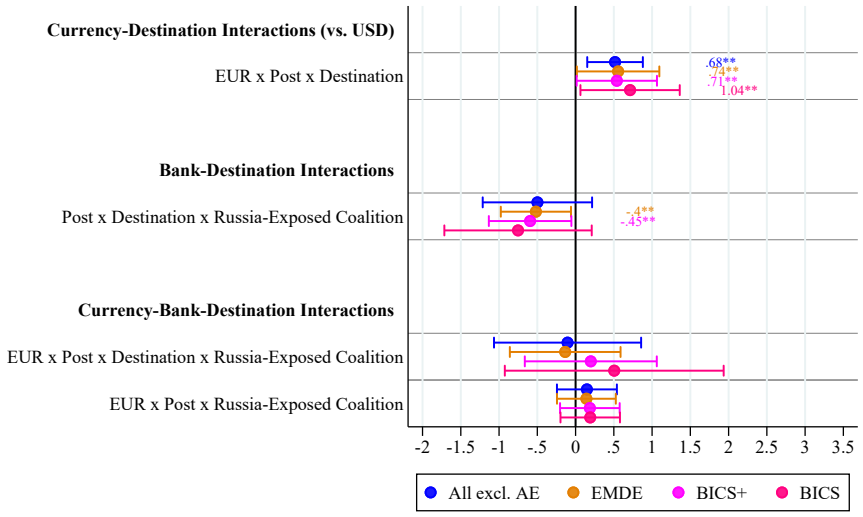
where we exclude claims on Russia from the estimating sample and the bank-specific interaction is jointly determined by whether the bank was both under the jurisdiction of a sanctioning country and exposed to Russia in 2013 Q4. We vary $Destination_d$ to consider different treated groups of emerging market countries. We consider in turn, all countries that are not Advanced Economies or part of the EU, all emerging-markets and developed economies (EMDE) and the BRICS countries excluding Russia. The latter is of particular interest as it potentially captures closer alignment to Russia. We consider both the broader BICS+ group, formed by all countries that have since joined the BRICS organisation as of 2025[52] and the original four-country BICS.

As shown in the plotted coefficients in Panel (a) of Figure 8 we find evidence of de-risking spillovers in non-Russia emerging markets. Following the invasion of Crimea, UK resident global banks subject to the sanctioning coalition jurisdiction and exposed to Russia via their London-booked claims decreased their claims to EMDE destinations by 40% relative to non-sanctioning coalition banks. Furthermore, once we control for jurisdiction and exposure, all banks, regardless of where their parent company was based, increased euro claims relative to dollar claims by a factor of two. As it might be expected, results are stronger when considering BICS countries only, although the point estimate for the Bank-Destination interaction is not statistically significant at conventional levels when considering the four country original BICS. All in all, these results might suggest our estimates on the effect of jurisdiction and currency-specific frictions on Russian claims might be a lower bound. The within bank-currency-destination effect for jurisdiction-specific frictions is therefore in line to what we find in Russia, while the currency shift is smaller in magnitude, compared to what we estimate looking at claims on Russia.

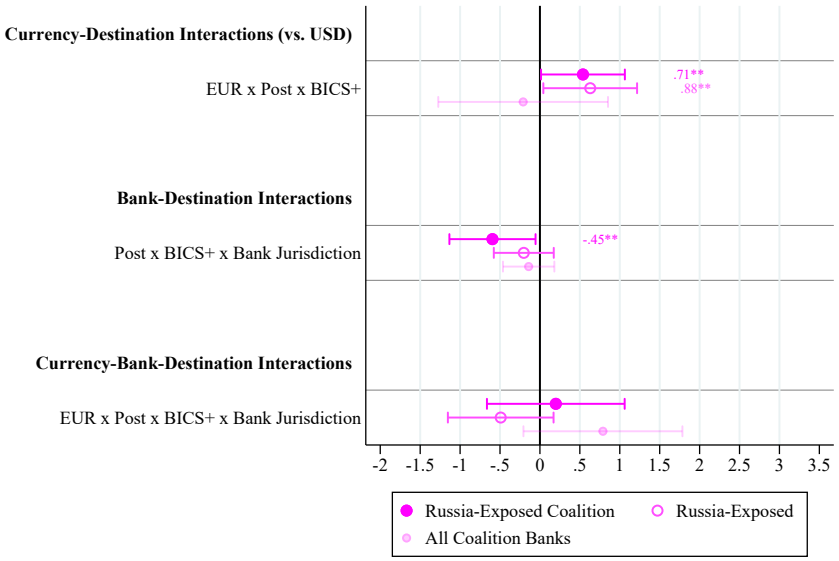
In Panel (b) of Figure 8 we unpack the the relative contribution of Russian exposure and bank jurisdiction in driving our de-risking spillover results on the BICS+ group. "Russia-Exposed Coalition" plots are equivalent to the BICS+ plots in Panel (a) and reproduce the exact specification of Equation 5. We therefore vary our baseline specification by dropping the $Sanctioning\ Jurisdiction_b$ interaction and consider shifts across all Russia-exposed banks regardless of their jurisdiction in the "Russia-Exposed" plots. The "All Coalition Banks" provide a placebo exercise of sort by testing whether de-risking in non-Russia emerging markets occurred for all sanctioning coalition banks, regardless of their pre-Crimea exposure to Russia. The plotted results are consistent with non-Russia emerging-markets de-risking being jointly driven by both banks being exposed to Russia and having a parent based in a sanctioning jurisdiction. Furthermore, no across-banks shift to euro, relative to dollars, can be detected withouth controlling for differential shifts in claims by Russia-exposed banks.

This confirms that Russia exposed global banks internalised higher sanction compliance risk across both the jurisdiction and currency dimensions. Shifts in currency patterns in Russia are therefore also likely to be driven, to a large extent, by banks de-risking decisions, rather than the Russian government's anti-coercive policies.

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



(a) De-Risking Spillovers on Emerging Markets Claims for Russia-Exposed Coalition Banks



(b) De-Risking Spillovers on BICS+ Claims by Russia-Exposure and Sanctioning Jurisdiction

Figure 8: Banks' Russia-Exposure Spillovers on non-Russia Emerging Markets Claims

Note. – Panel (a) shows PPML estimates of Equation 5 where we vary the $Destination_d$ interaction and test de-risking for different groups of emerging markets for coalition banks with pre-Crimea Russia exposure. Panel (b) compares the BICS+ estimates in Panel (a) to variations of Equation 5 where we drop $Sanctioning\ Jurisdiction_b$, considering all "Russia-Exposed" banks, or, conversely, $RussiaPosition_b^{2013Q4}$, considering whether coalition banks de-risked from emerging markets regardless of Russia-exposure.

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

In this section we sharpen our understanding of the drivers of euro-isation by turning our attention to 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 are therefore able to test the shift in both prices and quantities due to jurisdiction and currency-specific frictions 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).

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 for, respectively, loans originated by sanctioning coalition banks vs non-sanctioning coalition banks and loans originated in other currencies than the U.S. dollar. As described in Section 3, our variables of interest are aggregated at the borrower-lender-currency-year level, for which we 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 belonged to a sanctioning jurisdiction.[53]. As expected, Panel (a) 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.

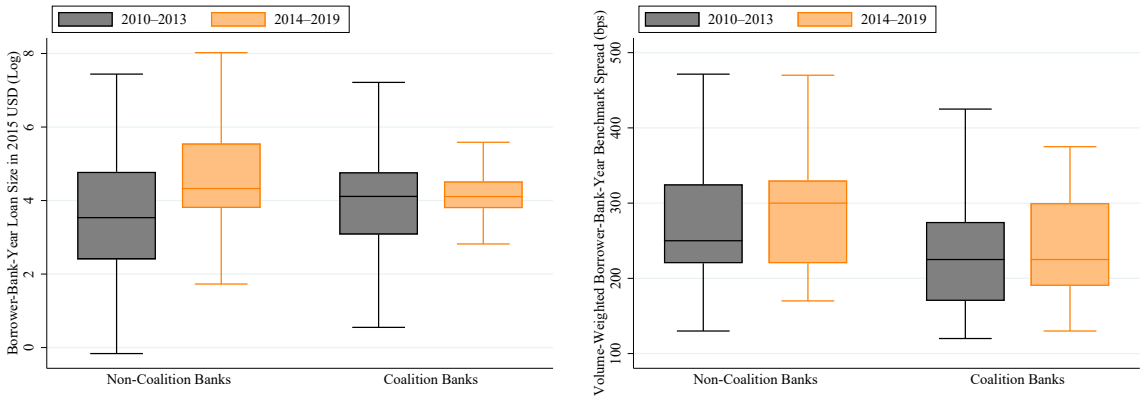
Figure 10, on the other hand, reports the equivalent charts looking along the currency split of Russian syndicated loans volumes and prices. We note two main points. On the one hand, Panel (a) shows that euro and rouble yearly lending volumes increased markedly relative to dollar loan volumes. We do not observe enough prices for rouble loans in DealScan after 2014 so Panel (b) only concerns dollar and euro loans. 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 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.

6.2 Disentangling Jurisdiction and Currency Frictions in Russian Syndicated Loans

An important challenge to identifying the differential credit supply response of sanctioning coalition and non-coalition lenders to financial sanctions, and, equivalently, the choice of the currency denomination of the loan, is that they might lend to borrowers with different characteristics, and sanction risk might

[53]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.



(a) Average Loan Size

(b) Average Loan Spread

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.

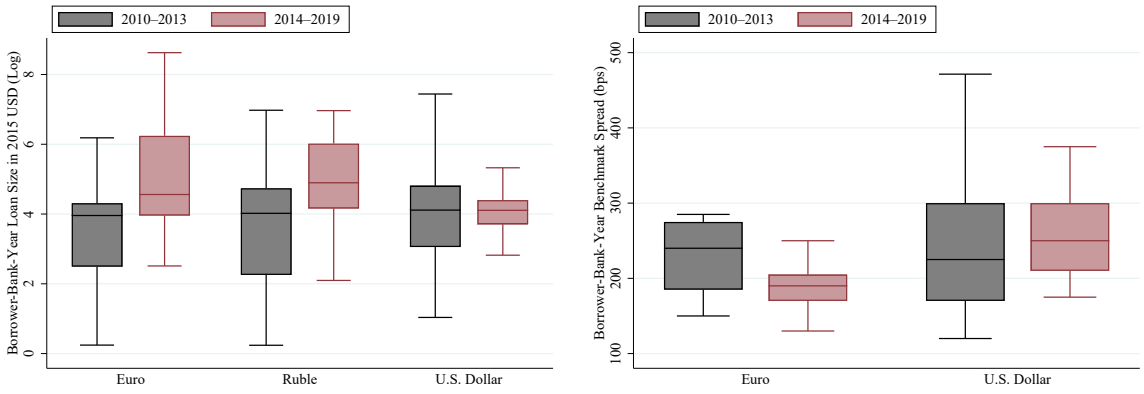
affect the credit demand of these borrowers differently. As highlighted by Elliott et al. (2024) in the context of banks and non-banks, two features of the syndicated lending market allow us to cleanly isolate the credit supply response. First, syndicated loans involve multiple lenders to one borrower. This means that we can exploit within-borrower variation by comparing how different institutions lend to the same firm. Secondly, although the borrower selects the lead arranger, the remaining lenders in the syndicate are chosen through a book-building process managed by the lead arranger, leaving the borrower with no influence over their selection. Finally, as the price of loan across currencies is expressed as a spread over the risk-free rate, this already absorbs most of the differential pricing implied by different money market paths.

