Financial Sanctions and Russian Trade *

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Abstract

With highly disaggregated transaction level Russian trade data, we find that while EU and US trade sanctions significantly reduced Russian trade with the West, they are ineffective in reducing its trade with non-Western countries and even induce trade diversion to countries such as China and India. In comparison, financial sanctions - a removal of Russian banks from the SWIFT system and a withdrawal of Western banks from Russia - significantly reduced Russian trade with both Western and non-Western countries. The effects of financial sanctions are more prominent on the extensive margin, causing fewer Russian firms able to trade. However, the effects on Russian trade with non-Western countries are undermined by financial bypassing-specifically, the increased use of non-Western currencies (and potentially banks), particularly the Chinese Renminbi, in such trade.

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1 Introduction

Sanctions are an important ingredient of geoeconomics. The United States and European Union often deploy a combination of financial and trade sanctions. Why is there a need to do both? Are they effective? How do they interact with each other? This paper investigates these questions through a case study of Western sanctions on Russia in the aftermath of the latter's full-scale invasion of Ukraine in February 2022.

There are two primary tools of financial sanctions use in this case: removing Russian banks from the SWIFT system, a bank-to-bank messaging system, and a withdrawal of Western banks from the Russian market. While trade sanctions imposed by EU or the US can constrain the trade between Western firms and Russia, they are not effective in restricting trade between non-Western countries and Russia. Financial sanctions have the potential to mitigate the deficiency of the trade sanctions, but there is a lack of systematic evidence on their efficacy. Our paper aims to fill this void.

Sanctions have become a crucial tool of economic statecraft, allowing countries to exert pressure on targeted nations without direct military confrontation (Clayton, Maggiori and Schreger, 2023, 2024). Following the annexation of Crimea in 2014 and especially after the full-scale invasion of Ukraine in 2022, Western nations implemented a wide array of financial and trade sanctions against Russia. These measures include the removal of key Russian banks from the SWIFT system, withdrawal from Russia market by major Western banks, export controls on critical technologies, import bans on energy products, and price caps on oil and petroleum products etc. The sanctions aim to weaken Russia's ability to sustain its war efforts and disrupt its broader economic activities. This paper provides a comprehensive analysis of these sanctions, examining their effects on Russian imports, exports, and trade relationships, using a detailed transaction-level dataset. The previous literature most studies the impact of trade sanctions (e.g., Kwon, Syropoulos and Yotov (2022), Li et al. (2024), De Souza et al. (2024), Egorov et al. (2025)). We pay special attention to financial sanctions. In particular, we examine why and when financial sanctions are needed when both Russian exporters and importers can be subject to western trade sanctions.

We document that financial sanctions, the exclusion of Russian banks from the SWIFT system and the withdrawal of Western banks, significantly reduced Russian trade flows, independent of trade sanctions. SWIFT sanctions are described as "the financial nuclear weapon" by French Minister of Finance Bruno Le Maire, partly because they have not been deployed against a major economy before. We will document that they have led to a 24.2% reduction in Russian imports from and a 18.9% reduction in its exports to the EU and the US following the first round of SWIFT sanctions. We find even larger effects from the second round of SWIFT sanctions, further reducing

Russian imports and exports by 36.7% and 17.3%, respectively. The withdrawal of Western banks had the most pronounced impact, leading to a 48.8% decline in imports and a 22.5% decline in exports to Western nations. Notably, trade with non-Western countries, was less affected, with some evidence of trade resilience in certain cases.

The financial and trade sanctions reshaped Russia's trade geography through different channels. Under SWIFT sanctions, the exports from European Union and the United States to Russia exhibit a sharp decline on top of the direct effect of the EU and US export controls. For example, following the first-round SWIFT sanctions, the EU exports to Russia fell by 24.0% and the US exports to Russia fell by 53.1%. In comparison, the Chinese exports to Russia decreased modestly (by 4.59%).

On the goods trade in the other direction, we see that the Russia exports to E.U. and U.S. also exhibit a sharp decline following the SWIFT sanctions. Interestingly, Russian exports to major non-Western partners (India, China, Turkey and CIS countries) also declined following the SWIFT sanctions. The effect is big for exports to India, but milder for exports to China, Turkey, and CIS economies.

Western banks are generally not required by their home-country governments to leave Russia. Nonetheless, many of them, though not all, have chosen to exit Russia once the Russian invasion started, due to either a corporate risk calculation, shareholder pressure, Western customer pressure, or a moral decision by the bank executives. Such actions amount to a form of private-sector financial sanctions as they may disrupt the business operation of those Russian exporting or importing firms that used to work with the Western banks. As shown earlier, for many Russian firms, those Western banks used to be the only banks they work with. Therefore, if the cost of switching banks is non-trivial, at least in the short run, the withdrawal of these Western banks has the potential to disrupt Russian trade significantly. Empirically, we see that the withdraw of Western banks has indeed significantly reduced Russian imports from E.U., U.S. and other Western countries. Interestingly, the Western bank withdraw has also reduced significantly the Russian exports to both non-Western and Western economies, reflecting a significant role of the Western banks in mediating Russian exports to most trading partners.

The dynamic analysis demonstrates both immediate and sustained impacts of sanctions on trade. The SWIFT sanctions led to a rapid decline in Russian trade flows. There is also some evidence of an anticipation effect with regard to the second-round SWIFT sanctions on Russia's largest bank, the Sberbank: there is a decline in the activities of the Russian firms associated with the Russian banks before the SWIFT sanctions on the banks were formally implemented. The withdrawal of Western banks had the most persistent and severe impact, disrupting both imports and exports over an extended period. These dynamics highlight the role of financial institutions

as critical facilitators of international trade.

Financial sanctions affect trade more through the extensive margin than the intensive margin. On the extensive margin, the number of Russian firms engaged in international trade declined significantly, particularly those trading with Western partners. The first round of SWIFT sanctions reduced the number of Russian importing firms by 4.49% and export firms by 3.14%, while the second round caused declines of 13.3% and 8.15%, respectively. At the intensive margin (i.e., trade among surviving firms), the sanctions had overall much smaller effects, especially during the second round of SWIFT sanctions.

In specifications in which we include both Western financial and trade sanctions in our analysis, we find that our results on financial sanctions remain robust. In addition, financial and trade sanctions tend to reinforce each other (as the coefficients on the interactions between the two types of sanctions are negative and significant) in Russian trade with Western nations. One possible interpretation is that Western and Russian firms reduce their efforts to avoid trade sanctions (e.g., obtaining an exemption to the trade ban through lobbying domestic politicians) if the financial sanctions are in place, because the payoff to the evasion effort goes down.

We investigate potential channels through which Russian trade with non-Western countries was less affected by financial sanctions. Specifically, we examine the role of an increased use of non-Western currencies such as the Chinese RMB in invoicing and settling trade to substitute for the US dollars or Euros. We find that such financial bypassing indeed reduces the effectiveness of Western financial sanctions. At the same time, we do not find a significant role of increased barter trade between Russian firms and its international partner countries.

Literature Review

This paper contributes to the literature on economic sanctions in two ways. First, unlike much of the existing research that emphasizes macroeconomic or aggregate trade effects, our study delves into micro-level responses and highlights financial sanctions and the interplay between financial and trade sanctions, providing a more granular understanding of their impacts. By integrating multiple strands of literature, we emphasize both the disruptions caused by sanctions and the adaptive strategies adopted by affected firms or banks.

The literature on trade sanctions extensively explores their design, effectiveness, and unintended consequences. For instance, Korovkin and Makarin (2023), Egger, Syropoulos and Yotov (2024), Egorov et al. (2025), and Felbermayr et al. (2025) underscore the dual effects of trade sanctions: direct economic disruption in targeted countries and broader spillovers across global markets. Spiro, Wachtmeister and Gars (2024) conceptualize sanctions as terms-of-trade tools, aiming to maximize costs for targeted states while minimizing losses for sanctioning countries.

Similarly, Kwon, Syropoulos and Yotov (2022) and Fisman, Moustakerski and Wei (2008) document extraterritorial effects, showing how trade reconfigurations among third-party countries often dilute sanctions' effectiveness, with some economies even benefiting. Li et al. (2024) extend this perspective by demonstrating how firms in neutral countries reroute goods to sanctioned states, undermining sanctions' objectives. Our study complements this body of work by focusing on Russia's trade reconfiguration, particularly its pivot toward non-Western partners such as China, India, and Turkey. Unlike prior studies, we quantify the role of partner currencies and barter trade in mitigating the effects of sanctions, offering a deeper understanding of adaptive mechanisms.

Firm-level and supply chain responses to trade sanctions are another well-documented area. Korovkin, Makarin and Miyauchi (2024) analyze the 2014 Russia-Ukraine conflict, showing how firms with disrupted supplier or buyer connections reorganized production networks to substitute partners. Lastauskas, Proškute and Žaldokas (2025) investigate Lithuanian firms' responses to the 2014 Russian trade ban, highlighting the role of intermediaries in redirecting exports to riskier markets and producers' shift toward politically aligned countries. De Souza et al. (2024) emphasize the cost-efficiency of targeting high-export sectors like energy to amplify sanctions' impact. These studies underscore the challenges of designing effective sanctions while minimizing domestic welfare losses. Building on this work, our paper uses Russian transaction-level data to evaluate the effectiveness of a broader range of sanctions, including SWIFT sanctions, Western major banks' winding down from Russia, U.S. and E.U. export controls, import bans, and the removal of MFN status. Unlike previous studies, we assess the combined effects of financial and trade sanctions, revealing their complementary and amplifying dynamics.

The literature on financial sanctions highlights their unique role as tools of economic coercion. Clayton, Maggiori and Schreger (2024) explore how hegemonic powers use financial sanctions to restrict access to global markets, leveraging financial networks to project power. Bianchi and Sosa-Padilla (2023*a*,*b*) discuss how financial sanctions erode the U.S. dollar's reserve currency status and contribute to global financial fragmentation. Efing, Goldbach and Nitsch (2023) and Nigmatulina (2022) examine firm-level impacts, showing how sanctions distort bank capital flows and lead to resource misallocation in sanctioned economies. Itskhoki and Mukhin (2022) complement these findings by analyzing exchange rate dynamics, highlighting how import sanctions appreciate exchange rates while export restrictions cause depreciation. Our study advances this literature by empirically analyzing the effects of SWIFT sanctions and the withdrawal of Western banks, focusing on the extensive and intensive margins of trade. Unlike prior research, we investigate how partner currencies and trade redirection mitigate the impacts of financial sanctions, offering a novel perspective on resilience mechanisms.

The intersection of sanctions and relationship banking is particularly relevant during periods of economic and financial distress. Huber (2018) and Paravisini et al. (2015) emphasize the stabilizing role of strong banking relationships during crises, while Chodorow-Reich (2014) and Amiti and Weinstein (2011) highlight the protective effects of consistent trade finance. Collectively, these studies demonstrate the critical role of relationship banking in mitigating economic shocks. Our paper extends this literature by examining how firm-bank relationships evolve under financial sanctions targeting banks. Specifically, we show how the withdrawal of Western banks disrupted Russian trade, while continued relationships with non-Western financial institutions enabled firms to adapt. This dual focus on disruption and adaptation sets our study apart from earlier work. In synthesizing these strands of literature, our paper bridges the gap between macroeconomic and microeconomic perspectives on sanctions. While previous research has largely treated financial and trade sanctions as separate domains, we demonstrate their interconnected effects and the ways in which firms and economies navigate these challenges. By focusing on firm-level data and adaptive strategies, we provide a nuanced understanding of how sanctions reshape global trade dynamics, contributing both to theoretical discussions and practical policy considerations.

The remainder of the paper is organized as follows. Section 2 discusses institutional background, and Section 3 describes our dataset. Section 4 analyzes the effects of SWIFT sanctions and the withdrawal of major Western banks. Section 5 jointly examines financial sanctions and its interactions with trade sanctions. Section 6 investigates potential factors to mitigate SWIFT sanctions' impacts on Russian trade with non-Western countries. Section 7 concludes.

2 Institutional Background

Since the Russian invasion of Crimea in February, 2014, and its annexation in the following month, the Western world started to impose economic sanctions against Russia. The sanctions were relatively mild compared to what has come after Russia's full-scale invasion of Ukraine since 24 February 2022.