We begin by estimating the following baseline model considering only loans originated to Russian firms

$$\begin{aligned} y_{blct} = \beta_1 \cdot Post_t \times Currency_c \; + \beta_2 \cdot Post_t \times Sanctioning\ Coalition_l \\ + \; \delta_{bt} \; + \; \eta_l \; + \; \sigma_c \; + \; u_{blct} \end{aligned} \tag{6}$$

where the dependent variable is either the annual loan volume or the volume-weighted benchmark spread on new syndicated credit extended by lender l, to borrower b, denominated in currency c and originating in year t. The dummy $Post_t$ equals one if the loan originates after, and including, 2014, while $Sanctioning\ Coalition_l$ equals one when the country of the lender's ultimate parent is part of the sanctioning coalition. Finally, $Currency_c$ is a dummy that has the dollar as the reference category and considers all other currencies individually. When looking at the entire sample of loan volumes we consider both euro and rouble-denominated loans, on top of dollar denominated ones. On the other hand, when looking at the sample of loans for which pricing information is available, we are only able to consider dollar and euro denominated loans, due to lack of pricing information for most rouble loans after 2014. We include borrower-time, lender and currency fixed-effects.

The coefficients of interest β_1 and β_2 therefore provide an estimate of the 2014 sectoral sanctions-induced shift in the price (or quantity) of loans along the jurisdiction and currency dimension, respectively. Focusing on prices, β_2 can be interpreted as the compensation for sanction-compliance risk



(a) Average Loan Size

(b) Average Loan Spread

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.

required by banks subject to a sanctioning jurisdiction, within the same borrower over-time. β_1 could be interpreted as the settlement-risk premium in U.S. dollars relative to euros, given the sanction compliance risk embedded in any U.S. dollar transaction cleared by U.S. correspondent banks.

We also perform a more comprehensive empirical exercise, where we estimate the following equation on the full sample of Russian and Emerging Markets borrower-lender-currency-year observations denominated in either U.S. dollars or euros

$$\begin{aligned} y_{blct} = \; & \beta_1 \cdot Post_t \times EUR_c \times Russia_b \\ & + \beta_2 \cdot Post_t \times Coalition_l \times Russia_b \\ & + \beta_3 \cdot EUR_c \times Russia_b \\ & + \beta_4 \cdot Coalition_l \times Russia_b \\ & + \delta_{bt} + \tau_{lct} + u_{blct} \end{aligned} \tag{7}$$

Notice that, with an additional panel dimension, we can now add a dummy $Russia_b$ which equals one when the loan is originated by a Russian firm. This allows us to introduce tighter sets of fixed effects. In our preferred specification we absorb for borrower-time fixed effects $\delta_{b,t}$ and lender-currency-time fixed effects $\delta_{l,t}$, absorbing all borrower-level shocks and demand conditions in a given period, as well as lender- and currency-specific funding, risk, and market conditions in a given period. We provide, in both the body and the Appendix, versions of both Equation 6 and 7 with a lower level of saturation, as well as a tighter specifications including a within borrower-lender fixed effect, which however significantly reduces the number of observations at our disposal.[54]

[54] We typically do not have enough statistical power, particularly when saturating fixed-effects as in our preferred specification, to include higher order interactions and separately estimate the additional effect on, say, euro loans volumes for sanctioning coalition banks, similarly to what we were able to do in our bank-level empirical analysis. In this respect, the specification builds on the results presented in Section 5, showing that currency shifts out of the U.S. dollar were symmetric across sanctioning coalition and non-sanctioning banks. Results including higher-order interactions are available upon request.

6.2.1 Evidence on the Full Sample of Loan Volumes to Russia

Recall that we do not observe prices for the vast majority of loan deals in DealScan. We therefore begin by an analysis of our full sample of loans limited to the *quantity* responses to our jurisdiction and currency frictions following the imposition of sectoral sanctions in 2014. The coefficients of interest for a varieties of specifications with varying saturations in fixed effects are shown in Table 4, looking at the intensive and extensive margins estimates (PPML) and including our preferred baselines in Equation 6 and Equation 7, which are shown in Columns (3) and (6), respectively.

Table 4: Sanction Risk and Russian Syndicated Loan Quantities after 2014

	(1)	(2)	(3)	(4)	(5)	
Panel A: Russian Loans						
Post × Rouble	0.495	0.403	2.609***	0.834	2.288***	
	(0.747)	(0.756)	(0.516)	(0.741)	(0.505)	
Post × Euro	2.988***	3.047***	3.474***	2.746***	3.132***	
	(0.499)	(0.486)	(0.635)	(0.455)	(0.676)	
Post × Coalition	-0.740	-0.938*	-0.168			
	(0.551)	(0.548)	(0.327)			
Observations	18,610	18,610	5,553	11,310	3,828	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: All Emerging Market Loans						
Post × Russia	-1.349***	-1.294**		-1.133***		
	(0.519)	(0.512)		(0.352)		
Post × Euro × Russia	2.775***	2.800***	3.345***	2.805***	3.075***	2.292***
	(0.532)	(0.526)	(0.684)	(0.490)	(0.666)	(0.567)
Post × Coalition × Russia	-0.534	-0.634	-0.212	-0.653	-1.308***	-0.984**
	(0.583)	(0.574)	(0.391)	(0.454)	(0.452)	(0.418)
Observations	314,760	314,760	95,412	242,413	76,668	73,350
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				
Borrower-Year FE			✓		✓	✓
Lender-Year FE				✓	✓	
Currency FE	✓	✓	✓	✓	✓	
Lender-Currency-Year FE						✓

Panel A reports estimates of intensive and extensive margin quantity responses for Russian loans only (See Table D.9 for detailed results). Panel B reports estimates for the combined Russia and Emerging Markets loan sample (See Table D.11 for detailed results). The U.S. dollar is the base currency category. All regressions shown are PPML with standard errors clustered by lender and borrower-currency-year.

Panel (A) focuses on the Russian loans sample and allows us to examine a substitution shift in both euros and roubles. In our preferred specification, the estimated coefficients imply a shift, that includes both the extensive and intensive margins, by a factor of twenty-nine for the euro, and of eleven for the rouble, relative to the U.S. dollar. Interestingly, the shift into roubles only appears as significant when absorbing borrower-year fixed-effects, i.e. time varying demand conditions of Russian firms.

Panel (B) allows us to saturate fixed-effect further by considering the whole sample of Emerging Markets loans. First, Columns (1), (2) and (4) allow us to estimate an overall effect on the within borrower and lender decline in credit after the imposition of sectoral sanctions, by a factor of about

2.5. Second, our preferred specification in Column (6) provides an estimated shift into euros, relative to dollars, by a factor of nine. The magnitude of the coefficients varies little when absorbing different sets of fixed-effects. Conversely, the estimated jurisdiction-specific shift in lending to Russia is estimated to be smaller in magnitude, with a decline by about 60% in lending volumes by sanctioning coalition banks relative to non-sanctioning coalition banks. It is to be noted that the coefficient is only statistically significant when accounting for both time-varying credit supply (lender-time) and demand (borrower-time) fixed effects.

All in all, the loan-volume flows evidence from the syndicated loans markets are consistent with our findings looking at the stock of claims of global UK banks on Russia. We confirm a large relative shift into euros and in favour of non-sanctioning coalition lenders, with the former exhibiting a much larger magnitude than the latter. This higher magnitude for within bank and borrower point estimates on the syndicated loan data, compared to the banking claims data, is in principle intuitive, as it allows us to focus on credit flows, rather than stocks of claims.

Table 5: Sanction Risk and Russian Syndicated Loan Prices after 2014

	(1)	(2)	(3)	(4)	(5)	
Panel A: Russian Loans						
Post × Euro	-60.48***	-49.52***	-52.32***	-49.74***	-44.97***	
	(17.49)	(11.83)	(14.90)	(14.06)	(12.56)	
Post × Coalition	18.24	118.0***	-0.310			
	(14.91)	(29.92)	(4.095)			
Observations	1,105	505	1,100	930	920	
	(1)	(2)	(3)	(4)	(5)	(6)
Panel B: All Emerging Market Loans						
Post × Russia	33.05	-167.2***		24.01		
	(25.40)	(11.70)		(20.14)		
Post × Euro × Russia	-119.6***	-95.92***	-47.01***	-96.98***	-42.82***	-54.65***
	(32.19)	(30.70)	(15.72)	(29.69)	(14.55)	(19.02)
Post × Coalition × Russia	-16.85	175.8***	-4.288	-17.95*	-4.403	-0.421
	(11.99)	(13.40)	(3.002)	(10.49)	(5.616)	(4.295)
Observations	22,781	10,434	22,706	20,758	20,674	19,674
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				✓
Borrower-Year FE			✓		✓	✓
Lender-Year FE				✓	✓	
Currency FE	✓	✓	✓	✓	✓	
Lender-Year-Currency FE						✓

Panel A reports estimates of price responses responses in basis-points of spread over benchmark for Russian loans only (See Table D.15 for detailed results). Panel B reports estimates for the combined Russia and Emerging Markets loan sample (See Table D.19 for detailed results). The U.S. dollar is the base currency category. All regressions shown are estimated via OLS with standard errors clustered by lender and borrower-currency-year.

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

We now turn to jointly examining jurisdiction and currency-specific shifts in both prices and quantities of Russian loans. We begin by considering Table 5, which again summarises different fixed effect saturations of our preferred specifications in Equations 6 and 7, this time looking at our sample of loan prices.

The estimated price shift is consistently negative for the euro, with a negative premium relative to the dollar varying between around 120 and 50 basis-points, depending on the specification. In our preferred specification in Column (6), the point estimate is of a negative premium of 54 basis-points, absorbing borrowers' time varying characteristics and lenders' time-varying shocks to loan pricing specific to each bank in each currency. Conversely, the estimated price shift coming from jurisdiction-specific frictions is for the most part estimated as not statistically different from zero, particularly when accounting for time varying credit supply and demand characteristics.

We now proceed to compare jurisdiction and currency-specific shifts in both prices and quantities. Table 6 summarises our coefficients of interest for our preferred specification of Equation 7, highlighting quantity responses, with (PPML) and without (OLS) considering the extensive margin, on the whole sample of Emerging Markets loans in Columns (1) and (2) and on the sample of loans for which we have pricing information in Columns (3) and (4); price responses are reported in Columns (5) and (6) in both level and logs of spread over the benchmark.

Starting with the jurisdiction-driven shift, we only find evidence in line with a decrease in the relative supply of credit by sanctioning coalition banks when considering both the extensive margin and the whole sample of DealScan loans, including those for which we do not observe pricing information. We furthermore find no evidence that prices applied to sanctioning coalition banks loans responded differently to the 2014 sectoral sanctions compared to non-sanctioning coalition bank credit. The fact that we observe a relative fall in coalition-bank lending to Russia, but no differential price response for coalition-bank loans, is consistent with an increase in compliance costs causing coalition banks to reduce the quantity of Russian deals they are willing to book — particularly by withdrawing relationships on the extensive margin — rather than reprice the loans they continue to extend.

On the other hand, we consistently find a positive euro-denominated quantity responses, together with a statistically significant decline in relative euro lending spreads. This indicates that Russian borrowers receive relatively more credit in euros than in dollars after the 2014 sectoral sanctions, and at comparatively better prices, once we absorb time-varying borrower-specific conditions and bank–currency conditions. This is consistent with higher sanction-compliance risks in dollar settlement, relative to euros.

Our estimates of the quantity and price responses can be interpreted as revealing the degree of supply-side substitutability between the euro and the dollar as vehicle currencies for cross-border lending. The negative premium on euro loans estimated in Table 6 corresponds to a 23 percent decline in the euro–dollar spread ratio. On the overlapping sample for which spreads are observed, the corresponding relative quantity response rises by around 75 percent. Taken together, these movements imply a supply-driven substitution elasticity between vehicle currencies of roughly 3. If we assume that the estimated price effects carry over to the full sample of loan volumes—including the extensive margin—or if we use point estimates with different fixed-effects specification, the implied elasticity would be substantially larger. For example, looking at Column (5) in Tables D.17 and D.20, when absorbing for time-varying borrower and lender conditions and a currency fixed-effect only, the equivalent number would be about 13.

For context, Clayton, Maggiori, and Schreger (2025b) employ elasticities of approximately 5 for traded goods and 1.7 for financial services in settings where trade barriers generate joint price–quantity adjustments. While these values are not directly comparable to our capital flows environment, they

nevertheless suggest that an elasticity on the order of 3 represents a relatively strong degree of substitutability across vehicle currencies on the supply side.

Table 6: Summary of Quantity and Price Regressions

	Quantities				**Prices**	
	Level	Log	Level	Log	Level	Log
	(1)	(2)	(3)	(4)	(5)	(6)
Post × Euro × Russia	2.292***	0.784**	0.569***	0.753***	-54.65***	-0.229**
	(0.567)	(0.356)	(0.179)	(0.243)	(19.02)	(0.0912)
Post × Coalition × Russia	-0.984**	0.167*	0.197	0.286	-0.421	0.0285
	(0.418)	(0.0948)	(0.256)	(0.179)	(4.295)	(0.0396)
Observations	73,350	33,344	19,728	19,728	19,674	19,674
Estimator	PPML	OLS	PPML	OLS	OLS	OLS
Sample	All	All	Price Sample	Price Sample	Price Sample	Price Sample
Borrower-Year FE	✓	✓	✓	✓	✓	✓
Lender-Currency-Year FE	✓	✓	✓	✓	✓	✓

Notes: The tables compare our preferred specification, including borrower-year, lender-year and currency fixed effects across quantity and price regressions. Columns (1)–(2) report quantity regressions, with and without considering the extensive margin, on the full sample of emerging market bank-borrower-currency-year obserations. Columns (3)–(4) report the same quantity-response results but for the sample bank-borrower-currency-year obserations for which we have price data. Columns (5)–(6) report results for the price response estimated on the sample of emerging markets loan prices. Detailed results for each columns can be found in Tables D.11, D.17, D.18, D.19 and D.20.

7 A Capital Flows View of Geo-economic Power

We now 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%.

We put forward in this section a capital flows view on the "share of controlled inputs", 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

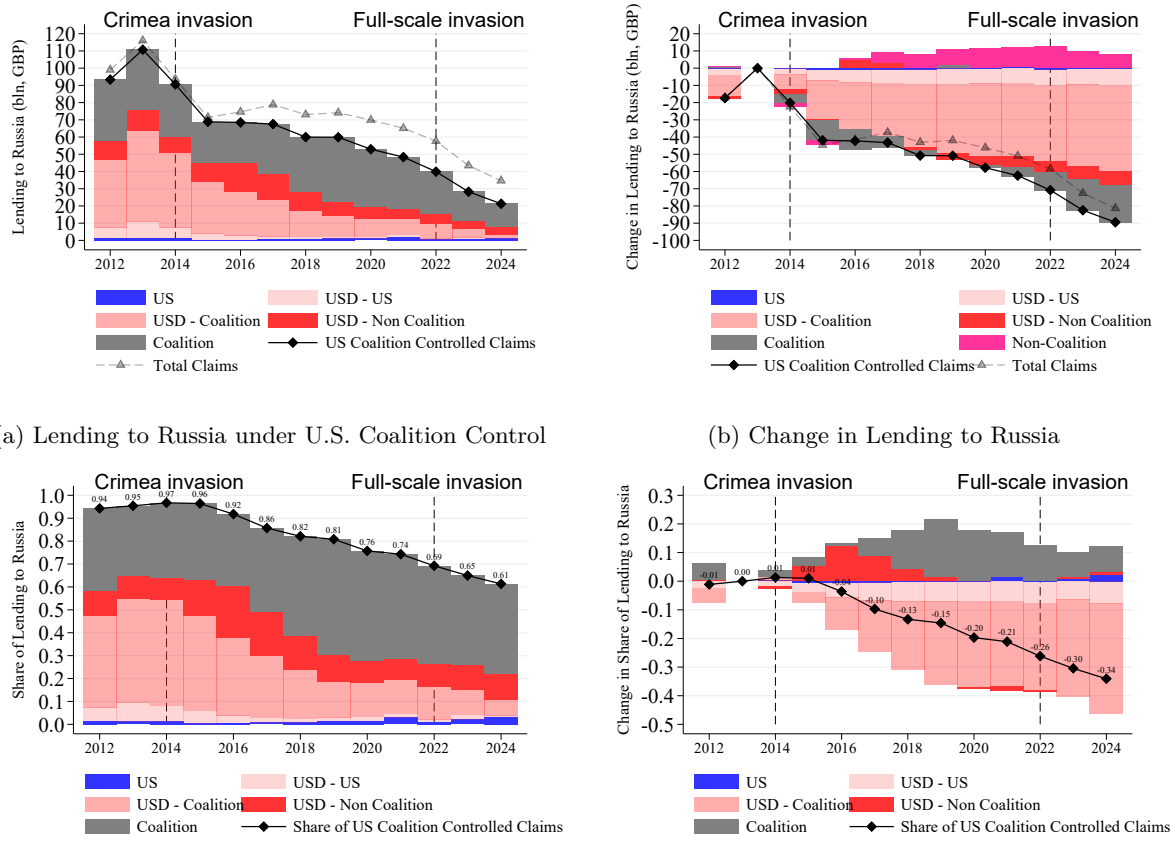
Consider an hegemonic power h, exerting extra-territorial jurisdiction on the use of its currency k_h. Let $\mathrm{K}_{bit}^{(z)}$ denote the claims of bank b on agents from country i at time t in currency z. Then we define the cross-border financial inputs of country i's controlled by hegemon h at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

$$\Phi_{it}^{(h)} = \underbrace{\sum_{b:\,\mathrm{J}(b)=h} \sum_{z} \mathrm{K}_{bit}^{(z)}}_{\text{Hegemon banks, All currencies}} + \underbrace{\sum_{b:\,\mathrm{J}(b)\in\mathcal{C}_h} \sum_{z} \mathrm{K}_{bit}^{(z)}}_{\text{Coalition banks, All currencies}} + \underbrace{\sum_{b:\,\mathrm{J}(b)\notin\{h\}\cup\mathcal{C}_h} \mathrm{K}_{bit}^{(z_h)}}_{\text{Hegemon currency}}. \tag{8}$$

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.



(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.

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 $\Phi^{(U.S.)}_{RUS,t}$ 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 $\Phi^{(U.S.)}_{RUS,t}$. The nationality-basis $\Phi^{(U.S.)}_{RUS,t}$ 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 8. 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 $\phi^{(U.S.)}_{RUS,t}$ are also of interest: U.S. control over Russian claims

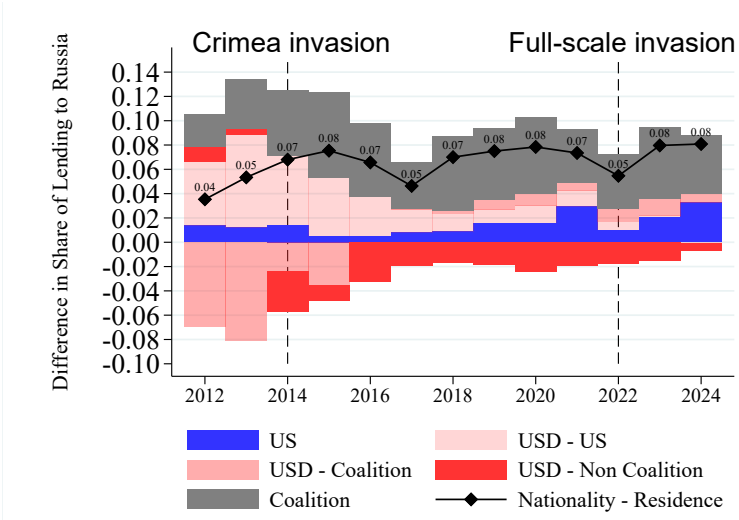


Figure 12: Difference between Nationality and Residence-basis Share of Controlled Claims.

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.

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 8. 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.

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.

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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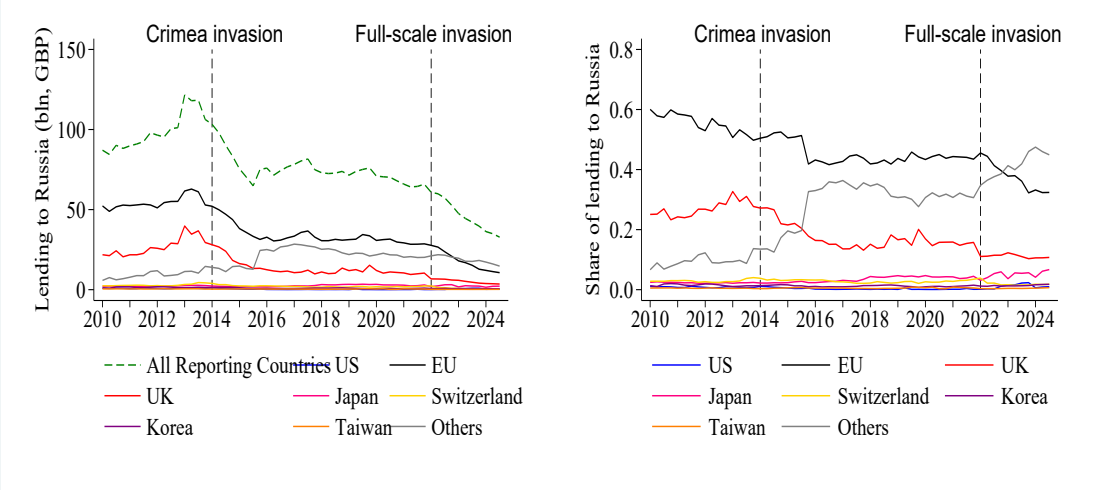
Appendix

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

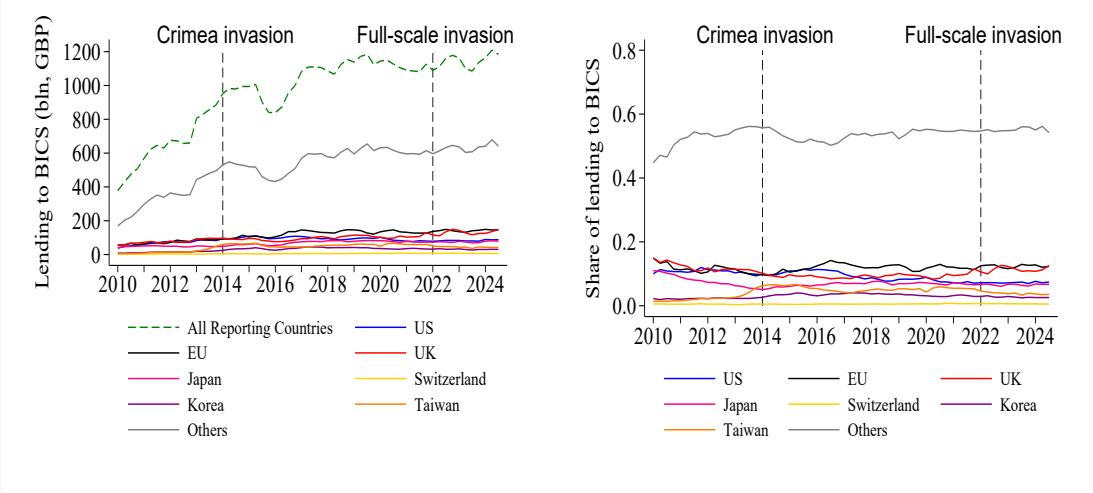


(a) Lending to Russia (b) Residence composition

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.

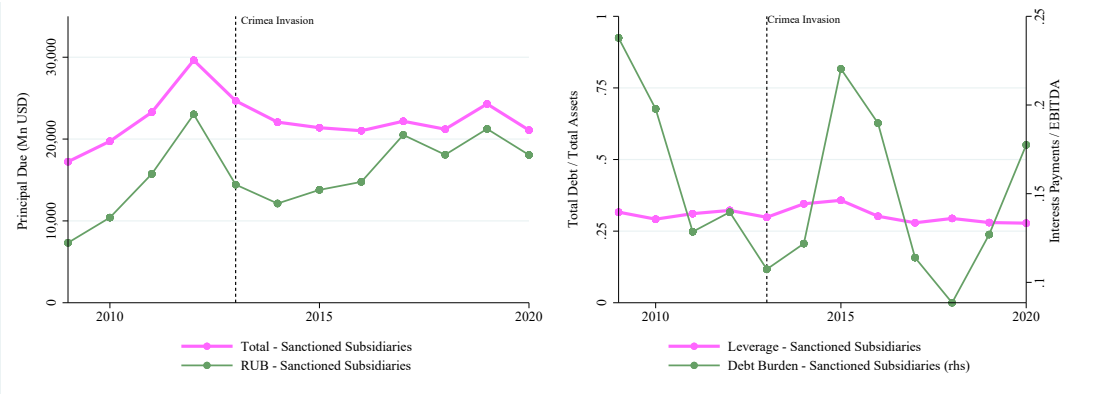
Source: BIS locational banking dataset.