The E.U. first enacted sanction measures in the COUNCIL REGULATION (EU) No 833/2014 of 31 July 2014 concerning restrictive measures in view of Russia's actions destabilising the situation in Ukraine. In the regulation, the E.U. restricted exports of dual-use goods and technology listed in the Common Military List, and certain equipment and technology suited to the oil industry for use in deep water oil exploration and production, Arctic oil exploration and production, or shale oil projects in Russia. These restrictions require relevant EU exporters to obtain export authorisation from the competent authorities (E.U. member states). Restrictions are also imposed on the export of supporting services such as technical assistance (e.g., repairs, development, man-

ufacture, assembly, testing, maintenance or any other technical service), which may take the form of instruction, advice, training, transmission of working knowledge or skills or consulting services; brokering services, financing or financial assistance (e.g., grants, loans and export credit insurance) related to the aforementioned technologies are also restricted.

There are also certain financial sanctions in the regulation that prohibit purchase, sell, provide brokering or assistance in the issuance of, or otherwise deal with transferable securities and money-market instruments with a maturity exceeding 90 days to several Russian banks: Sberbank, VTB Bank, Gazprombank , Vnesheconombank (VEB) and Rosselkhozbank (Russian Agricultural Bank).

The U.S. also implemented export controls against Russia in 2014. In Part 746 of U.S. Export Administration Regulations, Supplement No. 2 (Russian Industry Sector Sanction List) published on August 6th, 2014 imposed restrictions on the exports of goods and technologies that are used for oil exploration and production unless an export license is obtained from the government. Restrictions were also imposed on exports of the dual-use goods and technology as designated by the U.S. Bureau of Industry and Security (BIS) on a Commerce Control List (CCL). Financial sanctions were imposed by the U.S. Department of the Treasury that deny financial services to selected Russian banks, including Bank of Moscow, Gazprombank, Russian Agricultural Bank, Sberbank, VEB, and VTB Bank.

The Western sanctions were significantly strengthened after February 2022. The new measures are designed to weaken Russia's economic base, depriving it of critical technologies and markets and significantly curtailing its ability to wage war. Some of the sanction measures were coordinated between the Western countries, but some were more idiosyncratic. For export controls, the E.U. and U.S. added new product lists related to Russian industrial development and also the luxury goods. Luxury goods sanctions are often aimed at the political and economic elites. These individuals or groups are typically influential and have the means to enjoy and import high-value items. By restricting access to luxury goods, sanctions aim to directly impact those who hold power and wealth, thereby putting pressure on them to influence policy changes. For import restrictions, the E.U. and U.S. have more disparate measures despite some similarities. For instance, the U.S. has used tariffs extensively to target Russian exports, while the E.U. rarely used these tools. They did coordinate on import bans on goods like gold, and implemented price caps for oil products against Russia. We detail the export and import restrictions by the E.U. and U.S. respectively in Section 2.3 and 2.4.

In terms of financial sanctions, the most important forms are a removal of several Russian banks from the financial messaging network (SWIFT) in two different rounds. Additionally, many major Western banks operating in Russia announced their plan to exit from Russian market even though

they have not been required by their governments to do so. Foreign banks are important in Russian trade, especially on the Russian import side.

2.1 The SWIFT Sanctions against Russian Banks

The Society for Worldwide Interbank Financial Telecommunication (SWIFT) is a cooperative founded on 3 May 1973 in Belgium and under Belgian law. SWIFT is owned by its 2,400 shareholders (financial institutions) around the world. It provides the main messaging network through which cross-border payments are initiated and is overseen by the G-10 central banks.[1]

SWIFT assigns Business Identifier Codes (BICs) to financial institutions, popularly known as "SWIFT codes". It then allows financial institutions to connect with each other and exchange financial information in a secure and reliable manner. SWIFT's messaging services are currently used by more than 11000 financial institutions in more than 200 countries and territories around the world.[2]

The rising geopolitical tensions have spread over to the global financial infrastructure. Western countries use SWIFT sanctions as a tool to punish adversary countries.[3] The first round of SWIFT sanction against Russian banks was stated in article 5h of COUNCIL REGULATION (EU) 2022/345 published on 1 March 2022, "It shall be prohibited as of 12 March 2022 to provide specialised financial messaging services" to 7 Russian banks: Bank Otkritie, Novikombank, Promsvyazbank, Bank Rossiya, Sovcombank, Vnesheconombank (VEB) and VTB BANK. Note that not all Russian banks were sanctioned at this point such as Gazprombank and Sberbank. However, in the second round, another 3 Russian banks, Sberbank, Credit Bank of Moscow, and Rosselkhozbank were added to the list on 3 June 2022 in COUNCIL REGULATION (EU) 2022/879. The application date would be 14 June 2022. After the two rounds, there were no further SWIFT sanctions against Russian banks. Based on our calculation, SWIFT sanctioned banks as transaction banks account for %34.42 (%32.83) of Russian export transactions (value) and %18.15 (%23.76) of Russian import transactions (value) in 2016.

[1] The Group of Ten or G10 is a group of 11 industrialized nations, including member countries Belgium, Canada, France, Germany, Italy, Japan, the Netherlands, Sweden, Switzerland, the United Kingdom, and the United States. The details of the oversight is available at https://www.swift.com/about-us/organisation-governance/swift-oversight.

[2] The number of financial institutions that use SWIFT services is reported on the SWIFT official website accessed in July 2024.

[3] Before Russian banks, all Iranian banks were disconnected from SWIFT on 17 March 2012, following ruling of the Council of the European Union.

Table 1: SWIFT Sanctioned Russian Banks

Panel A: First-round Bank List, published on 1 March 2022
Bank Otkritie
Novikombank
Promsvyazbank
Bank Rossiya
Sovcombank
Vnesheconombank (VEB)
VTB Bank

Panel B: Second-round Bank List, published on 3 June 2022
Sberbank
Credit Bank of Moscow
Joint Stock Company Russian Agricultural Bank, JSC Rosselkhozbank

Notes: This table reports the SWIFT sanctioned Russian banks. The document publication dates of the two rounds' sanction lists are 1 March 2022 and 3 June 2022. The application dates are 12 March 2022 and 14 June 2022.

2.2 Western Banks' Winding Down from Russia

Many Western banks were under public pressure and shunned Russia as a result of the invasion. On March 10, 2022, Goldman Sachs became the first major Western investment bank to announce a plan to exit from Russia, followed within the same day by JPMorgan Chase, the biggest bank in the United States. On March 15, 2022, Citi, which had the largest presence in Russia among U.S. banks, decided to wind down its Commercial Banking business in Russia.

Several EU-headquartered banks also announced plans to exit Russia. On March 11, 2022, "Deutsche Bank, which faced stinging criticism from some investors and politicians for its ongoing ties to Russia, said on Friday in a surprise move that it would wind down its business in the country".[4]

When these banks exit Russia, they may sell its assets to local Russian banks. For instance, on October 28, 2022, Citi announced on their website that "AO Citibank, Citi's Russian subsidiary, has agreed to sell a portfolio of ruble-denominated personal installment loans to Uralsib, a Russian commercial bank. Citi has also agreed to transfer to Uralsib a portfolio of ruble-denominated credit card balances, subject to customer consents."[5]

Based on our calculation, Western banks as Russian firms' transaction banks account for more

[4]See https://www.reuters.com/business/deutsche-bank-ceo-gets-20-pay-rise-2021-2022-03-11/.

[5]See https://www.citigroup.com/global/news/press-release/2022/citi-announces-agreement-to-sell-portfolio-of-russian-consumer-personal-installment-loans-to-uralsib.

than 26.5% (19.4%) of Russian exports and 46.8% (38.7%) of Russian import in terms of transaction count (value) in 2016. The significant reliance of Russian trade firms' reliance on Western banks as transaction banks motivate us to examine the impacts of Russian Western banks' winding down on Russian trade.

2.3 E.U. and U.S. Restrictions on Exports to Russia

The European Union export control measures were recorded in the COUNCIL REGULATION (EU) No 833/2014, initially published on 31 July 2014, updated to 21 pages in Regulation 2019/43) on July 09, 2019. The restrictions were substantially expanded since February 2022 and became 298 pages by 2023 in Regulation 2023/1214.

Table A.20 summarizes the new export controls imposed by the E.U. against Russia in 2022 and 2023. These sanctions target a range of products, with key categories including dual-use goods and technology, goods and technology for oil refining, the aviation or space industry, and luxury goods. The table details several regulatory updates, beginning with Regulation 2022/328 in February 2022, which imposed sanctions on dual-use goods and technology, oil refining equipment, and aviation-related goods. Subsequent updates revised these restrictions, adding new product categories and refining earlier measures, such as goods that could enhance Russian industrial capacities (Article 3k). Major regulatory updates occurred throughout 2022 and 2023, including revisions in March, April, July, October, December of 2022, and February of 2023, with additional updates in June 2023 targeting firearms and related components. Each regulatory update either introduced new restrictions or revised existing articles to enhance the effectiveness of the sanctions. Various revisions in general added more products. We will take the HS codes published at various time to conduct empirical analysis.[6]

In 2014, the United States listed a Supplement No. 2 to Part 746 of U.S. Export Administration Regulations (EAR) with Harmonized Tariff Schedule (HTS) codes, also known as Harmonized System (HS) codes, and items specified in ECCNs 0A998, 1C992, 3A229, 3A231, 3A232, 6A991, 8A992, and 8D999, where ECCN stands for "Export Control Classification Number", to regulate U.S. exports to Russia. A key in determining whether an export license is needed from the Department of Commerce is knowing whether the item a firm intends to export has a specific Export Control Classification Number (ECCN). The ECCN is an alpha-numeric code, e.g., 3A001, that describes the item and indicates licensing requirements. All ECCNs are listed in the Commerce Control List (CCL) (Supplement No. 1 to Part 774 of the EAR) which is available on the Govern-

[6]The European Union uses CN codes (Combined Nomenclature codes), which are an 8-digit coding system used by the European Union to classify goods for customs and statistical purposes. The first 6-digit of the CN codes coincide with that of the HS codes.

ment Printing Office website. The CCL is divided into ten broad categories, and each category is further subdivided into five product groups.[7]

The U.S. new export controls against Russia implemented in 2022 and 2023 are summarized in Table A.21, focusing on various industry sectors and luxury goods, as well as items related to chemical and biological weapons. The publication dates and associated product categories are specified, along with updates to different sections of the U.S. Export Administration Regulations (EAR). Key events include the introduction of new restrictions, such as the addition of a new section 746.8 in March 2022 covering Commerce Control List (CCL) Categories 3 to 9, and the imposition of industry sector sanctions (Supplement No. 4) and luxury goods restrictions (Supplement No. 5) throughout the year. These restrictions were updated multiple times, particularly in April and September 2022, with further revisions extending into 2023. Notably, in September 2022, controls on chemical and biological weapons-related products were introduced through Supplement No. 6. The table emphasizes the dynamic nature of U.S. export controls, revising earlier measures to address emerging concerns over Russia's access to sensitive goods and technologies. The revisions in general added more products. We will take the HS codes published at various time to conduct empirical analysis.

2.4 E.U. and U.S. Restrictions on Imports from Russia

The European Union announced a revocation of Russia's Most-Favored-Nation (MFN) status on March 15, 2022. The removal of MFN treatment allowed the E.U. to apply higher tariffs on Russian goods and impose more trade restrictions. However, tariff instruments were rarely used despite various other restrictions such as import bans were implemented subsequently. There measures were also recorded in the updates of the COUNCIL REGULATION (EU) No 833/2014 first published 31 July 2014.

Table A.22 summarizes the European Union's restrictions on Russian exports from 2022 to 2023, detailing the products affected, sanction measures, and corresponding Council Regulations. Starting in March 2022, the EU imposed an import ban on iron and steel products under Regulation 2022/428. Further bans were placed in April 2022 on certain products and coal (Regulation 2022/576). In June 2022, bans extended to crude oil, petroleum products, and additional items (Regulation 2022/879). July 2022 saw a ban on gold imports (Regulation 2022/1269), while a price cap on crude oil was implemented in December 2022 (Regulation 2022/2368). Petroleum products became subject to a price cap in February 2023 (Regulation 2023/251). Over this period, multiple revisions were made to import bans on iron and steel, as well as specific product categories,

[7] Tables A.29 and A.30 in the Appendix provide detailed categories and groups.

with updates in October and December 2022, and June 2023 (Regulations 2022/1904, 2022/2474, 2023/1214). The sanctions aim to limit Russia's revenue from key exports.