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)	–	✓

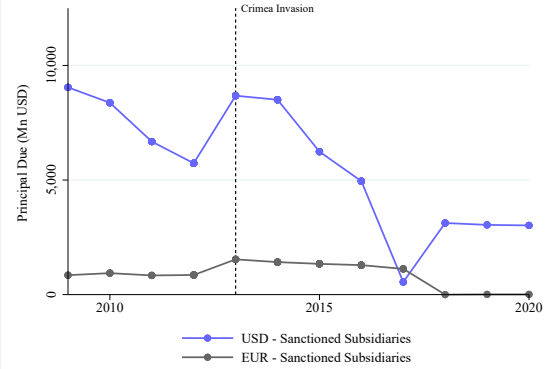
The table reports the list of operating companies designated by the U.S. and EU sectoral sanctions lists in 2014, as well as subsidiaries when the operating parent is not designated itself (i.e. Gazprom Neft and, for the EU only, three Rostec's subsidiaries). Source: OFAC and European Commission.

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: Russian Sanctions and Firm-level Leverage and Debt Burden - All Firms

	(1)	(2)	(3)	(4)
Post × Russia	-0.541***	-0.0193	-0.488***	-0.453***
	(0.0951)	(0.0172)	(0.115)	(0.120)
Post × Russia × Sanctioned	0.0998	-0.0399***	0.914***	0.603***
	(0.0656)	(0.0138)	(0.0618)	(0.0765)
Estimator	OLS	OLS	OLS	OLS
Dependent Variable	Total Debt	Leverage	Interest Expenses	Debt Burden
Observations	8,722	8,726	7,385	7,171
R-squared	0.924	0.911	0.879	0.805

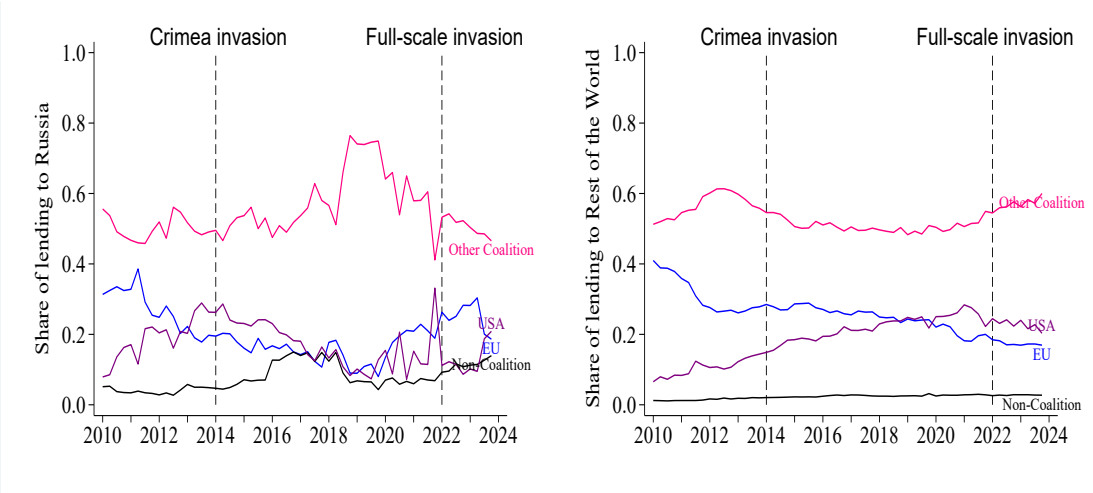
Estimating sample include all firms with more than 1bn USD denominated debt in 2013. Firm and Sector-Time fixed-effects included in all specifications. Standard errors clustered by country. Significance: *** p < 0.01, ** p < 0.05, * p < 0.10.

Table B.3: Russian Sanctions and Firm's Debt Currency Composition - All Firms

	(1)	(2)	(3)	(4)
Post × Russia	-0.767***	0.359*	-0.104***	0.0493**
	(0.0968)	(0.192)	(0.0287)	(0.0218)
Post × Russia × Sanctioned	-0.0495*	-0.0738	0.0322	0.0209
	(0.0281)	(0.0787)	(0.0234)	(0.0342)
Currency	USD	EUR	USD	EUR
Estimator	PPML	PPML	OLS	OLS
Dependent Variable	Total Debt	Total Debt	Currency Share	Currency Share
Observations	8,925	2,033	8,925	2,196
R-squared	0.991	0.983	0.930	0.937

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

C Appendix to the UK Resident Bank-level Empirical Analysis



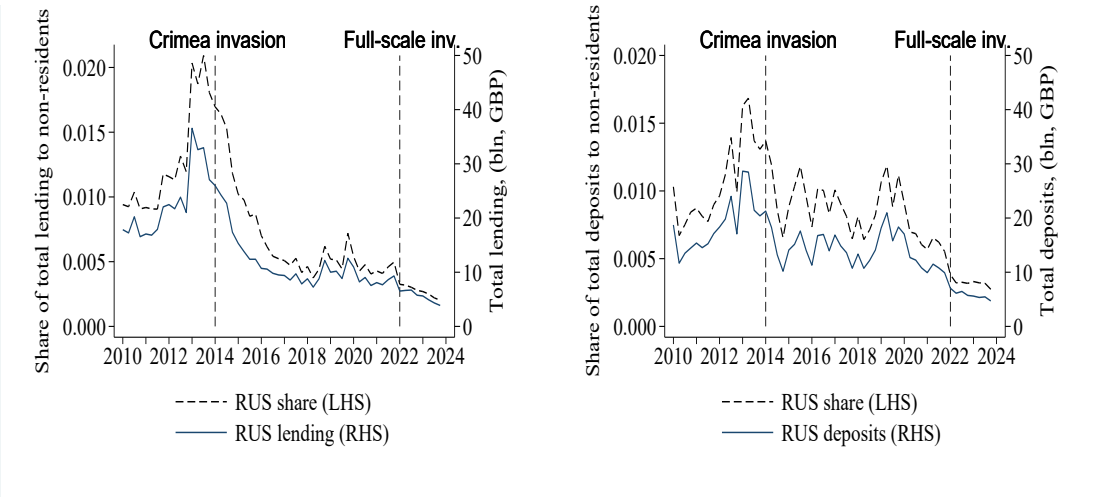
(a) Russia

(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.



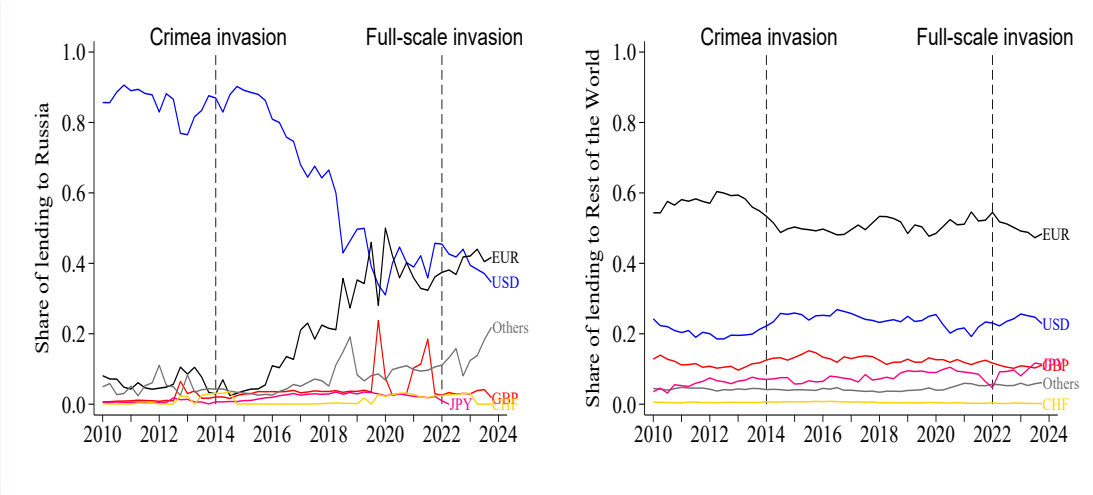
(a) Lending to Russia.

(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.



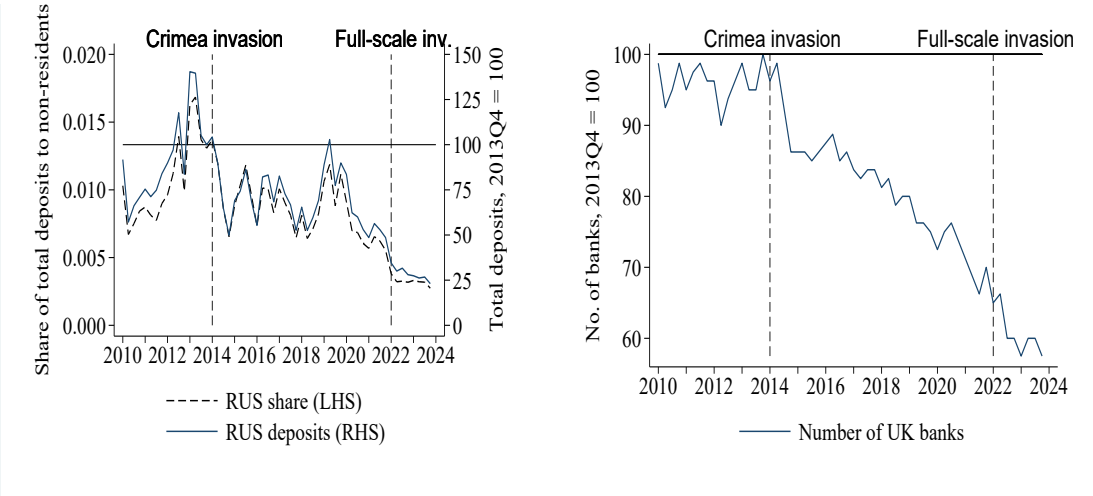
(a) Russia

(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.

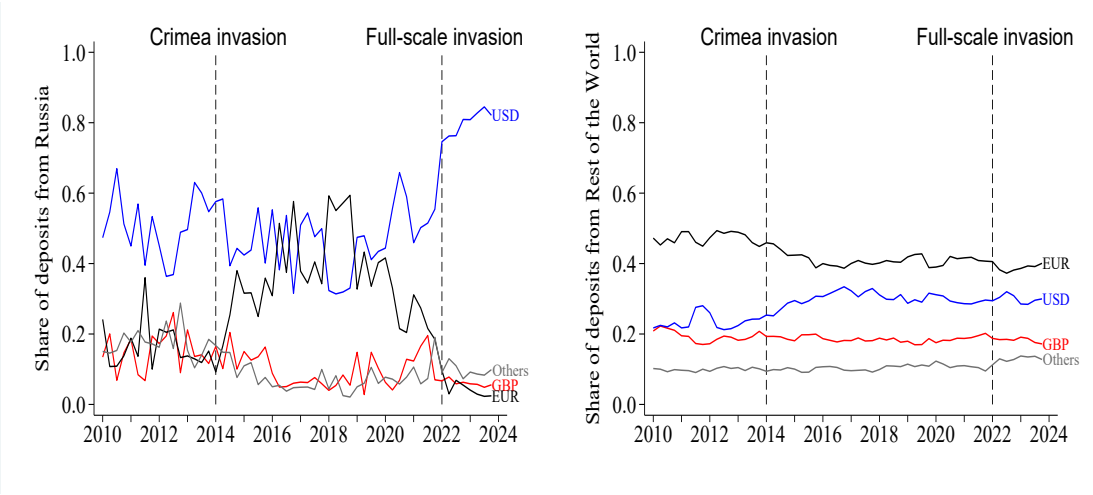


(a) Deposits from Russia. (b) Banks taking deposits from Russia.