The United States new import restrictions against Russia were implemented through various legal tools, including the Executive Order (E.O.) and Proclamation by the President, congress legislation, and Determination released by the Office of Foreign Assets Control (OFAC) of the U.S. Department of the Treasury.

Table A.23 outlines new U.S. restrictions on Russian exports implemented in 2022 and 2023, detailing the products affected, sanction measures, and related legal authorities. Beginning on March 11, 2022, an import ban was placed on Russian fish, seafood, alcoholic beverages, and non-industrial diamonds under Executive Order 14068. On April 9, 2022, normal trade relations with Russia were suspended (H.R. 7108), and an import ban on oil, gas, and coal was introduced (H.R. 6968, E.O. 14066). The removal of the normal trade relations implied a switch of import tariff from the MFN status to "column 2" tariffs. Column 2 tariffs refer to a set of higher, punitive tariffs applied by the U.S. on imports from countries that do not have normal trade relations (NTR) or most-favored-nation (MFN) status. Further tariff increases on certain products followed in June 2022, along with an import ban on Russian gold (E.O. 14068). Price caps on crude oil and petroleum products were enforced in December 2022 and February 2023 (E.O. 14071). Additional tariff increases on aluminum and other products were implemented in March and February 2023 (Proclamations 10522 and 10523). In December 2023, the import ban on Russian fish and seafood was further strengthened under E.O. 14068.

3 Data

Our primary dataset is the Russian customs' transaction-level database covering the period from 2016 to 2023. This database is sourced from Yixun, a vendor based in China that collects official transaction-level customs data from various countries, similar to S&P Global's Panjiva Supply Chain Intelligence. We also observe that the dataset provides limited coverage of Russia's trade with other Eurasian Economic Union (EEU) members (Armenia, Belarus, Kazakhstan, Kyrgyzstan), likely due to differences in their recording systems as part of a Customs Union. Additionally, we supplement this data with UN Comtrade data reported by different countries. Note that Russia stopped reporting their product-level trade information to the UN Comtrade since the war broke out in February 2022.

To assess our primary dataset's quality, we compare it with Russia's official data as reported to UN Comtrade. Figure A.1 in the Appendix compares our export/import value data with Russian-reported UN Comtrade data at the HS-4 digit level for each year, demonstrating a strong

correlation. Figure A.2 in the Appendix compares the time series of export/import values on a monthly basis between our customs data and Russian-reported UN Comtrade data, showing that the two series align closely over time.

3.1 Transaction Banks in Russian Imports and Exports

A unique feature of our Russian customs data is that it includes information on banks with a bank code that are associated with Russian trade transactions, though this information is only available 2016-2017. In Table 2 and 3, we list the top 10 banks in 2016 for Russian imports and exports, respectively.[8] Note that 82.76% export transactions report a transaction bank in 2016, while 94.00% import transactions report a transaction bank.

For Russian imports in 2016, the top 10 banks account for 64.23% of the volume. Foreign banks play an important role with 7 of the top ten banks being foreign owned. The most active bank for Russian imports is Citibank (US), accounting for 14.63% of the total import transactions.

For Russian exports transactions, top 10 banks account for 64.22% of the volume. Foreign banks are less prominent for Russian exports than for imports. Sberbank (a Russian bank) is the most important bank, accounting for 22.88% of the total Russian exports, followed by Raiffeisenbank (an Austrian owned bank).

We note that Chinese banks did not play an important role as transaction banks back to 2016. The biggest four Chinese banks, Bank of China, Industrial and Commercial Bank of China, China Construction Bank and Agricultural Bank of China, only accounted for 0.47% of Russian export transactions and 0.27% of import transactions in 2016.

We then show the distribution of number of transaction banks used by trade firms. We focus on the distribution at the firm-country level. Figures A.3 and A.4 in the Appendix plot the histograms. We find that for either imports or exports, nearly 90% of the firm-country pairs only use one transaction bank. 8% pairs are with two transaction banks. As a result, it is very rare to see a pair with more than three or more transaction banks. This suggests that the firm-bank relationship tends to highly specialized.

We also check the persistence of transaction banks at the firm-country level within our dataset. Suppose we define a main bank as the bank that accounts for the largest share (by value) of its export/import transactions. We find that 93.8% maintained the same main bank from 2016h1 (first half of 2016) to 2016h2, and 91.2% maintained the same main bank from 2016h1 to 2017h1.

[8] 2017 data shows a similar pattern.

Table 2: Top 10 Transaction Banks in Russian Import

Bank name	Transaction count	Count share	Foreign bank?	SWIFT Ban?
Citibank	2109687	14.63%	Yes	
Sberbank	1316413	9.13%		Yes
Raiffeisenbank	995042	6.90%	Yes	
Deutsche Bank	933500	6.47%	Yes	
UniCredit Bank	925214	6.41%	Yes	
HSBC	678226	4.70%	Yes	
VTB Bank	524791	3.64%		Yes
Royal Bank of Scotland	450206	3.12%	Yes	
Alfa-Bank	410943	2.85%		
Credit Agricole CIB	330889	2.29%	Yes	

Notes: This table reports the top 10 transaction banks in Russian import in 2016. The Royal Bank of Scotland in Russia was liquidated in 2016.

Table 3: Top 10 Transaction Banks in Russian Export

Bank name	Transaction count	Count share	Foreign bank?	SWIFT ban?
Sberbank	528461	22.88%		Yes
Raiffeisenbank	251528	10.89%	Yes	
CMRbank	144109	6.24%		
VTB Bank	134012	5.80%		Yes
Citibank	132096	5.72%	Yes	
Gazprombank	81853	3.54%		
UniCredit Bank	80243	3.47%	Yes	
PJSC Promsvyazbank	55110	2.38%		Yes
Otkritie Bank	40765	1.76%		Yes
Alfa-Bank	35532	1.54%		

Notes: This table reports the top 10 transaction banks in Russian export in 2016.

3.2 An Overview of Russian Trade

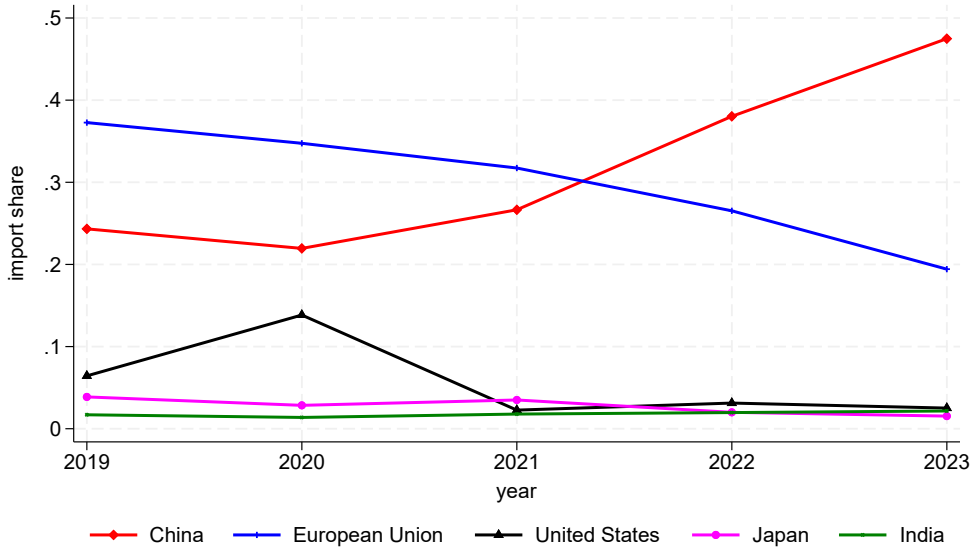
We first present the aggregate patterns of Russian trade using the Russian customs data, including top trading partners and industries of its import and export.

Figure 1 shows the import value shares of Russian top partners. In Panel (a), we directly show the shares of the world top 5 economies (U.S., China, E.U., Japan and India). In Panel (b), we plot the shares of other individual countries that are among the top 10 import source countries in either 2020 or 2023. China shows a significant increase in its share of Russian imports, rising steadily from around 20% in 2019 to approximately 50% by 2023. The European Union experienced a notable decline, dropping from over 35% in 2019 to under 20% by 2023. The No.1 partner of Russian import thus changed from the European Union to China. United States, Japan, and India have minimal import shares across the period, with the U.S. showing a sharp decline to near zero by 2023, and India maintaining a small, relatively stable share. Germany starts with the highest share among these partners, around 10% in 2019, but sees a decline over the years. Turkey shows a steady increase, surpassing other partners by 2023. Italy, France, South Korea, Poland, and Vietnam all have relatively small and stable shares, with slight fluctuations during the period. Overall, the data highlights a significant shift in Russia's import patterns, with China emerging as the dominant trade partner by 2023, while the European Union and other Western countries see a sharp decline in their shares. Turkey also grows as an important partner, while other major partners remain stable but with lower shares.

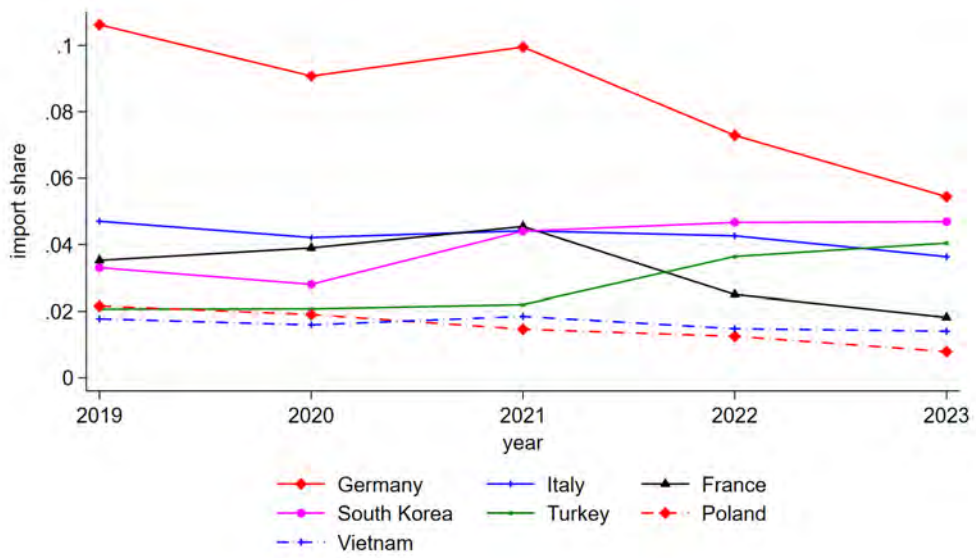
Figure 2 shows the value share of top export destinations of Russia. In Panel (a), we directly show the shares of the world's top 5 economies (U.S., China, E.U., Japan and India). In Panel (b), we plot the shares of other individual countries that are among the top 10 export destination countries in either 2020 or 2023. China steadily increases its share of Russian exports, particularly after 2022, overtaking the European Union (blue line) by 2023. China's share rises to around 30%. The European Union experiences a decline from around 40% in 2019 to under 20% by 2023. India shows notable growth in its export share starting in 2022, rising significantly by 2023. The shares of United States and Japan remain relatively low throughout the period, with both declining sharply after 2022. For other major partners, Netherlands holds the largest share among these partners but sees a marked decline after 2022. Turkey shows an increase, particularly in 2023, positioning it as a significant export partner. Poland , Germany, Italy , and other countries have small and stable shares, though several decline after 2022. Uzbekistan, Egypt, and Brazil exhibit minimal shares throughout the period, with minor fluctuations. Overall, the figure highlights a significant shift in Russia's export patterns, with China becoming a dominant export partner by 2023, while the European Union and several Western countries experience declines. India and Turkey emerging as

important partners, whereas other major partners see relatively stable but smaller shares.