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.

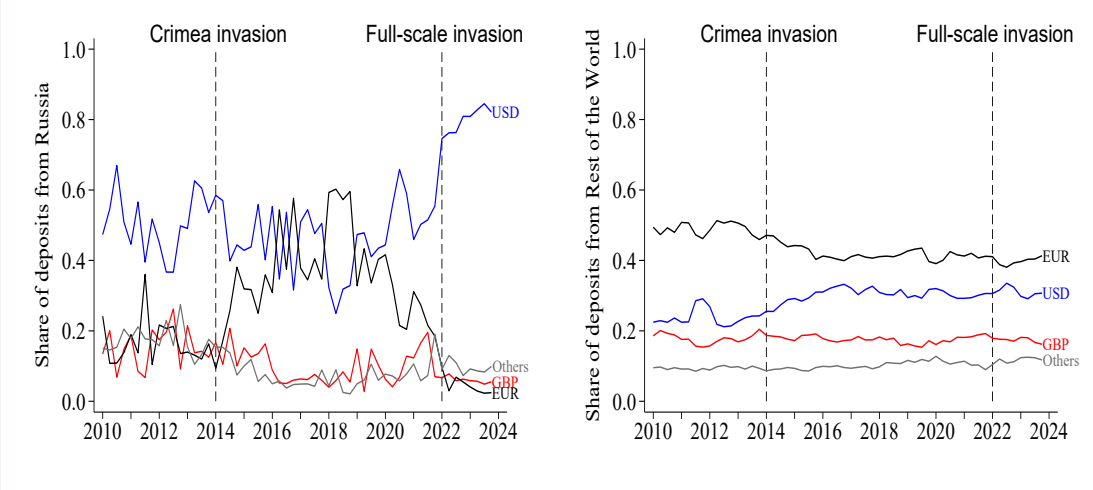


(a) Russia (b) Rest of the World

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

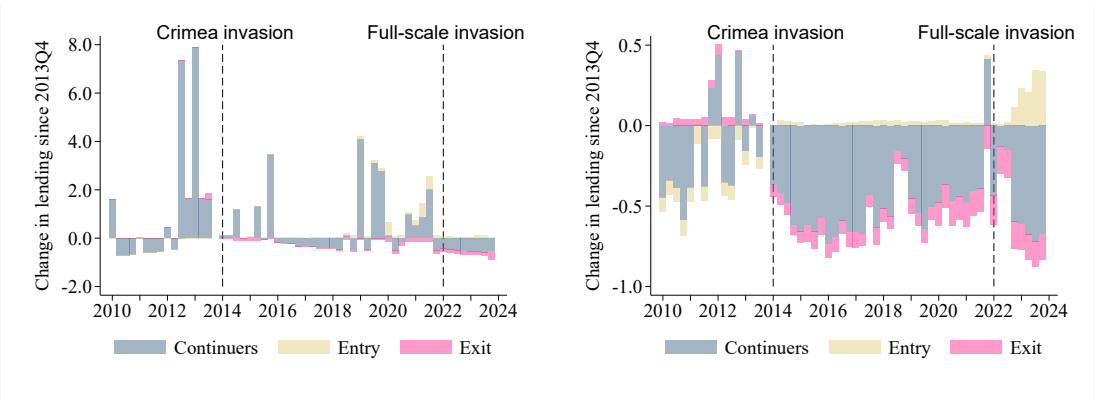
(c) BICS

(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.

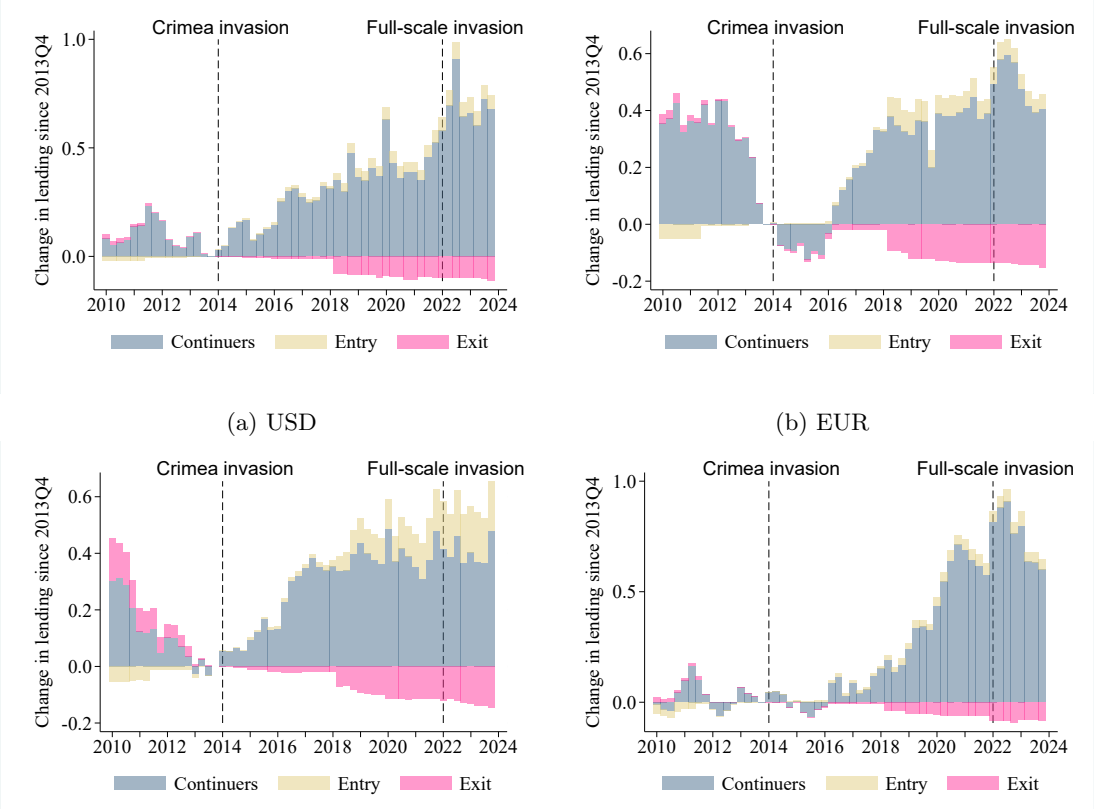


(a) GBP (b) Others

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.4: Triple Interactions - Claims on Russia

	(1)	(2)	(3)
	Baseline	× *EU Banks*	× *JP-CH Banks*
EUR × Post	2.014***	2.014***	2.014***
	(0.643)	(0.643)	(0.644)
OTH × Post	-0.827*	-0.827*	-0.827*
	(0.501)	(0.501)	(0.501)
GBP × Post	0.252	0.252	0.252
	(0.473)	(0.473)	(0.473)
CHF × Post	-7.938***	-7.938***	-7.938***
	(1.040)	(1.042)	(1.044)
JPY × Post	1.350**	0.0177	1.962***
	(0.541)	(0.775)	(0.298)
All Coalition Banks × Post	-0.584**	-0.491	-0.628**
	(0.289)	(0.307)	(0.313)
Additional Bank Jurisdiction Interaction × Post		-0.174	0.203
		(0.328)	(0.256)
EUR × Post × All Coalition Banks	-0.739	-0.337	-0.966
	(0.696)	(0.866)	(0.695)
EUR × Post × Additional Bank Jurisdiction Interaction		-0.659	0.642
		(0.652)	(0.711)
OTH × Post × All Coalition Banks	1.186**	1.898***	0.759
	(0.583)	(0.635)	(0.565)
OTH × Post × Additional Bank Jurisdiction Interaction		-1.411***	1.273***
		(0.412)	(0.398)
GBP × Post × All Coalition Banks	0.365	1.377**	0.249
	(0.607)	(0.586)	(0.634)
GBP × Post × Additional Bank Jurisdiction Interaction		-1.191**	1.049*
		(0.525)	(0.539)
CHF × Post × All Coalition Banks	8.753***	8.676***	8.258***
	(1.188)	(1.163)	(1.183)
CHF × Post × Additional Bank Jurisdiction Interaction		-0.573	2.109*
		(0.628)	(1.186)
JPY × Post × Additional Bank Jurisdiction Interaction		1.987**	-2.019**
		(0.869)	(0.792)
Observations	15,385	15,385	15,385
Pseudo R^2	0.794	0.798	0.797

PPML estimates on the full sample of claims on Russia for all UK resident banks between Q1 2010 and Q4 2021. The reference currency is the US dollar. The start of the post-treatment period is Q1 2014. Column 1 is the baseline specification of Equation 3. Additional jurisdiction interactions are added in subsequent columns, note that EU banks are all part of the sanctioning coalition. Bank-Currency and Time fixed effects included in all specifications, standard-errors are clustered at bank and time. Currency-Jurisdiction interactions cannot always be estimated for smaller currencies.

Table C.5: Quadruple Interactions - Russian and Global Claims

	(1)	(2)	(3)
	Baseline	× *EU Banks*	× *JP-CH Banks*
EUR × Post × Russia	1.635**	1.634**	1.635**
	(0.680)	(0.664)	(0.672)
OTH × Post × Russia	0.310	0.302	0.306
	(0.247)	(0.287)	(0.266)
GBP × Post × Russia	0.388	0.384	0.386
	(0.347)	(0.366)	(0.372)
CHF × Post × Russia	-7.878***	-7.872***	-7.880***
	(0.330)	(0.342)	(0.301)
JPY × Post × Russia	1.311***	-0.0116	1.774***
	(0.264)	(0.303)	(0.269)
All Coalition Banks × Post × Russia	-0.240**	-0.349**	-0.191
	(0.114)	(0.153)	(0.123)
Additional Bank Jurisdiction Interaction × Post × Russia		0.214	-0.175
		(0.179)	(0.193)
EUR × Post × All Coalition Banks	-0.551	-0.441	-0.561
	(0.463)	(0.505)	(0.459)
EUR × Post × Additional Bank Jurisdiction Interaction		-0.174	0.108
		(0.137)	(0.172)
OTH × Post × All Coalition Banks	0.563**	0.726**	0.572**
	(0.223)	(0.334)	(0.241)
OTH × Post × Additional Bank Jurisdiction Interaction		-0.375	-0.0390
		(0.331)	(0.244)
GBP × Post × All Coalition Banks	-0.515	-0.717	-0.452
	(0.549)	(0.573)	(0.547)
GBP × Post × Additional Bank Jurisdiction Interaction		0.262	-0.574*
		(0.233)	(0.304)
CHF × Post × All Coalition Banks	-0.333	-0.655*	-0.127
	(0.344)	(0.344)	(0.346)
CHF × Post × Additional Bank Jurisdiction Interaction		0.707***	-0.688***
		(0.170)	(0.187)
JPY × Post × All Coalition Banks	0.228	0.189	0.364
	(0.532)	(0.554)	(0.519)
JPY × Post × Additional Bank Jurisdiction Interaction		0.0879	-0.506***
		(0.198)	(0.171)
EUR × Post × All Coalition Banks × Russia	-0.320	-0.0489	-0.524
	(0.731)	(0.751)	(0.738)
EUR × Post × Additional Bank Jurisdiction Interaction × Russia		-0.494**	0.601**
		(0.251)	(0.276)
OTH × Post × All Coalition Banks × Russia	-0.0948	0.510	-0.609**
	(0.211)	(0.443)	(0.269)
OTH × Post × Additional Bank Jurisdiction Interaction × Russia		-1.094***	1.636***
		(0.406)	(0.321)
GBP × Post × All Coalition Banks × Russia	0.0899	1.391**	-0.205
	(0.368)	(0.639)	(0.364)
GBP × Post × Additional Bank Jurisdiction Interaction × Russia		-1.725***	2.024***
		(0.484)	(0.614)
CHF × Post × All Coalition Banks × Russia	8.900***	9.363***	8.194***
	(0.291)	(0.401)	(0.386)
CHF × Post × Additional Bank Jurisdiction Interaction × Russia		-1.979***	2.890***
		(0.370)	(0.753)
JPY × Post × Additional Bank Jurisdiction Interaction × Russia		1.804***	-1.482***
		(0.305)	(0.406)
Observations	1,332,163	1,332,405	1,332,163
Pseudo R^2	0.942	0.942	0.942

PPML estimates on the full sample of global claims for all UK resident banks between Q1 2010 and Q4 2021. The reference currency is the US dollar. The start of the post treatment period is Q1 2014. Column 1 is the baseline specification of Equation 4. Additional interactions are added in subsequent columns, note that EU banks are all part of the sanctioning coalition. Bank-Currency-Destination, Bank-time, Destination-time and Currency-time fixed effects included in all specifications, standard-errors are clustered at the bank, destination and time. Currency-Jurisdiction interactions cannot always be estimated for smaller currencies.

Table C.6: Global Claims Spillovers - Russia-Exposed Coalition Banks

	(1) All Excl. AEs	(2) EMDEs	(3) BICS+	(4) BICS
Post × EUR × Destination	0.516***	0.556**	0.539**	0.712**
	(0.185)	(0.275)	(0.268)	(0.331)
Post × OTH × Destination	-0.0995	-0.118	0.202	0.209
	(0.193)	(0.239)	(0.266)	(0.167)
Post × GBP × Destination	0.230	0.433	-0.0279	0.581
	(0.259)	(0.501)	(0.533)	(0.515)
Post × CHF × Destination	0.277	0.0503	-0.267	-0.0358
	(0.391)	(0.513)	(0.710)	(0.805)
Post × JPY × Destination	-0.512**	-1.470***	-1.091	-1.717***
	(0.252)	(0.395)	(0.663)	(0.655)
Post × Destination × Exposed Coalition Banks	-0.499	-0.518**	-0.594**	-0.752
	(0.365)	(0.234)	(0.275)	(0.491)
Post × EUR × Exposed Coalition Banks	0.148	0.141	0.187	0.192
	(0.200)	(0.196)	(0.199)	(0.198)
Post × OTH × Exposed Coalition Banks	-0.348	-0.430**	-0.179	-0.187
	(0.237)	(0.209)	(0.275)	(0.264)
Post × GBP × Exposed Coalition Banks	0.592**	0.588*	0.460*	0.468*
	(0.301)	(0.304)	(0.273)	(0.272)
Post × CHF × Exposed Coalition Banks	-0.0768	-0.107	-0.00378	0.00308
	(0.477)	(0.508)	(0.450)	(0.442)
Post × JPY × Exposed Coalition Banks	-0.0888	-0.109	0.0342	0.0420
	(0.442)	(0.448)	(0.424)	(0.424)
Post × EUR × Destination × Exp. Coal. Banks	-0.105	-0.135	0.199	0.505
	(0.490)	(0.369)	(0.440)	(0.730)
Post × OTH × Destination × Exp. Coal. Banks	1.418**	1.145***	1.054	1.480*
	(0.555)	(0.421)	(0.766)	(0.891)
Post × GBP × Destination × Exp. Coal. Banks	-0.297	-0.0986	0.475	0.982
	(0.527)	(0.630)	(0.466)	(0.662)
Post × CHF × Destination × Exp. Coal. Banks	0.109	0.754	1.302	-1.780
	(0.916)	(0.728)	(1.473)	(1.352)
Post × JPY × Destination × Exp. Coal. Banks	0.310	1.479**	2.493***	3.245***
	(0.525)	(0.706)	(0.787)	(0.780)

PPML estimates of Equation 5 on the full sample of UK resident bank cross-border claims between Q1 2010 and Q4 2021, excluding claims on Russia. The reference currency is the US dollar. The start of the post treatment period is Q1 2014. This tables provides spillovers estimates for banks exposed to Russia in Q4 2013 whose parent was based in a sanctioning coalition jurisdiction. Each column provides estimates of spillovers vs. a different group of countries ("Destination"), relative to all other countries. Column (1) defines "Destination" as all non-advanced, non-EU economies, Column (2) as Emerging Markets and Developing Economies excluding Least Industrialised Countries (IMF definition), Column (3) as all the countries that have joined the BRICS organisation as of 2025, excluding Russia, and Column (4) as the original non-Russia BRICS countries. Bank-Currency-Destination, Bank-time, Destination-time and Currency-time fixed effects included in all specifications, standard-errors are clustered at bank, destination and time. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

Table C.7: Global Claims Spillovers — Russia-Exposed Banks

	(1) All Excl. AEs	(2) EMDEs	(3) BRICS+	(4) BRICS
Post × EUR × Destination	0.492***	0.478**	0.630**	0.785**
	(0.157)	(0.194)	(0.300)	(0.369)
Post × OTH × Destination	-0.0910	-0.122	0.205	0.184
	(0.187)	(0.233)	(0.255)	(0.168)
Post × GBP × Destination	0.151	0.113	0.552	0.650
	(0.203)	(0.260)	(0.426)	(0.557)
Post × CHF × Destination	0.170	-0.667	-1.049**	-0.798
	(0.414)	(0.457)	(0.516)	(0.658)
Post × JPY × Destination	-0.503*	-1.514***	-1.103*	-1.670***
	(0.259)	(0.373)	(0.575)	(0.607)
Post × Destination × Russia-Exposed Banks	-0.354	-0.307	-0.202	-0.206
	(0.287)	(0.225)	(0.192)	(0.257)
Post × EUR × Russia-Exposed Banks	0.202	0.176	0.248	0.249
	(0.192)	(0.193)	(0.188)	(0.185)
Post × OTH × Russia-Exposed Banks	-0.338	-0.442**	-0.220	-0.240
	(0.231)	(0.201)	(0.254)	(0.240)
Post × GBP × Russia-Exposed Banks	0.616**	0.595**	0.550**	0.525**
	(0.301)	(0.302)	(0.262)	(0.261)
Post × CHF × Russia-Exposed Banks	-0.0434	-0.0893	0.0418	0.0446
	(0.468)	(0.506)	(0.435)	(0.434)
Post × JPY × Russia-Exposed Banks	-0.0400	-0.0856	0.0564	0.0607
	(0.434)	(0.441)	(0.417)	(0.414)
Post × EUR × Destination × Russia-Exposed Banks	-0.0807	0.0969	-0.491	-0.444
	(0.438)	(0.556)	(0.338)	(0.537)
Post × OTH × Destination × Russia-Exposed Banks	0.520	0.404	0.227	0.586
	(0.459)	(0.416)	(0.672)	(0.768)
Post × GBP × Destination × Russia-Exposed Banks	-0.220	0.213	-1.355***	-0.153
	(0.485)	(0.840)	(0.390)	(0.486)
Post × CHF × Destination × Russia-Exposed Banks	0.658	1.677*	2.014	1.835
	(0.871)	(0.870)	(1.276)	(1.407)
Post × JPY × Destination × Russia-Exposed Banks	-0.00624	0.808	0.661	-0.0859
	(0.451)	(0.533)	(0.600)	(0.745)

PPML estimates of Equation 5 on the full sample of UK resident bank cross-border claims between Q1 2010 and Q4 2021, excluding claims on Russia. The reference currency is the US dollar. The start of the post treatment period is Q1 2014. This tables provides spillovers estimates for banks exposed to Russia in Q4 2013, regardless of their ultimate jurisdiction. Each column provides estimates of spillovers vs. a different group of countries ("Destination"), relative to all other countries. Column (1) defines "Destination" as all non-advanced, non-EU economies, Column (2) as Emerging Markets and Developing Economies excluding Least Industrialised Countries (IMF definition), Column (3) as all the countries that have joined the BRICS organisation as of 2025, excluding Russia, and Column (4) as the original non-Russia BRICS countries. Bank-Currency-Destination, Bank-time, Destination-time and Currency-time fixed effects included in all specifications, standard-errors are clustered at bank, destination and time. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

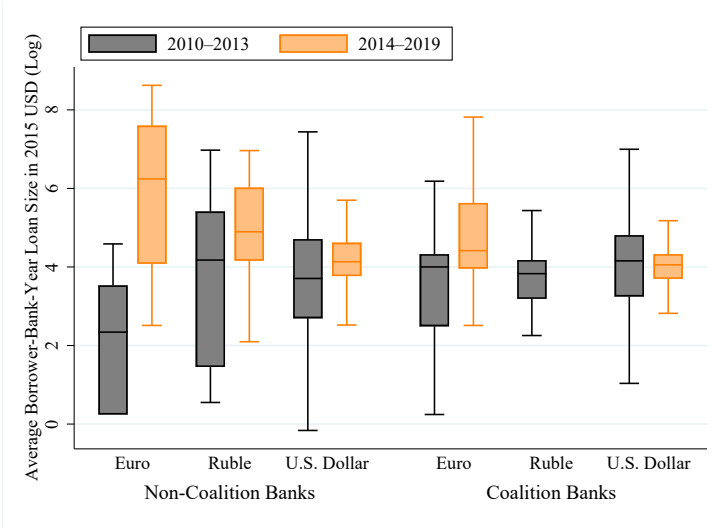
Table C.8: Global Claims Spillovers – Sanctioning Coalition Banks

	(1) All Excl. AEs	(2) EMDEs	(3) BRICS+	(4) BRICS
Post × EUR × Destination	0.326	0.567	-0.210	-0.004
	(0.792)	(0.879)	(0.542)	(0.563)
Post × OTH × Destination	-0.553	-0.516	-0.109	0.084
	(0.339)	(0.351)	(0.403)	(0.432)
Post × GBP × Destination	0.365	0.681	-1.525***	-0.264
	(0.696)	(1.004)	(0.430)	(0.777)
Post × CHF × Destination	0.870	1.606**	0.656	0.784
	(0.885)	(0.688)	(1.052)	(1.104)
Post × JPY × Destination	-1.846***	-1.892***	-1.504	-3.871***
	(0.539)	(0.599)	(0.920)	(0.766)
Post × Destination × Sanctioning Coalition Bank	-0.282	-0.168	-0.141	-0.146
	(0.220)	(0.220)	(0.164)	(0.219)
Post × EUR × Sanctioning Coalition Bank	-0.570	-0.443	-0.553	-0.549
	(0.514)	(0.473)	(0.491)	(0.491)
Post × OTH × Sanctioning Coalition Bank	0.134	0.149	0.438	0.539
	(0.348)	(0.323)	(0.383)	(0.374)
Post × GBP × Sanctioning Coalition Bank	-0.171	-0.115	-0.710	-0.528
	(0.290)	(0.281)	(0.538)	(0.569)
Post × CHF × Sanctioning Coalition Bank	-0.142	-0.0668	-0.292	-0.267
	(0.326)	(0.311)	(0.341)	(0.337)
Post × JPY × Sanctioning Coalition Bank	-0.574	-0.464	-0.170	-0.267
	(0.427)	(0.442)	(0.399)	(0.452)
Post × EUR × Destination × Sanct. Coal. Bank	0.118	-0.136	0.789	0.768
	(0.786)	(0.835)	(0.508)	(0.557)
Post × OTH × Destination × Sanct. Coal. Bank	0.706**	0.636**	0.580	0.440
	(0.341)	(0.315)	(0.383)	(0.444)
Post × GBP × Destination × Sanct. Coal. Bank	-0.391	-0.647	1.927***	0.919
	(0.691)	(1.004)	(0.436)	(0.681)
Post × CHF × Destination × Sanct. Coal. Bank	-0.652	-1.929***	-1.624	-1.534
	(1.000)	(0.749)	(1.235)	(1.332)
Post × JPY × Destination × Sanct. Coal. Bank	1.413***	0.521*	0.574	2.390***
	(0.437)	(0.299)	(0.450)	(0.610)
Observations	1,313,191	1,166,551	1,302,742	1,313,191
Pseudo R^2	0.942	0.945	0.942	0.942