Figure 1: Russian Import: Top Partners' Share



(a) World Top 5 Economies

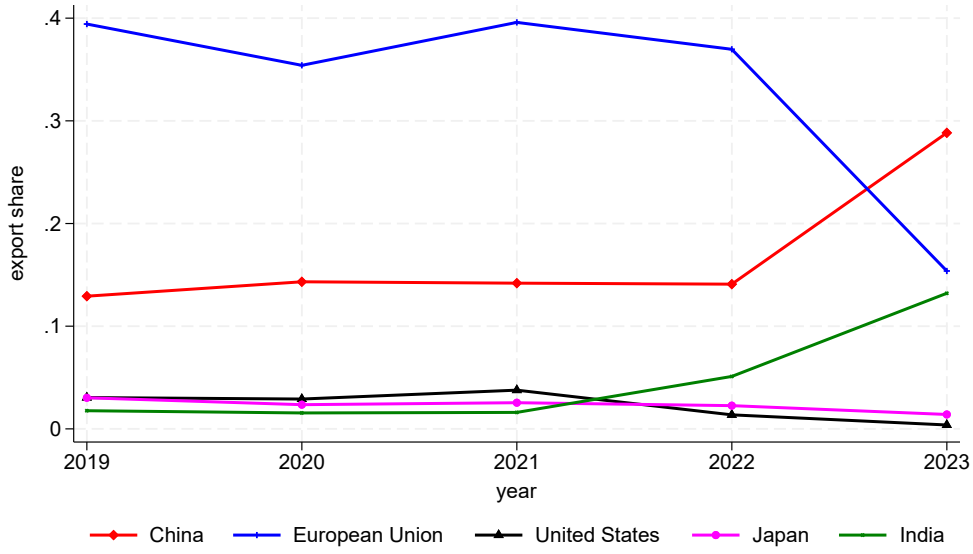


(b) Other Major Partners

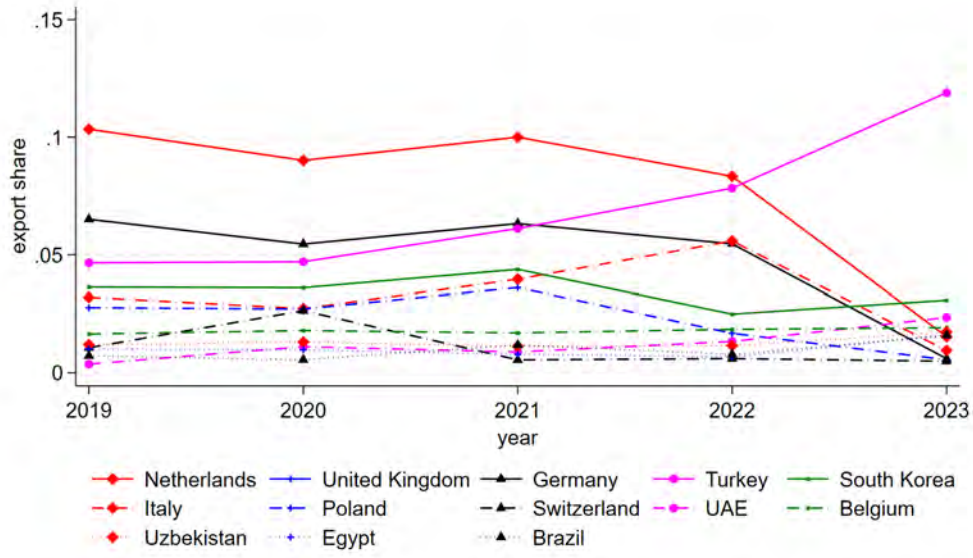
Notes: This graph shows Russian import's top trading partners' shares.

Table 4 provides an overview of Russia's top import and export sections in 2020, highlighting the country's key trading sectors. Sections are a group of chapters (2-digit HS codes) in the HS classification system. On the import side, Machinery, Appliances, and Electrical Equipment dom-

Figure 2: Russian Export: Top Partners' Share



(a) World Top 5 Economies



(b) Other Major Partners

Notes: This graph shows Russian export's top trading partners' shares.

inate with 30.41%, followed by Vehicles, Aircraft, and Vessels at 13.16%, and Chemical Products making up 11.89%. In contrast, Russia's exports are heavily weighted towards Mineral Products, which also account for 30.41%, underscoring the country's dependence on raw materials for its exports. Base Metals and Precious Stones are other significant export categories. The export data reflects Russia's reliance on natural resources, while the import data shows a dependency on high-value manufactured goods, such as machinery and vehicles. This trade structure points to a clear distinction between Russia's role as a major exporter of raw materials and an importer of advanced industrial products.

We then examine the level dynamics of trade values by industries and different trading partners. We group Russian trading partners into five categories: Western countries (E.U. 27 member countries, U.S., U.K. Canada, Australia, New Zealand, Japan, Korea, Norway, and Switzerland), China, India, Commonwealth of Independent States (CIS, Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan and Moldova) and other countries.

Figure A.5 in the Appendix provides an analysis of Russian monthly import value dynamics from different partners, segmented by various industries. It includes six subfigures. Panel (a) shows the total monthly import values across all sectors. The data reveals fluctuating import levels with significant contributions from Western countries and "Other", while imports from China (red) steadily increase over time, substituting Western countries. Imports from India and CIS countries remain relatively small throughout. The substitution effects of China for Western countries are found in panel (b) (Machinery, Appliances, Electrical Equipment), (c) (Vehicles, Aircraft, Vessels), (e) (Pulp of Wood, Paper) and (f) (Base Metals and Articles of Base Metals). While in Panel (d) (Products of the Chemical or Allied Industries), the decline in import values from Western countries is milder.

Figure A.6 in the Appendix illustrates the monthly dynamics of Russian export values across various sectors, segmented by trading partners. In the overall export dynamics (panel a), Western countries initially dominate, but over time, China's and India's shares grow, particularly from mid-2022 onward. This shift is most evident in Mineral Products (panel b), where China gradually takes over a significant portion of exports previously dominated by the West, and India's presence also becomes more noticeable, especially after 2022. In the Base Metals and Articles of Base Metals sector (panel c), China consistently increases its share, slowly replacing Western countries, while India has a smaller but growing contribution. Similarly, in Products of the Chemical or Allied Industries (panel e), China's share rises steadily, and India begins to emerge as a notable partner, while Western countries' dominance declines. In Vehicles, Aircraft, and Vessels (panel f), although the Western share remains significant, there is a gradual increase in exports to China and India,

indicating a shift in trade partnerships. However, CIS countries and other countries do not see significant overall changes in their import values from Russia.

Table 4: Top 5 Russian Export and Import Sections in 2020

Panel A: Import		
Section Name	Section Code	Share
Machinery, Appliances, Electrical Equipment	16	30.41%
Vehicles, Aircraft, Vessels	17	13.16%
Products of the Chemical or Allied Industries	6	11.89%
Pulp of Wood, Paper	10	10.52%
Base Metals and Articles of Base Metals	15	5.59 %
Panel B: Export		
Section Name	Section Code	Share
Mineral Products	5	30.41%
Base Metals and Articles of Base Metals	15	13.16%
Pearls, precious stones, precious metals	14	11.89%
Products of the chemical or allied industries	6	10.52%
Vehicles, Aircrafts, Vessels	17	5.59 %

Notes: This table reports Russian import and export composition based on the shares of sections of its import and export in 2020.

4 The Effects of Financial Sanctions on Russian Trade

4.1 Baseline Estimates

We start with financial sanctions and our baseline regression is conducted at the bank-product-country-month level. Here, "bank" refers to the aggregation of all firms that use that particular bank as their main transaction bank. For each firm-country pair, we use the main transaction bank data from 2017 and aggregate import and export values at the bank-product-country-month level for the period from January 2020 to December 2023.[9]

Our baseline regression setting is

$$\ln y_{bckt} = \alpha_{bckm} + \delta_{ckt} + \beta_1 * SWIFT_{1bt} + \beta_2 * SWIFT_{2bt} + \beta_3 * West\_bank_b * Post\_war_t + \epsilon_{bckt}, \quad (1)$$

[9]We do not use regressions at the firm-product-country-month level as the baseline setting. As we will demonstrate shortly, many Russian firms cease trading with some countries due to financial sanctions, which would require imputing zero trade observations at this level in order to capture this important margin of response to financial sanctions. This would greatly increase the number of observations, making the regression computationally infeasible. However, in the intensive margin analysis, we conduct firm-product-country-month level regressions without considering zero trade observations.

where y_{bckt} is the bank b-product k-country c-month t import or export value. $SWIFT_{jbt}$, $j = 1, 2$ is a dummy variable that corresponds to those Russian banks that were subject to SWIFT sanction in round j after time t. $West\_bank_b$ is a dummy variable that equals 1 if bank b is a major bank that operated in Russia with the ownership by Western countries. $Post\_war_t$ is a time dummy denoting whether time t is post the Russo-Ukrainian War (i.e., $t \geq March$ 2022). We control for individual fixed effects α_{bckm} with additional seasonality subscript m and product-country-time fixed effects δ_{ckt}, where the latter essentially controls demand and supply factors at the product-country-time level including Western trade sanctions against Russia implemented at the product level.

Table 5 presents the effects of two rounds of SWIFT sanctions and the withdrawal of Western banks on Russian trade values, using data on Russian imports and exports. The regression is conducted at the bank-product-country-month level, with observations from January 2020 to December 2023. The table is divided into two main parts: the first four columns capture the effects on Russian imports, while the last four columns focus on Russian exports.

In Column (1), we examine the impact of SWIFT sanction 1, SWIFT sanction 2, and the withdrawal of major Western banks on total Russian imports. The coefficient for SWIFT sanction 1 is -0.175, implying a 16.1% (=1-exp(-0.175)) reduction in total imports following the first round of SWIFT sanctions, which is statistically significant at the 1% level. This indicates a meaningful negative effect on Russian imports as a result of the sanctions. Similarly, SWIFT sanction 2 has a slightly larger effect, with a coefficient of -0.190, representing a 17.3% (=1-exp(-0.190)) reduction in total imports. This result is also statistically significant at the 1% level, suggesting that the second round of sanctions had an even more pronounced impact on Russian imports. Finally, the withdrawal of Western banks (West bank post war) leads to a dramatic 40.8% (=1-exp(-0.524)) reduction in imports, which is statistically significant at the 1% level. This suggests that the exit of Western financial institutions severely disrupted Russia's ability to engage in imports. Column (2) highlights the particular impact on trade with the West. In Column (2), we interact financial sanctions with non-West country dummies. It shows that for Western countries, the coefficient for SWIFT sanction 1 is -0.277, implying a 24.2%(=1-exp(-0.277)) reduction in imports from Western countries, statistically significant at the 1% level. This indicates that the first round of SWIFT sanctions had a substantial negative effect on Russia's trade with the West. The second round of SWIFT sanctions (SWIFT sanction 2) has an even larger impact, with a coefficient of -0.457, reflecting a 36.7%(=1-exp(-0.457)) reduction in imports from the West, also statistically significant at the 1% level. This suggests that the second round of sanctions had a particularly severe effect on Russia's import trade with Western countries. The Western banks' withdrawal (West bank

post war) has an even more pronounced effect, with a coefficient of -0.670, leading to a 48.8%(=1-exp(-0.670)) reduction in imports from Western countries. This result is also highly significant (at the 1% level), underscoring the severe disruption to trade with the West caused by the exit of Western banks. The interaction terms in column (2) are all positive and statistically significant, suggesting that Russian imports from non-Western countries are less impacted by the sanctions. Columns (3) and (4) present results for Western and non-Western countries separately, allowing for a clearer comparison of the effects across these two groups.

Column (5) focuses on total Russian exports, revealing the effects of the same sanctions and the bank withdrawal on Russian export activity. The coefficient for SWIFT sanction 1 is -0.056, indicating a 5.45%(=1-exp(-0.056)) reduction in total exports following the first round of SWIFT sanctions, which is statistically significant at the 10% level. This suggests that while the first round of sanctions reduced Russian exports, the effect was more modest compared to imports. The second round of SWIFT sanctions (SWIFT sanction 2) has a larger coefficient of -0.096, reflecting a 9.15%(=1-exp(-0.096)) reduction in total exports, statistically significant at the 1% level. This suggests that the second round of sanctions had a stronger negative effect on Russian exports than the first. The Western banks' withdrawal (West bank post war) leads to a 15.4%(=1-exp(-0.167)) reduction in exports, with a coefficient of -0.167, which is statistically significant at the 1% level. This finding indicates that the withdrawal of Western banks also significantly impacted Russian export activity, though the effect was smaller than on imports. Column (6) reveals that the sanctions and bank withdrawals had a much stronger impact on exports to the West than on total exports, where we have interacted the financial sanctions with non-West countries dummy. The coefficient for SWIFT sanction 1 is -0.209, indicating a 18.9%(=1-exp(-0.209)) reduction in exports to Western countries following the first round of SWIFT sanctions, statistically significant at the 1% level. The second round of SWIFT sanctions (SWIFT sanction 2) has a similar effect, with a coefficient of -0.190, leading to a 17.3%(=1-exp(-0.190)) reduction in exports to the West, statistically significant at the 1% level. This suggests that the second round of sanctions continued to strongly affect Russia's export trade with Western countries. The Western banks' withdrawal (West bank post war) has a coefficient of -0.255, indicating a 22.5%(=1-exp(-0.255)) reduction in exports to Western countries, statistically significant at the 1% level. This highlights the significant negative impact of the withdrawal of Western banks on Russia's ability to export to the West. The 3 point estimates for the interaction terms with non-West dummies are all positive with the first statistically significant at the 1% level and the second statistically significant at the 10% level. This suggests SWIFT sanctions and Western banks' withdrawals had a smaller impacts on Russian exports to non-West countries than West countries. Columns (7) and (8) report results for Western

and non-Western countries separately, directly comparing the effects on the two groups' countries.

Table 5: Effects of SWIFT Sanction and Western Banks' Withdrawal on Russian Trade Value

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import				Russian Export			
	all sample		West	non-West	all sample		West	non-West
swift sanction 1	-0.175***	-0.277***	-0.277***	-0.079***	-0.056*	-0.209***	-0.209***	0.001
	(0.018)	(0.032)	(0.032)	(0.019)	(0.031)	(0.062)	(0.062)	(0.034)
swift sanction 2	-0.190***	-0.457***	-0.457***	0.062***	-0.096***	-0.190***	-0.190***	-0.069**
	(0.015)	(0.024)	(0.024)	(0.017)	(0.031)	(0.068)	(0.068)	(0.033)
West bank post war	-0.524***	-0.670***	-0.670***	-0.316***	-0.167***	-0.255***	-0.255***	-0.141***
	(0.021)	(0.028)	(0.028)	(0.028)	(0.042)	(0.096)	(0.096)	(0.046)
swift sanction 1* non-West		0.198***				0.210***		
		(0.037)				(0.069)		
swift sanction 2* non-West		0.519***				0.121*		
		(0.029)				(0.072)		
West bank post war *non-West		0.353***				0.114		
		(0.041)				(0.105)		
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	3059388	3059388	1966693	1092695	370952	370952	104801	266151
R^2	0.853	0.854	0.862	0.828	0.951	0.951	0.959	0.945

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table reports Russian import and export responses to two rounds' SWIFT sanctions and the withdrawal of Western major banks from Russia at the bank-product-country level.

4.2 Western Banks by the Extent of Withdrawal from Russia

We explore the heterogeneity in Western banks' withdrawal from Russia. Despite almost all major Western banks claimed that they had a plan to exit from Russia, we find that their asset position in Russia displayed large heterogeneity. We report major foreign banks' asset growth rates between 2021 and 2023 in Russia in Appendix Table A.28. It shows that while banks such as HSBC (-62.25% asset growth in local currency) and Credit Agricole CIB (-59.20% asset growth), significantly reduced their operation in Russia, other banks such as J.P. Morgan (371.86% asset growth), OTB Banks (140.76% asset growth) and Chinese banks have significantly expanded their business. We classify Western banks by their relative asset growth to the aggregate banking sector in Russia and denote a Western bank as an expanding bank if its asset growth is higher than Russian nationwide banking sector asset growth. Otherwise, we label a Western bank as a contracting bank.

In Table 6, we split the Western bank post war dummy by expanding and contracting Western banks separately. Interestingly, we find that indeed that Russian trade tended to decline more for the contracting Western banks after the war.

Table 6: Effects of SWIFT Sanction and Western Banks on Russian Trade Value by Western Banks' Extent of Exiting

	(1)	(2)	(3)	(4)	(5)	(6)
	Russian Import			Russian Export		
	all sample	West	non-West	all sample	West	non-West
swift sanction 1	-0.175***	-0.276***	-0.079***	-0.056*	-0.209***	0.001
	(0.018)	(0.032)	(0.019)	(0.031)	(0.062)	(0.034)
swift sanction 2	-0.191***	-0.457***	0.061***	-0.096***	-0.190***	-0.069**
	(0.015)	(0.024)	(0.017)	(0.031)	(0.068)	(0.033)
Contracting West bank post war	-0.551***	-0.699***	-0.336***	-0.170***	-0.252***	-0.144***
	(0.022)	(0.029)	(0.029)	(0.043)	(0.098)	(0.046)
Expanding West bank post war	-0.113***	-0.219***	-0.016	0.020	-0.368	0.113
	(0.040)	(0.050)	(0.087)	(0.125)	(0.310)	(0.150)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y
Observations	3059388	1966693	1092695	370952	104801	266151
R^2	0.853	0.862	0.828	0.951	0.959	0.945

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.3 Trade with Different (Groups of) Partners

Table 7 presents the effects of SWIFT sanctions 1 and 2 and the Western bank withdrawal on Russian imports from various partner countries, disaggregated by region. The table includes eight columns, each reporting the regression results for a different group of trade partners: the European Union (EU), United States (U.S.), Other Western countries, China, India, Turkey, CIS (Commonwealth of Independent States) countries, and Other non-Western countries.

In Column (1), which focuses on imports from the EU, the first round of SWIFT sanctions 1 is associated with a 24.0%(=1-exp(-0.274)) reduction in imports from the EU, statistically significant at the 1% level. The second round of SWIFT sanctions (SWIFT sanction 2) leads to an even larger decrease, with a 42.3%(=1-exp(-0.550)) reduction, also highly significant. The Western banks' withdrawal (West bank post war) causes a 46.2%(=1-exp(-0.619)) reduction in EU imports, underscoring the severe impact on trade with the EU following the exit of Western banks. These results indicate that the EU was notably affected by the sanctions and the banking exit. For imports from the U.S. (Column (2)), the impact of the sanctions is even more pronounced. SWIFT sanction 1 results in a 53.1%(=1-exp(-0.758)) reduction, while the estimate before SWIFT sanction 2 is -135.3%, both statistically significant at the 1% level. The estimate for Western banks' withdrawal is -1.811, again significant at the 1% level. This suggests that the U.S. had the most severe negative impact, i.e., a 83.7%(=1-exp(-1.811))) reduction in response to both rounds of sanctions and the banking exit, with U.S. imports experiencing the largest decreases. Column (3), which examines imports from Other Western countries, shows an overall similar pattern.

SWIFT sanction 1 leads to a 24.1%(=1-exp(-0.276)) reduction, and SWIFT sanction 2 leads to a 20.7%(=1-exp(-0.232)) increase in imports from other Western countries, statistically significant at the 1% level. Interestingly, the point estimate for Western banks' withdrawal is -116.1% in imports from these countries, further confirming that Western banking institutions' exit had a substantial negative impact on trade.

For imports from China (Column (4)), the effects of the sanctions are smaller. SWIFT sanction 1 results in a 4.59%(=1-exp(-0.047)) reduction in imports from China, while SWIFT sanction 2 leads to a modest 8.51%(=1-exp(-0.089)) increase, which is statistically significant. In contrast, the Western banks' withdrawal has a 34.6%(=1-exp(-0.424)) reduction in imports from China. These results suggest that while China was not as severely affected as Western partners by the sanctions, there was still a noticeable decline in imports following the Western banks' exit. Column (5), which focuses on imports from India, shows a 23.5%(=exp(0.211)-1) increase following SWIFT sanction 1, which is statistically significant at the 10% level. This suggests that imports from India were somewhat insulated or even benefited from the first round of sanctions. However, the second round of SWIFT sanctions has little effect, with a 0.02% reduction, and the Western bank withdrawal leads to a 12.2%(=1-exp(-0.13)) reduction. This suggests that while India may have gained in the short term from the first round of sanctions, it faced more limited negative effects from the later sanctions and the banking withdrawal. Column (6) analyzes imports from Turkey, showing that SWIFT sanction 1 and SWIFT sanction 2 have minimal effects, with -0.70%(=1-exp(-0.007)) and 5.02%(=exp(0.049)-1) changes respectively, both of which are not statistically significant. However, the Western banks' withdrawal leads to a significant 38.8%(=exp(0.328)-1) increase in imports from Turkey, suggesting that Turkey may have benefited from increased trade as a result of the withdrawal of Western financial institutions, possibly taking advantage of trade opportunities that opened up in the aftermath. Column (7) reports the impact on imports from the CIS countries. Here, the results are somewhat mixed. SWIFT sanction 1 leads to a 22.3%(=1-exp(-0.252)) reduction in imports, while SWIFT sanction 2 results in a 27.8%(=1-exp(-0.326)) reduction, both statistically significant. Interestingly, the Western banks' withdrawal is associated with a 34.9%(=exp(0.299)-1) increase in imports from the CIS, suggesting that trade with CIS countries may have been less affected or even benefited from the disruption in Western trade relationships. Finally, Column (8) examines imports from Other non-Western countries. SWIFT sanction 1 leads to a 34.7%(=1-exp(-0.426)) reduction in imports from these countries, and SWIFT sanction 2 results in a 14.6%(=1-exp(-0.158)) reduction, both statistically significant at the 1% level. The Western banks' withdrawal has a 41.0%(=1-exp(-0.528)) reduction in imports from these countries, indicating that the sanctions and the banking exit had a substantial negative

effect on trade with other non-Western nations as well.

In conclusion, the table reveals varying degrees of impact across different Russian import partners, with Western countries (particularly the EU and U.S.) experiencing the largest declines in trade due to both rounds of SWIFT sanctions and the withdrawal of Western banks. Conversely, some non-Western countries, such as China and India, were less affected or even benefited from certain sanctions, particularly in the case of India. The results highlight the diverse and region-specific effects of the sanctions and banking exit on Russia's imports.

Table 8 presents the effects of SWIFT sanctions 1 and 2 and the Western banks' withdrawal on Russian exports to different trading partners, categorized by region as well.

In Column (1), which reports results for exports to the E.U., SWIFT sanction 1 has a small and statistically insignificant effect on exports (-8.79%=1-exp(-0.0920)), while SWIFT sanction 2 causes a statistically significant reduction of 22.4%(=1-exp(-0.254)), suggesting a more pronounced impact in the second round of sanctions. The Western banks' withdrawal results in a 19.6%(=1-exp(-0.218)) reduction, statistically significant at the 5% level, indicating that the exit of Western banks also contributed to a decline in Russian exports to the E.U. For exports to the U.S. (Column (2)), the effects are more notable. SWIFT sanction 1 leads to a 34.1%(=1-exp(-0.417)) reduction, statistically significant at the 1% level, while SWIFT sanction 2 has no significant effect on exports. The Western bank withdrawal leads to a 44.6%(=1-exp(-0.591)) reduction in Russian exports to the U.S., also statistically significant at the 10% level, showing that both rounds of SWIFT sanctions and the banking exit had a substantial negative impact on trade with the U.S. In Column (3), focusing on other Western countries, SWIFT sanction 1 results in a 12.1%(=1-exp(-0.129)) reduction, though it is not statistically significant. SWIFT sanction 2 has a minimal effect on exports, with only a 1.69%(=1-exp(-0.017)) reduction, which is also not statistically significant. The Western bank withdrawal leads to a 19.3%(=1-exp(-0.215)) reduction, but this effect is not significant, suggesting that while the sanctions had some impact on exports to Other Western countries, the effect was less pronounced compared to the EU and the U.S.

For exports to China (Column (4)), SWIFT sanction 1 leads to a 14.4%(=exp(0.135)-1) increase, indicating that the first round of sanctions might have had a counterintuitive effect on trade with China. However, SWIFT sanction 2 results in a 6.94%(=1-exp(-0.072)) reduction, which is not statistically significant. The Western banks' withdrawal is associated with a 27.0%(=exp(0.239)-1) increase in exports, suggesting that trade with China may have benefited from the disruption in Western trade relationships. In Column (5), focusing on exports to India, SWIFT sanction 1 results in a 35.3%(=1-exp(-0.435)) reduction, significant at the 10% level. SWIFT sanction 2 has a 60.7%(=1-exp(-0.934)) reduction, which is highly significant, showing that the second round of

sanctions had a particularly large and negative effect on exports to India. The Western banks' withdrawal has no statistically significant effect on exports to India. Column (6) analyzes exports to Turkey, showing that SWIFT sanction 1 leads to a 17.6%(=1-exp(-0.193)) reduction, which is not statistically significant. SWIFT sanction 2 results in a 21.7%(=1-exp(-0.245)) reduction, significant at the 10% level. The Western banks' withdrawal has no significant effect on exports to Turkey, suggesting that while the sanctions reduced exports to Turkey, the withdrawal of Western banks did not have a major impact.