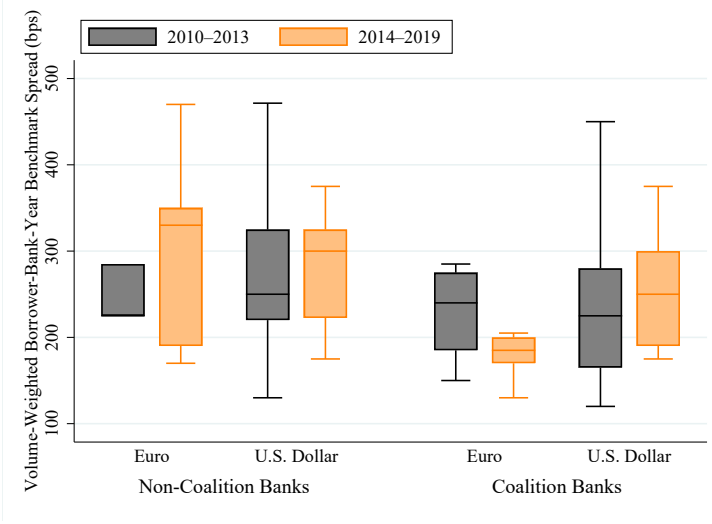
PPML estimates of Equation 5 on the full sample of UK resident bank cross-border claims between Q1 2010 and Q4 2021, excluding claims on Russia. The reference currency is the US dollar. The start of the post treatment period is Q1 2014. This tables provides spillovers estimates for all banks whose parent was based in a sanctioning coalition jurisdiction, regardless of Russia exposure at 2013 Q4. Each column provides estimates of spillovers vs. a different group of countries ("Destination"), relative to all other countries. Column (1) defines "Destination" as all non-advanced, non-EU economies, Column (2) as Emerging Markets and Developing Economies excluding Least Industrialised Countries (IMF definition), Column (3) as all the countries that have joined the BRICS organisation as of 2025, excluding Russia, and Column (4) as the original non-Russia BRICS countries. Bank-Currency-Destination, Bank-time, Destination-time and Currency-time fixed effects included in all specifications, standard-errors are clustered at bank, destination and time. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

D Appendix to the Syndicated Loan Empirical Analysis

D.1 Stylised Facts



(a) Average Loan Size



(b) Average Loan Spread

Figure D.12: Russian Syndicated Loans Size and Spread by Currency and 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.

D.2 Empirical Evidence on the Full Loan Quantity Sample

Table D.9: Loan Quantities and Sanctions — Russia Only Sample - Extensive and Intensive Margins

	(1)	(2)	(3)	(4)	(5)	(6)
Post × EUR	2.988***	3.047***	3.474***	2.746***	3.132***	3.478***
	(0.499)	(0.486)	(0.635)	(0.455)	(0.676)	(0.782)
Post × RUB	0.495	0.403	2.609***	0.834	2.288***	2.311***
	(0.747)	(0.756)	(0.516)	(0.741)	(0.505)	(0.738)
Post × Coalition	-0.740	-0.938*	-0.168			
	(0.551)	(0.548)	(0.327)			
Borrowers	203	203	149	200	141	63
Lenders	304	304	261	170	152	105
Pseudo R^2	0.380	0.424	0.623	0.509	0.698	0.780
Obs	18,610	18,610	5,553	11,310	3,828	3,100
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				✓
Borrower-Year FE			✓		✓	✓
lLender-Year FE				✓	✓	✓
Currency FE	✓	✓	✓	✓	✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
PPML level estimates on the level of loan quantity.

Table D.10: Loan Quantities and Sanctions — Russia Only Sample - Intensive Margin Only

	(1)	(2)	(3)	(4)	(5)	(6)
Post × EUR	0.972***	0.966***	1.137***	1.155***	1.231***	1.238***
	(0.273)	(0.284)	(0.307)	(0.285)	(0.337)	(0.364)
Post × RUB	1.310***	1.073***	1.153***	1.547***	1.176***	1.378***
	(0.349)	(0.278)	(0.360)	(0.416)	(0.334)	(0.395)
Post × Coalition	0.216	0.943**	0.0743			
	(0.134)	(0.465)	(0.109)			
Borrowers	150	56	147	138	135	46
Lenders	173	112	172	132	132	81
Adj. R^2	0.798	0.723	0.883	0.790	0.875	0.519
Obs	2,091	1,026	2,062	1,813	1,784	771
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				✓
Borrower-Year FE			✓		✓	✓
Lender-Year FE				✓	✓	✓
Currency FE	✓	✓	✓	✓	✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
OLS estimate on the log of loan quantity.

Table D.11: Loan Quantities and Sanctions — Russia and EM Sample - Intensive and Extensive Margin

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Russia	-1.349***	-1.294**		-1.133***				
	(0.519)	(0.512)		(0.352)				
Post × EUR	0.238	0.243	0.162	0.117	0.199	0.231		
	(0.162)	(0.162)	(0.187)	(0.166)	(0.176)	(0.193)		
EUR × Russia	-2.361***	-2.525***	-2.303***	-2.266***	-2.209***	-2.226***	-1.829***	-2.235***
	(0.554)	(0.536)	(0.495)	(0.463)	(0.434)	(0.423)	(0.346)	(0.437)
Post × EUR x Russia	2.775***	2.800***	3.345***	2.805***	3.075***	3.169***	2.292***	2.205***
	(0.532)	(0.526)	(0.684)	(0.490)	(0.666)	(0.783)	(0.567)	(0.723)
Post × Coalition	-0.231*	-0.234*	-0.128					
	(0.121)	(0.121)	(0.0975)					
Coalition x Russia	0.295		0.233	0.312	0.763**		0.973***	
	(0.321)		(0.343)	(0.323)	(0.350)		(0.369)	
Post x Coalition x Russia	-0.534	-0.634	-0.212	-0.653	-1.308***	-1.601**	-0.984**	-1.464**
	(0.583)	(0.574)	(0.391)	(0.454)	(0.452)	(0.637)	(0.418)	(0.616)
Borrowers	3,733	3,733	3,040	3,684	2,940	874	2,923	865
Lenders	2,656	2,656	2,175	1,711	1,471	925	1,380	784
Pseudo R^2	0.287	0.336	0.641	0.392	0.666	0.708	0.682	0.725
Obs	314,760	314,760	95,412	242,413	76,668	60,919	73,350	57,581
Borrower FE	✓			✓				
Lender FE	✓		✓					
Year FE	✓	✓						
Borrower-Lender FE		✓				✓		✓
Borrower-Year FE			✓		✓	✓	✓	✓
Lender-Year FE				✓	✓	✓		
Currency FE	✓	✓	✓	✓	✓	✓		
Lender-Currency-Year FE							✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

PPML level estimates on the level of loan quantity.

Table D.12: Loan Quantities and Sanctions — Russia and EM Sample - Intensive Margin Only

	(1)	(2)	(3)	(4)	(5)	(6)	(8)	(8)
Post × Russia	-0.394***	-1.310***		-0.347**				
	(0.148)	(0.383)		(0.137)				
Post × EUR	0.0816	0.105	0.145	0.0789	0.142	0.137		
	(0.0997)	(0.107)	(0.131)	(0.107)	(0.133)	(0.137)		
EUR × Russia	-1.175***	-1.184***	-1.147***	-1.219***	-1.142***	-1.127***	-0.997***	-1.205***
	(0.220)	(0.224)	(0.216)	(0.222)	(0.227)	(0.240)	(0.254)	(0.293)
Post × EUR x Russia	0.765***	0.794***	0.983***	0.850***	1.028***	1.088***	0.784**	1.085***
	(0.296)	(0.305)	(0.330)	(0.295)	(0.342)	(0.371)	(0.356)	(0.405)
Post × Coalition	-0.0636**	-0.0936	-0.0287					
	(0.0301)	(0.0584)	(0.0220)					
Coalition x Russia	-0.168**		-0.138**	-0.199**	-0.110*		-0.117*	
	(0.0846)		(0.0656)	(0.0799)	(0.0566)		(0.0674)	
Post x Coalition x Russia	0.233**	1.073***	0.0935	0.177*	0.0762	0.575***	0.167*	0.538***
	(0.117)	(0.401)	(0.100)	(0.106)	(0.0897)	(0.0419)	(0.0948)	(0.192)
Borrowers	3,049	764	3,024	2,893	2,863	496	2,839	480
Lenders	1,722	925	1,716	1,313	1,307	598	1,190	357
Adj. R^2	0.755	0.670	0.841	0.755	0.839	0.674	0.856	0.772
Obs	38,118	16,330	37,872	34,958	34,644	13,668	33,344	12,226
Borrower FE	✓			✓				
Lender FE	✓		✓					
Year FE	✓	✓						
Borrower-Lender FE		✓				✓		✓
Borrower-Year FE			✓		✓	✓	✓	✓
Lender-Year FE				✓	✓	✓		
Currency FE	✓	✓	✓	✓	✓	✓		
Lender-Currency-Year FE							✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

OLS estimates on the log of loan quantity.

D.3 Empirical Evidence on the Loan Sample with Observed Prices

Table D.13: Loan Quantities and Sanctions — Russia Only Sample with Observed Prices - Extensive and Intensive Margins

	(1)	(2)	(3)	(4)	(5)	(6)
Post × EUR	1.668***	1.452***	1.511***	1.762***	1.350***	1.371***
	(0.356)	(0.266)	(0.285)	(0.276)	(0.263)	(0.235)
Post × Coalition	0.637	1.411*	-0.135			
	(0.480)	(0.750)	(0.262)			
Borrowers	65	30	65	61	61	24
Lenders	111	75	111	90	89	55
Pseudo R^2	0.827	0.856	0.890	0.862	0.916	0.943
Obs	1,105	505	1,100	930	920	350
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				✓
Borrower-Year FE			✓		✓	✓
Lender-Year FE				✓	✓	✓
Currency FE	✓	✓	✓	✓	✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
PPML level estimates on the level of loan quantity.

Table D.14: Loan Quantities and Sanctions — Russia Only Sample with Observed Prices - Intensive Margin Only

	(1)	(2)	(3)	(4)	(5)	(6)
Post × EUR	1.306***	1.190***	1.093***	1.311***	1.014***	0.988***
	(0.247)	(0.220)	(0.205)	(0.251)	(0.218)	(0.230)
Post × Coalition	0.179	0.749	-0.0564			
	(0.245)	(1.225)	(0.128)			
Borrowers	65	30	65	61	61	24
Lenders	111	75	111	90	89	55
Adj. R^2	0.837	0.793	0.905	0.836	0.911	0.242
Obs	1,105	505	1,100	930	920	350
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				✓
Borrower-Year FE			✓		✓	✓
Lender-Year FE				✓	✓	✓
Currency FE	✓	✓	✓	✓	✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
OLS estimate on the log of loan quantity.

Table D.15: Loan Prices and Sanctions — Russia Only Sample - Spread level

	(1)	(2)	(3)	(4)	(5)	(6)
Post × EUR	-60.48***	-49.52***	-52.32***	-49.74***	-44.97***	-40.50***
	(17.49)	(11.83)	(14.90)	(14.06)	(12.56)	(11.51)
Post × Coalition	18.24	118.0***	-0.310			
	(14.91)	(29.92)	(4.095)			
Borrowers	65	30	65	61	61	24
Lenders	111	75	111	90	89	55
Adj. R^2	0.875	0.757	0.985	0.893	0.988	0.725
Obs	1,105	505	1,100	930	920	350
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				✓
Borrower-Year FE			✓		✓	✓
Lender-Year FE				✓	✓	✓
Currency FE	✓	✓	✓	✓	✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
OLS estimate on the level of spread over risk free benchmark.

Table D.16: Loan Prices and Sanctions — Russia Only Sample - Log of Spread

	(1)	(2)	(3)	(4)	(5)	(6)
Post × EUR	-0.303***	-0.252***	-0.242***	-0.253***	-0.211***	-0.193***
	(0.0725)	(0.0511)	(0.0583)	(0.0596)	(0.0493)	(0.0453)
Post × Coalition	0.0539	0.288**	0.00628			
	(0.0527)	(0.134)	(0.0183)			
Borrowers	65	30	65	61	61	24
Lenders	111	75	111	90	89	55
Adj. R^2	0.850	0.725	0.978	0.873	0.981	0.697
Obs	1,105	505	1,100	930	920	350
Borrower FE	✓			✓		
Lender FE	✓		✓			
Year FE	✓	✓				
Borrower-Lender FE		✓				✓
Borrower-Year FE			✓		✓	✓
Lender-Year FE				✓	✓	✓
Currency FE	✓	✓	✓	✓	✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
OLS estimate on the log of spread over risk free benchmark.