For exports to CIS countries (Column (7)), SWIFT sanction 1 has no significant effect, but SWIFT sanction 2 results in a 3.24%(=1-exp(-0.033)) reduction, statistically significant at the 5% level. The Western banks' withdrawal has a 12.2%(=1-exp(-0.130)) reduction , significant at the 5% level, highlighting the negative impact of both sanctions and the banking exit on Russian exports to the CIS region. Finally, Column (8) reports the results for exports to other non-Western countries. SWIFT sanction 1 has a 8.70%(=1-exp(-0.091)) reduction, significant at the 10% level. SWIFT sanction 2 leads to a 9.24%(=1-exp(-0.097)) reduction, significant at the 5% level. The Western banks' withdrawal results in a 19.9%(=1-exp(-0.222)) reduction, statistically significant at the 1% level, indicating that exports to other non-Western countries were also negatively affected by the sanctions and the exit of Western financial institutions.

In summary, the results indicate that SWIFT sanctions and Western bank withdrawal had a varying but generally negative impact on Russian exports across different partners. The sanctions and banking exit had the most significant effects on exports to the U.S., E.U. and India, while countries like China and Turkey showed more mixed or limited effects, suggesting that trade with these countries may have been more resilient to the sanctions.

Based on the estimates from the above two tables, we tabulate the trade value change (annualized) due to these financial sanctions by trading partners in Table 9 and 10.

Table 9 demonstrate that financial sanctions have generated heterogeneous trade effects across Russia's partner countries, with Western economies experiencing the most substantial import reductions. The European Union exhibits the largest absolute decline ($-34.86billion), primarily driven by Western banks winding down operations ($-22.62billion), while the United States shows a significant but comparatively smaller reduction ($-5.66billion). Non-Western partners present divergent responses: China manifests an overall decrease ($-6.06billion) despite a temporary positive fluctuation during the second SWIFT round ($+1.29billion), whereas India and Turkey record marginal net increases ($+0.60billion and $+1.30billion respectively), suggesting limited effects. The substantial contraction in other non-Western countries ($-20.36billion) reveals important secondary effects of financial sanctions beyond their immediate targets. This may be due to limited

Table 7: Effects of SWIFT Sanction and Western Banks' Withdrawal on Russian Import Value by Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian import							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.274***	-0.758***	-0.276***	-0.047**	0.211*	-0.007	-0.252**	-0.426***
	(0.033)	(0.160)	(0.060)	(0.020)	(0.127)	(0.075)	(0.117)	(0.072)
swift sanction 2	-0.550***	-1.353***	0.232***	0.089***	-0.019	0.049	-0.326**	-0.158***
	(0.028)	(0.145)	(0.053)	(0.019)	(0.111)	(0.073)	(0.140)	(0.059)
West bank post war	-0.619***	-1.811***	-1.161***	-0.424***	-0.130	0.328***	0.299*	-0.528***
	(0.028)	(0.146)	(0.069)	(0.030)	(0.120)	(0.072)	(0.156)	(0.082)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1684574	69535	212584	762313	21452	106327	12839	189764
R^2	0.861	0.851	0.868	0.799	0.885	0.858	0.835	0.900

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table reports Russian import responses to two rounds' SWIFT sanctions and the withdrawal of Western major banks from Russia by trading partners at the bank-product-country level.

Table 8: Effects of SWIFT Sanction and Western Banks' Withdrawal on Russian Export Value by Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Export							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.092	-0.417***	-0.129	0.135	-0.435*	-0.193	0.079	-0.091*
	(0.095)	(0.070)	(0.154)	(0.112)	(0.231)	(0.165)	(0.054)	(0.049)
swift sanction 2	-0.254***	-0.078	-0.017	-0.072	-0.934***	-0.245*	-0.019	-0.097**
	(0.089)	(0.114)	(0.158)	(0.096)	(0.321)	(0.146)	(0.048)	(0.043)
West bank post war	-0.218**	-0.591*	-0.215	0.239	0.201	-0.001	-0.130**	-0.222***
	(0.087)	(0.306)	(0.258)	(0.151)	(0.184)	(0.164)	(0.058)	(0.059)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	78020	17416	9365	16566	2904	6651	93817	146213
R^2	0.960	0.941	0.922	0.905	0.916	0.963	0.932	0.943

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table reports Russian export responses to two rounds' SWIFT sanctions and the withdrawal of Western major banks from Russia by trading partners at the bank-product-country level.

Table 9. Russian Import Value Change (annualized, billion USD) by Partners Due to Financial Sanctions

	(1) E.U.	(2) U.S.	(3) Other West	(4) China	(5) India	(6) Turkey	(7) CIS	(8) Other Non-West
First Round SWIFT	-3.38	-4.18	-0.96	-1.57	0.62	-0.01	-0.20	-5.20
Second Round SWIFT	-8.86	-0.79	0.42	1.29	-0.00	0.10	-0.25	-3.31
Western Banks Winding Down	-22.62	-0.69	-0.65	-5.78	-0.02	1.21	0.19	-11.85
Total	-34.86	-5.66	-1.18	-6.06	0.60	1.30	-0.26	-20.36
Total(% of 2021 Trade)	-18.5	-36.3	-3.1	-9.2	8.8	4.7	-1.2	-21.7

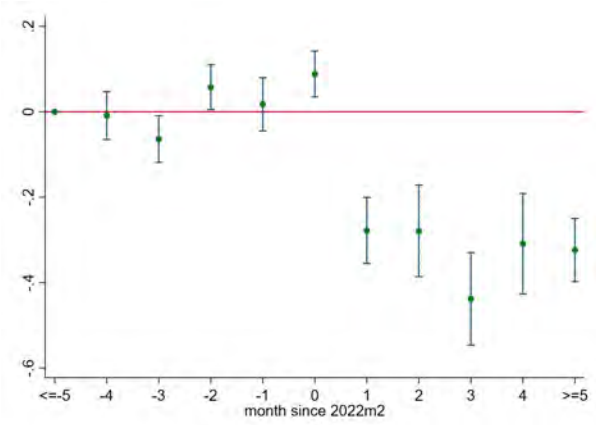
Table 10. Russian Export Value Change (annualized, billion USD) by Partners Due to Financial Sanctions

	(1) E.U.	(2) U.S.	(3) Other West	(4) China	(5) India	(6) Turkey	(7) CIS	(8) Other Non-West
First Round SWIFT	1.21	-0.96	-0.19	0.95	-0.13	-0.15	0.02	-0.43
Second Round SWIFT	-3.67	-0.02	-0.00	-0.91	-0.08	-0.11	-0.00	-0.89
Western Banks Winding Down	-15.14	-0.14	-0.42	6.72	0.11	-0.00	-0.00	-4.76
Total	-17.60	-1.12	-0.61	6.76	-0.10	-0.26	0.02	-6.08
Total(% of 2021 Trade)	-14.1	-20.8	-2.8	11.6	-2.8	-0.40	0.005	-16.0

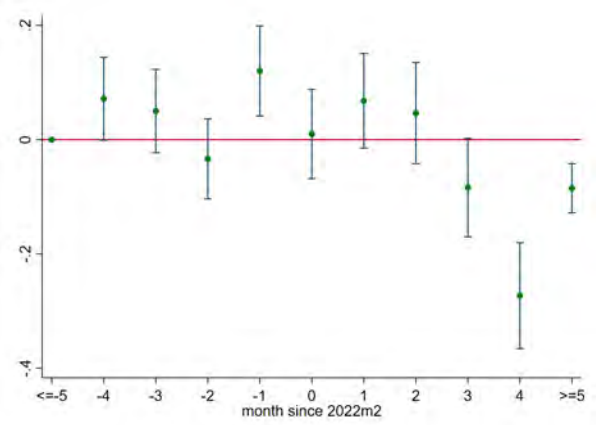
tools to mitigate the impacts of financial sanctions in other non-Western countries.

The export impact analysis in Table 10 reveals significant heterogeneity across Russia's trading partners following financial sanctions as well. Most strikingly, European Union nations experienced a $17.60 billion reduction, with Western banks winding down operations accounting for the majority of this decline ($-15.14 billion). Conversely, China emerged as the primary beneficiary, showing a net $6.76 billion increase in exports from Russia, predominantly during the Western banks' withdrawal phase ($+6.72 billion). The United States and other Western countries exhibited modest decreases ($-1.12 billion and $-0.61 billion respectively), while Commonwealth of Independent States (CIS) members remained largely unaffected ($+0.02 billion). Notably, India showed slightly negative trade flows ($-0.1 billion) with financial sanctions, whereas Turkey and other non-Western nations showed minor reductions ($-0.26 billion and $-6.08 billion respectively). These patterns suggest that financial sanctions have redistributed, rather than uniformly reduced, Russian exports, with trade flows partially reorienting toward strategically important partners like China while maintaining stability with traditional allies in the CIS region.

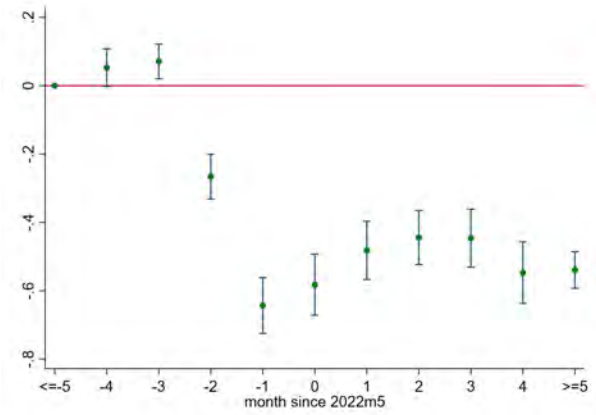
Figure 3: Russian Import Value Response to Financial Sanctions



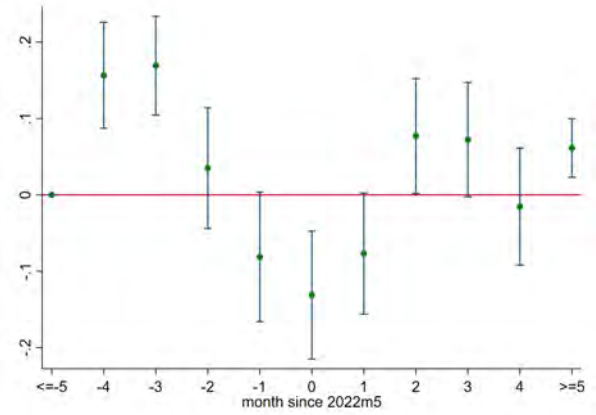
(a) SWIFT Sanction 1 on Russian Import from West



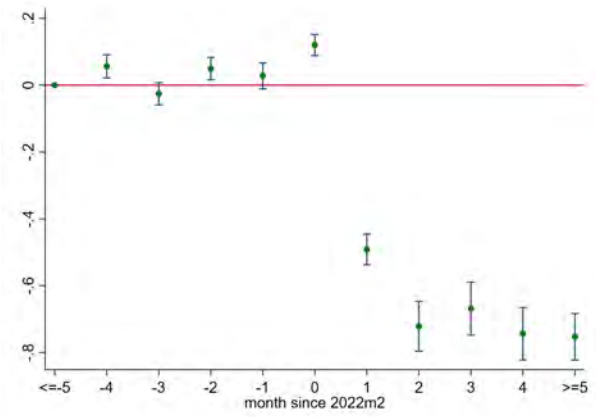
(b) SWIFT Sanction 1 on Russian Import from Non-West



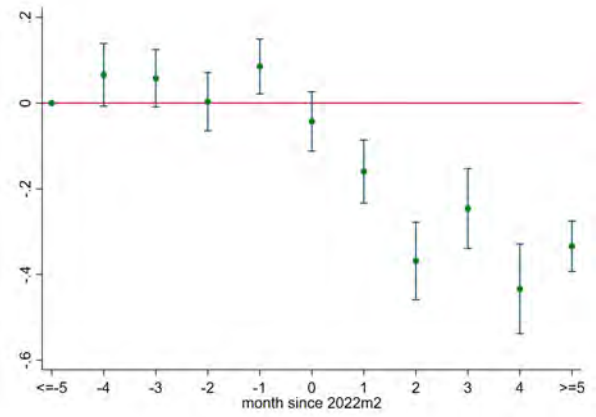
(c) SWIFT Sanction 2 on Russian Import from West



(d) SWIFT Sanction 2 on Russian Import from Non-West



(e) Western Banks' Withdrawal on Russian Import from West



(f) Western Banks' Withdrawal on Russian Import from Non-West

Notes: This figure shows Russian import's dynamic responses to SWIFT sanctions and the withdrawal of Western major banks from Russia at the bank-product-country level.

4.4 The Dynamic Effects

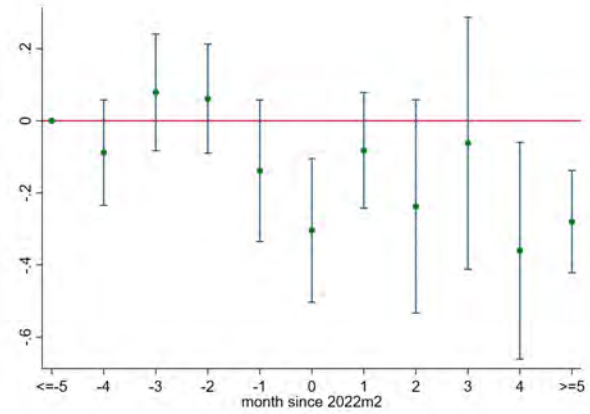
Figure 3 illustrates the dynamic effects of the three sanctions on Russia's imports from Western and non-Western partners. Period 0 corresponds to one month before the respective sanction was imposed. Months "≤ -5" are grouped into a single bin and serve as the baseline. The first two subfigures, (a) and (b). depict the impact of the first-round SWIFT sanctions. Russian imports remain stable before implementation but show a significant decline immediately afterward, suggesting that these sanctions effectively disrupted import flows. The impact on imports from Western partners is more pronounced than that on imports from non-Western partners, and the longer-term effects for non-Western partners tend to fade over time. Subfigure (c) and (d) focus on the second-round SWIFT sanctions, which mainly targeted Sberbank, the largest bank in Russia. Notably, there are signs of anticipation effects prior to the sanctions' formal implementation, likely due to widespread discussions and expectations surrounding Sberbank's inclusion in the sanctions. The disruption to imports from non-Western countries is relatively short-lived, in contrast with imports from Western countries. The third subfigure examines the withdrawal of Western banks, revealing an immediate and sharp drop in imports. This effect is more pronounced and sustained compared to the SWIFT sanctions, reflecting the critical role of foreign banks in facilitating Russian trade. Together, the figures demonstrate that Russian imports were significantly affected by all three measures related to banks in Russia, with varying timing and intensity, influenced by both direct impacts and market anticipation.

Figure 4 illustrates the dynamic effects of financial sanctions on Russian exports. The first two subfigures depict the impact of the first-round SWIFT sanctions. Following their implementation, exports to Western partners begin to decline, whereas exports to non-Western partners do not exhibit such significant changes. Subfigures (c) and (d) examine the second-round SWIFT sanctions, revealing potential anticipation effects, as export reductions appear to commence before the official start date. This decline continues after implementation, indicating a sustained impact. The effects on exports to non-Western partners are also smaller in magnitude compared with those to Western partners. Finally, the last two subfigures focus on the withdrawal of Western banks from Russia, which shows an immediate and pronounced negative effect on exports that persists in subsequent months. Overall, these graphs highlight the sequential and compounding nature of the sanctions' effects, with varying magnitudes and timings of export disruptions.

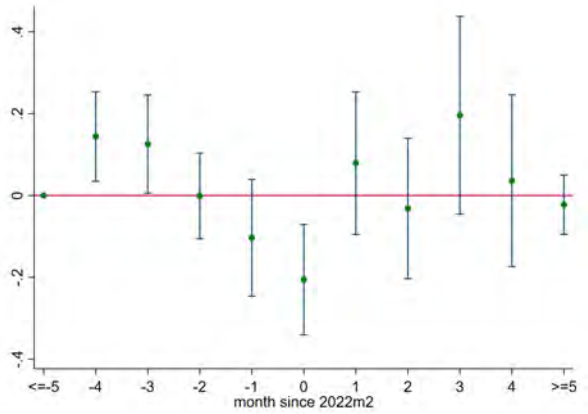
4.5 Extensive vs. Intensive Margins

So far the discussed effects are evaluated at the bank-country-product-month level. Next, we discern the impacts for the extensive margin and intensive margin. For extensive margin, we count

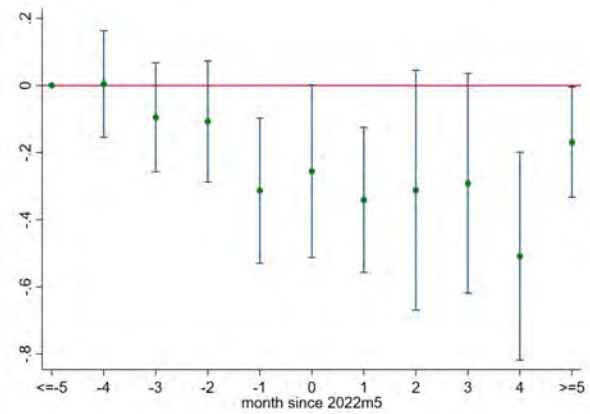
Figure 4: Russian Export Value Response to Financial Sanctions



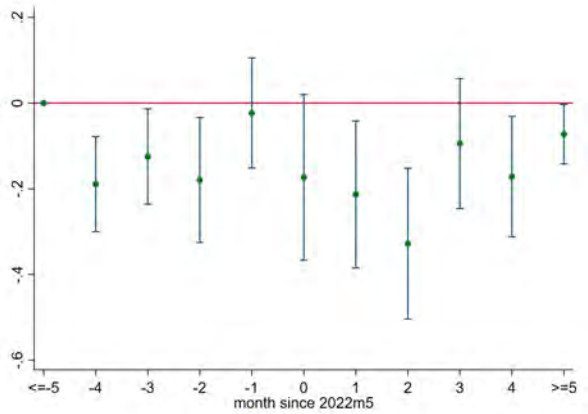
(a) SWIFT Sanction 1 on Russian Export to West



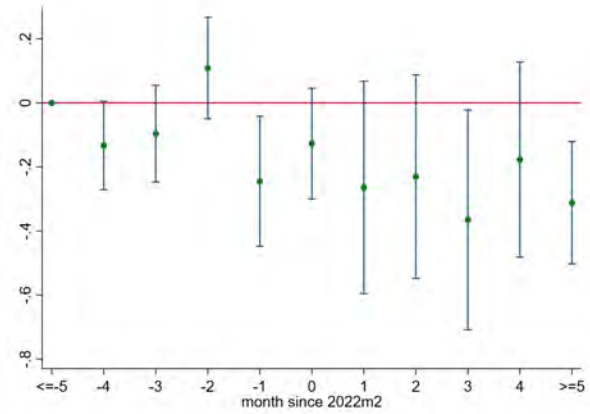
(b) SWIFT Sanction 1 on Russian Export to Non-West



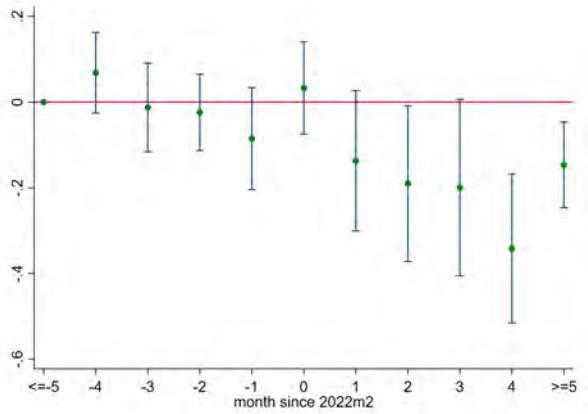
(c) SWIFT Sanction 2 on Russian Export to West



(d) SWIFT Sanction 2 on Russian Export to Non-West



(e) Western Banks' Withdrawal on Russian Export to West



(f) Western Banks' Withdrawal on Russian Export to Non-West

Notes: This figure shows Russian export's dynamic responses to SWIFT sanctions and the withdrawal of Western major banks from Russia at the bank-product-country level.

the number of Russian import and export firms for each bank-country-product-month observation. For intensive margin, we will examine firm-country-product-month level response to sanctions on banks.

Table 11 presents the effects of the two rounds of SWIFT sanctions and the withdrawal of Western banks on the number of Russian firms engaged in import and export activities. Columns (1) through (4) focus on the number of import firms, while columns (5) through (8) examine export firms, with a distinction between firms trading with Western and non-Western countries.

In Column (1), the first-round SWIFT sanctions reduce the total number of Russian import firms by 4.49%(=1-exp(-0.048)). The second-round sanctions result in a more significant decline of 13.3%(=1-exp(-0.143)), and the withdrawal of Western banks leads to the largest reduction of 17.9%(=1-exp(-0.197)). Column (2) reveals that import firms trading specifically with Western countries exhibit stronger response. These firms experience a larger drop of 12.1% (=1-exp(-0.129)) following the first-round sanctions, a massive decline of 29.2%(=1-exp(-0.346)) after the second-round sanctions, and a 25.9%(=1-exp(-0.300)) decrease due to Western banks' withdrawal. The interaction terms between sanctions and non-West country dummies have positive and statistically significant point estimates, indicating a muted extensive margin response for Russian import from non-West countries. Column (3), which focuses solely on firms trading with Western countries, confirms these results. Column (4) shifts focus to import firms trading with non-Western countries. Unlike their Western counterparts, non-Western firms demonstrate some resilience, with the first-round sanctions increasing firm numbers by 2.74%(=exp(0.027)-1) and the second round leading to a 5.02%(=exp(0.049)-1) increase. However, the withdrawal of Western banks causes a small but statistically significant decrease of 5.07% (=1-exp(-0.052)).

Columns (5)-(8) analyze the percentage changes in export firms. Column (5) shows that the first-round SWIFT sanctions reduce the total number of export firms by 3.14%(=1-exp(-0.032)) , while the second-round sanctions cause a larger decline of 8.15%(=1-exp(-0.085)). The impact of Western bank withdrawal is slightly smaller, at 5.54%(=1-exp(-0.057)). Column (6) highlights export firms trading with Western countries. The first-round sanctions lead to an 10.6%(=1-exp(-0.112)) decline, the second-round sanctions result in a 15.6%(=1-exp(-0.170)) reduction, and the Western banks' withdrawal causes a smaller decline of 5.92%(=1-exp(-0.061)). These effects are mirrored in column (7), which isolates Russian exports to Western countries. Column (8) focuses on export firms trading with non-Western countries. The first-round sanctions have no significant effect, while the second-round sanctions reduce firm numbers by 6.29%(=1-exp(-0.065)). The withdrawal of Western banks leads to a reduction of 5.07%(=1-exp(-0.052)).

The above findings highlight that sanctions caused substantial disruptions in the number of

trading firms, especially those engaged in trade with Western countries. Import firms were more affected than export firms. Exporting firms to non-Western countries displayed significant resilience, with some even increasing their activities, particularly in imports, as they adjusted to the sanctions by pivoting to non-Western trade partners. The percentage change interpretation underscores the magnitude of these effects on trade firm dynamics.

Table 11: Effects of SWIFT Sanction and Western Banks' Withdrawal on Russian Trade Firm Number

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import				Russian Export			
	all sample		West	non-West	all sample		West	non-West
swift sanction 1	-0.048***	-0.129***	-0.129***	0.027***	-0.032***	-0.112***	-0.112***	-0.003
	(0.007)	(0.011)	(0.011)	(0.004)	(0.009)	(0.017)	(0.017)	(0.010)
swift sanction 2	-0.143***	-0.346***	-0.346***	0.049***	-0.085***	-0.170***	-0.170***	-0.065***
	(0.007)	(0.010)	(0.010)	(0.005)	(0.012)	(0.029)	(0.029)	(0.011)
West bank post war	-0.197***	-0.300***	-0.300***	-0.052***	-0.057***	-0.061*	-0.061*	-0.052***
	(0.008)	(0.011)	(0.011)	(0.007)	(0.012)	(0.034)	(0.034)	(0.011)
swift sanction 1* non-West		0.156***				0.108***		
		(0.011)				(0.020)		
swift sanction 2* non-West		0.395***				0.105***		
		(0.011)				(0.027)		
West bank post war *non-West		0.248***				0.009		
		(0.011)				(0.033)		
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	3059648	3059648	1966859	1092789	371288	371288	104979	266309
R^2	0.842	0.844	0.846	0.841	0.928	0.928	0.876	0.935

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table reports the responses of the numbers of Russian firms that import and export to two rounds' SWIFT sanctions and the withdrawal of Western major banks from Russia at the bank-product-country level.