Table D.17: Loan Quantities and Sanctions — Russia and EM Sample with Observed Prices - Intensive and Extensive Margin

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Russia	-0.791	-2.476***		-0.567				
	(0.592)	(0.735)		(0.436)				
Post × EUR	-0.0721	-0.0363	0.368**	-0.00599	0.296*	0.287		
	(0.115)	(0.127)	(0.165)	(0.116)	(0.166)	(0.185)		
EUR × Russia	-1.890***	-1.831***	-1.648***	-1.791***	-1.554***	-1.600***	-1.002***	-1.013***
	(0.277)	(0.229)	(0.318)	(0.255)	(0.306)	(0.280)	(0.162)	(0.267)
Post × EUR x Russia	2.012***	1.365***	1.154***	1.903***	1.139***	1.102***	0.569***	0.562*
	(0.398)	(0.375)	(0.354)	(0.347)	(0.334)	(0.305)	(0.179)	(0.291)
Post × Coalition	0.0125	0.0253	-0.0372					
	(0.0503)	(0.114)	(0.0454)					
Coalition x Russia	-0.309		0.0911	-0.178	0.129		0.120	
	(0.325)		(0.197)	(0.273)	(0.145)		(0.158)	
Post x Coalition x Russia	0.246	2.021***	-0.389	0.0569	-0.474	0.373***	0.197	0.179*
	(0.512)	(0.741)	(0.361)	(0.457)	(0.396)	(0.137)	(0.256)	(0.105)
Borrowers	1,264	355	1,259	1,213	1,206	262	1,195	259
Lenders	1,213	694	1,208	939	938	485	826	280
Pseudo R^2	0.776	0.798	0.846	0.809	0.867	0.887	0.869	0.909
Obs	22,847	10,448	22,772	20,818	20,734	9,014	19,728	7,849
Borrower FE	✓			✓				
Lender FE	✓		✓					
Year FE	✓	✓						
Borrower-Lender FE		✓				✓		✓
Borrower-Year FE			✓		✓	✓	✓	✓
Lender-Year FE				✓	✓	✓		
Currency FE	✓	✓	✓	✓	✓	✓		
Lender-Currency-Year FE							✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

PPML level estimates on loan quantity.

Table D.18: Loan Quantities and Sanctions — Russia and EM Sample with Observed Prices - Intensive Margin Only

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Russia	-0.332*	-1.191		-0.372**				
	(0.182)	(1.153)		(0.153)				
Post × EUR	0.126	0.188	0.264*	0.161	0.260	0.253		
	(0.116)	(0.128)	(0.158)	(0.126)	(0.160)	(0.167)		
EUR × Russia	-1.620***	-1.542***	-1.325***	-1.614***	-1.324***	-1.277***	-1.163***	-1.320***
	(0.269)	(0.233)	(0.204)	(0.256)	(0.196)	(0.210)	(0.227)	(0.335)
Post × EUR x Russia	1.147***	0.946***	0.791***	1.162***	0.838***	0.751***	0.753***	0.875**
	(0.325)	(0.294)	(0.259)	(0.305)	(0.258)	(0.275)	(0.243)	(0.353)
Post × Coalition	-0.0544	-0.0908	-0.0288					
	(0.0381)	(0.0754)	(0.0265)					
Coalition x Russia	-0.112		-0.0412	-0.175**	-0.0845		-0.0803	
	(0.0883)		(0.0574)	(0.0776)	(0.0700)		(0.0861)	
Post x Coalition x Russia	0.268*	1.122	0.0638	0.337**	0.188	0.196***	0.286	-0.146
	(0.139)	(1.147)	(0.0848)	(0.135)	(0.173)	(0.0380)	(0.179)	(0.0951)
Borrowers	1,264	355	1,259	1,213	1,206	262	1,195	259
Lenders	1,213	694	1,208	939	938	485	826	280
Adj. R^2	0.747	0.640	0.827	0.744	0.821	0.625	0.844	0.746
Obs	22,847	10,448	22,772	20,818	20,734	9014	19,728	7,849
Borrower FE	✓			✓				
Lender FE	✓		✓					
Year FE	✓	✓						
Borrower-Lender FE		✓				✓		✓
Borrower-Year FE			✓		✓	✓	✓	✓
Lender-Year FE				✓	✓	✓		
Currency FE	✓	✓	✓	✓	✓	✓		
Lender-Currency-Year FE							✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

OLS estimates on the log of loan quantity.

Table D.19: Loan Prices and Sanctions — Russia and EM Sample - Spread Level

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Russia	33.05	-167.2***		24.01				
	(25.40)	(11.70)		(20.14)				
Post × EUR	25.83***	7.574	-8.667***	11.82**	-9.216***	-9.855***		
	(7.814)	(5.641)	(2.574)	(5.859)	(2.560)	(2.577)		
EUR × Russia	54.27***	38.47***	18.65**	44.25***	17.37**	11.23**	20.77**	15.31***
	(19.14)	(13.50)	(7.416)	(15.94)	(6.907)	(4.745)	(8.437)	(5.355)
Post × EUR x Russia	-119.6***	-95.92***	-47.01***	-96.98***	-42.82***	-31.40***	-54.65***	-40.02***
	(32.19)	(30.70)	(15.72)	(29.69)	(14.55)	(11.13)	(19.02)	(14.14)
Post × Coalition	19.63***	43.02***	-0.457					
	(3.770)	(8.416)	(0.817)					
Coalition x Russia	6.762		3.844	-6.964	4.346		3.948	
	(7.275)		(2.587)	(7.109)	(2.951)		(2.807)	
Post x Coalition x Russia	-16.85	175.8***	-4.288	-17.95*	-4.403	-5.774*	-0.421	-4.854
	(11.99)	(13.40)	(3.002)	(10.49)	(5.616)	(3.297)	(4.295)	(3.098)
Borrowers	1,253	353	1,248	1,204	1,197	261	1,186	258
Lenders	1,212	694	1,207	939	938	485	826	280
Adj. R^2	0.896	0.793	0.991	0.914	0.991	0.977	0.992	0.980
Obs	22,781	10,434	22,706	20,758	20,674	9,008	19,674	7,843
Borrower FE	✓			✓				
Lender FE	✓		✓					
Year FE	✓	✓						
Borrower-Lender FE		✓				✓		✓
Borrower-Year FE			✓		✓	✓	✓	✓
Lender-Year FE				✓	✓	✓		
Currency FE	✓	✓	✓	✓	✓	✓		
Lender-Currency-Year FE							✓	✓

Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

OLS estimates on the level of spread over benchmark risk free rate.

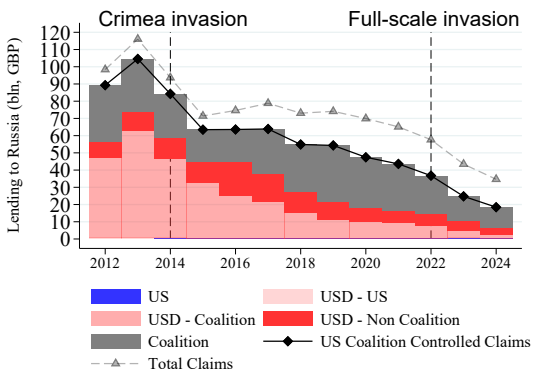
Table D.20: Loan Prices and Sanctions — Russia and EM Sample - Log of Spread

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × Russia	0.134	-0.573***		0.0411				
	(0.105)	(0.0762)		(0.0912)				
Post × EUR	0.180***	0.0570	-0.0660***	0.0717	-0.0706***	-0.0740***		
	(0.0649)	(0.0476)	(0.0230)	(0.0512)	(0.0226)	(0.0224)		
EUR × Russia	0.336***	0.227***	0.0937**	0.253***	0.0860**	0.0585**	0.0970**	0.0783***
	(0.0966)	(0.0672)	(0.0366)	(0.0805)	(0.0340)	(0.0255)	(0.0381)	(0.0265)
Post × EUR x Russia	-0.671***	-0.516***	-0.187***	-0.518***	-0.165***	-0.125***	-0.229**	-0.163**
	(0.170)	(0.164)	(0.0650)	(0.166)	(0.0585)	(0.0480)	(0.0912)	(0.0722)
Post × Coalition	0.137***	0.311***	-0.00388					
	(0.0278)	(0.0632)	(0.00501)					
Coalition x Russia	0.0494		0.0152	-0.0349	0.0184		0.0173	
	(0.0334)		(0.0114)	(0.0374)	(0.0141)		(0.0135)	
Post x Coalition x Russia	-0.105**	0.490***	-0.00801	-0.101	0.0131	-0.0480	0.0285	-0.0501
	(0.0489)	(0.101)	(0.0131)	(0.0660)	(0.0405)	(0.0369)	(0.0396)	(0.0390)
Borrowers	1,253	353	1,248	1,204	1,197	261	1,186	258
Lenders	1,212	694	1,207	939	938	485	826	280
Adj. R^2	0.824	0.717	0.985	0.863	0.984	0.961	0.987	0.970
Obs	22,781	10,434	22,706	20,758	20,674	9,008	19,674	7,843
Borrower FE	✓			✓				
Lender FE	✓		✓					
Year FE	✓	✓						
Borrower-Lender FE		✓				✓		✓
Borrower-Year FE			✓		✓	✓	✓	✓
Lender-Year FE				✓	✓	✓		
Currency FE	✓	✓	✓	✓	✓	✓		
Lender-Currency-Year FE							✓	✓

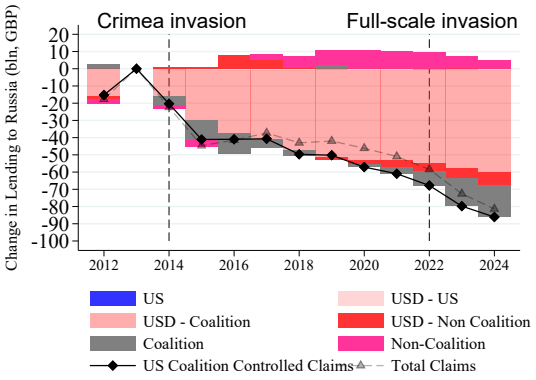
Standard errors clustered at bank and borrower-currency-year. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

OLS estimates on the log of spread over benchmark risk free rate.

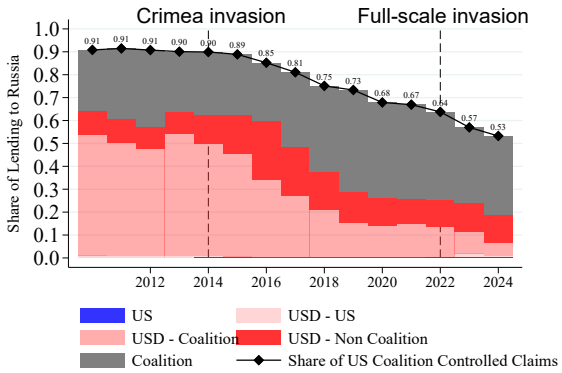
E Appendix to the Capital Flows View of Geo-economic Power



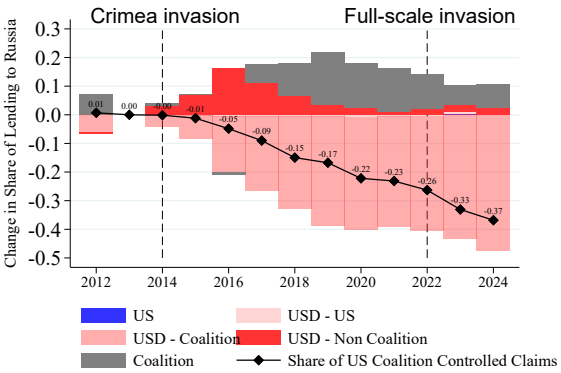
(a) Lending to Russia under U.S. Coalition Control



(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.