Table 12 reports the intensive margin response, i.e., firm-level effects. In this context, only the trade response of continuing importers and exporters is captured, since zero trade observations at the firm-product-country level are automatically excluded from the regression because of the logarithmic transformation. Columns (1)-(4) analyze Russian imports, while columns (5)-(8) focus on exports, distinguishing between trade with Western and non-Western countries.

In Column (1), the first-round SWIFT sanctions significantly reduce Russian firms' imports by 3.54%(=1-exp(-0.036)), while the second-round sanctions show a smaller reduction of 1.49%(=1-exp(-0.015)), significant at the 10% level. The withdrawal of Western banks has the largest impact, reducing imports by 16.1%(=1-exp(-0.176)). Column (2) shows that the interaction with non-Western trade partners amplifies the negative effect of the first-round sanctions by an additional 4.02%(=1-exp(-0.041)), while non-Western firms benefit from the Western banks' withdrawal, off-

setting the impact by 8.33%(=exp(0.08)-1). Column (3) focuses on Western imports, which experience consistent reductions under the first-round 0.60%(=1-exp(-0.006)) and second-round sanctions 1.78%(=1-exp(-0.018)), though these are not statistically significant. The Western banks' withdrawal has a much larger and statistically significant effect, reducing imports by 18.2%(=1-exp(-0.201)). Non-Western imports, presented in Column (4), show that the first-round SWIFT sanctions reduce imports by 5.07%(=1-exp(-0.052)), while the second round has a smaller and statistically insignificant effect 1.39%(=1-exp(-0.014)). The Western banks' withdrawal reduces non-Western imports by 11.6%(=1-exp(-0.123)).

Columns (5)-(8) reveal that the sanctions have generally weaker and less significant effects on exports than on imports. Column (5) shows that the first-round SWIFT sanctions reduce exports by 3.73% (=1-exp(-0.038)), significant at the 10% level, while the second round has no significant impact. The Western bank withdrawal reduces exports by 5.35%(=1-exp(-0.055)).

Column (6) indicates that the first-round SWIFT sanctions reduce Western exports by 4.11%(=1-exp(-0.042)), while the second round shows a larger but statistically insignificant reduction of 1.69%(=1-exp(-0.017)). The Western banks' withdrawal has a significant negative effect on Western exports, reducing them by 12.7%(=1-exp(-0.136)). Column (7) confirms the decline for Russian firms' exports to Western countries, with similar magnitudes. For exports to non-Western (Column (8)), the first-round sanctions reduce exports by 3.82%(=1-exp(-0.039)), while the second round and Western banks' withdrawal have negligible impacts.

Overall, we find that the extensive margin response is overall much larger than the intensive margin for SWIFT sanctions. Major Western banks' withdrawal from Russia produced similar impacts at the extensive and intensive margin. And despite that in the intensive margin Russian import from non-Western countries show relatively higher response than Western countries, the extensive margin responses for non-Western countries are much smaller than Western countries.

Table 12: Effects of SWIFT Sanctions and Western Banks' Withdrawal on Russian Firms' Trade

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian import				Russian export			
	all sample		West	Non-West	all sample		West	Non-West
swift sanction 1	-0.036***	-0.009	-0.006	-0.052***	-0.038*	-0.042	-0.037	-0.039
	(0.008)	(0.013)	(0.013)	(0.011)	(0.023)	(0.042)	(0.043)	(0.024)
swift sanction 2	-0.015*	-0.019	-0.018	-0.014	0.002	-0.017	-0.024	0.008
	(0.007)	(0.013)	(0.013)	(0.009)	(0.026)	(0.044)	(0.045)	(0.029)
West bank post war	-0.176***	-0.202***	-0.201***	-0.123***	-0.055*	-0.136*	-0.149**	-0.031
	(0.011)	(0.013)	(0.013)	(0.018)	(0.031)	(0.074)	(0.075)	(0.031)
swift sanction 1* non-West		-0.041**				0.007		
		(0.017)				(0.044)		
swift sanction 2* non-West		0.008				0.025		
		(0.015)				(0.050)		
West bank post war *non-West		0.080***				0.101		
		(0.023)				(0.076)		
Product-Firm-Country f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Bank-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	6704672	6704672	4308768	2395534	893825	893825	214820	678580
R^2	0.830	0.830	0.836	0.810	0.921	0.921	0.937	0.911

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This table reports Russian import and export responses to two rounds' SWIFT sanctions and the withdrawal of Western major banks from Russia at the firm-product-country level.

5 Considering Trade Sanctions

5.1 Excluding Western Export Controlled and Import Banned Products

Relative to our baseline specification, we now drop export controlled and import banned goods by E.U. or U.S. between 2022 and 2023 and report the regression results in Tables 13 and 14.

In Table 13, we find that our baseline results are robust. SWIFT sanctions and Western banks' withdrawal from Russia significantly disrupts Russian imports and the effects are stronger for Russia import from Western countries. Moreover, the absolute values of the point estimates are mostly smaller than those in Table 5.

In the case of Russian exports shown in Table 14, we find that as the baseline results, the first-round SWIFT sanction and Western banks' withdrawal from Russia significantly decrease Russian exports and the effects are stronger for Russia exports to Western countries. The second-round SWIFT sanction had similar impacts on Russian exports to Western and non-Western countries. Moreover, while the magnitude of the point estimate for first-round SWIFT sanction's effects on Western countries is smaller than that in Table 5, the second-round SWIFT sanctions and Western

Table 13: Effects of SWIFT Sanctions and Western Banks' Withdrawal on Russian Import: Drop Western Export Controlled Goods

	(1)	(2)	(3)	(4)
	Russian Import			
	all sample		West	Non-West
swift sanction 1	-0.089***	-0.122***	-0.122***	-0.049**
	(0.023)	(0.039)	(0.039)	(0.025)
swift sanction 2	-0.175***	-0.380***	-0.380***	0.022
	(0.021)	(0.033)	(0.033)	(0.022)
West bank post war	-0.386***	-0.467***	-0.467***	-0.273***
	(0.028)	(0.037)	(0.037)	(0.034)
swift sanction 1* non-West		0.072		
		(0.045)		
swift sanction 2* non-West		0.403***		
		(0.037)		
West bank post war *non-West		0.193***		
		(0.050)		
Bank-Product-Country-Season f.e.	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y
Observations	1443356	1443356	907060	536296
R^2	0.862	0.862	0.868	0.834

Standard errors in parentheses clustered at the product level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This figure shows Russian import's responses to the two rounds' SWIFT sanctions and the withdrawal of Western major banks from Russia at the bank-product-country level with products that are not export controlled by E.U. and U.S.

banks' withdrawal from Russia produced larger negative impacts on non-trade-sanctioned Russian exports to the Western countries.

5.2 Controlling for Trade Sanctions

To simultaneously include both financial sanctions and trade sanctions in the same regression to facilitate comparison between them, we will first relax the fixed effects specified in the baseline setting. This is because in the baseline setting, we controlled for country-product-time fixed effects, which will absorb Western trade sanctions against Russia at the product level. We will substitute the more stringent country-product-time fixed effects by country-time fixed effects and add trade sanctions as additional explanatory variables.

Table 15 presents the joint effects of financial and trade sanctions on Russian imports, disaggregating the impact between trade with Western and non-Western countries. Columns (1)∼(3) examine imports from Western countries, while Columns (4)∼(6) focus on imports from non-

Table 14: Effects of SWIFT Sanctions and Western Banks' Withdrawal on Russian Export: Drop Western Import Banned Goods

	(1)	(2)	(3)	(4)
	Russian export			
	West		Non-West	
swift sanction 1	-0.140***	-0.322***	-0.322***	-0.072*
	(0.034)	(0.066)	(0.066)	(0.043)
swift sanction 2	-0.155***	-0.136	-0.136	-0.150***
	(0.042)	(0.089)	(0.089)	(0.044)
West bank post war	-0.144**	-0.194**	-0.194**	-0.127**
	(0.056)	(0.077)	(0.078)	(0.061)
swift sanction 1* non-West		0.250***		
		(0.084)		
swift sanction 2* non-West		-0.014		
		(0.094)		
West bank post war *non-West		0.067		
		(0.094)		
Bank-Product-Country-Season f.e.	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y
Observations	167113	167113	37223	129890
R^2	0.947	0.947	0.957	0.944

Standard errors in parentheses clustered at the product level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Notes: This figure shows Russian export's responses to the two rounds' SWIFT sanctions and the withdrawal of Western major banks from Russia at the bank-product-country level with products that are not import banned by E.U. and U.S.

Western countries. The analysis also incorporates interactions between financial sanctions (SWIFT sanctions and Western bank withdrawal) and trade sanctions (E.U. and U.S. export controls) in Columns (2),(3), (5) and (6).

The first-round SWIFT sanctions significantly reduce imports from both Western and non-Western countries. Imports from Western countries decline by 21.9%(=1-exp(-0.247)) in Column (1) and 18.1%(=1-exp(-0.200)) in Column (2). For non-Western countries, the reductions are smaller at 8.6%(=1-exp(-0.09)) in Column (4) and 8.0%(=1-exp(-0.083)) in Column (5). The second-round SWIFT sanctions have a larger negative effect on Western imports, with reductions of 26.7%(=1-exp(-0.31)) in Column (1) and 23.8%(=1-exp(-0.272)) in Column (2). However, the effects on non-Western imports are negligible and statistically insignificant. The withdrawal of Western banks leads to substantial reductions in imports from both regions. Western imports decrease by 42.5%(=1-exp(-0.554)) in column (1) and 38.8%(=1-exp(-0.443)) in Column (2), while non-Western imports decline by 29.5%(=1-exp(-0.350)) in Column (4) and 27.2%(=1-exp(-0.318)) in Column (5).

E.U. and U.S. export controls jointly reduce imports significantly from Western countries, with a decline of 33.6%(=1-exp(-0.409)) in Column (1) and 13.2%(=1-exp(-0.141)) in Column (2). Interestingly, imports from non-Western countries increase under these sanctions, rising by 34.3%(=exp(0.295)-1) in Column (4) and 36.1%(=exp(0.308)-1) in Column (5). When only E.U. export controls are applied, Western imports show smaller declines (13.0%=1-exp(-0.139)) in Column (1), with no significant impact in Column (2). Non-Western imports increase by 14.5%(=exp(0.135)-1) in Column (4) and 12.5%(=exp(0.118)-1) in Column (5). U.S.-specific export controls cause a decline of 22.7%(=1-exp(-0.257)) in Western imports in column (1), but no significant impact is seen in Column (2). Non-Western imports rise by 8.32%(=exp(0.08)-1) in Column (4) and 13.9%(=exp(0.13)-1) in Column (5).

Columns (3) and (6) include stringent country-product-time fixed effects, directly controlling for demand, supply, and trade sanctions at this level. Given that trade sanction dummies vary at the product-time level, we need to exclude them from the specification. However, the interaction terms between financial and trade sanctions can be retained. Overall, the point estimates remain broadly consistent between Columns (2)-(3) and (5)-(6).

The interaction terms reveal that combining financial and trade sanctions intensifies the effects on Western imports but has minimal impact on non-Western imports. For instance, in Column (2), the first-round SWIFT sanctions combined with both E.U. and U.S. export controls reduce Western imports by an additional 23.7% (=1-exp(-0.271)), while the impact on non-Western imports is negligible. Similar patterns are observed for the second-round SWIFT sanction and Western banks'

withdrawal when interacting with export controls, further amplifying the declines in Western imports.

The results indicate that financial sanctions, particularly Western banks' withdrawal, have the most pronounced impact on reducing imports from Western countries. Trade sanctions alone also significantly reduce Western imports but tend to increase imports from non-Western countries, suggesting a redirection of trade flows. The interaction between financial and trade sanctions compounds the effects on Western imports, highlighting the complementary nature of these measures in disrupting trade. Russian imports from non-Western countries appear to be less affected, with some evidence of growth under trade sanctions, signaling a shift in sourcing strategies.

Table 16 examines the joint effects of financial sanctions (SWIFT sanctions and Western bank withdrawal) and trade restrictions (E.U. and U.S. import bans and U.S. tariffs) on Russian exports, disaggregating the impacts on trade with Western and non-Western countries. Columns (1)∼(3) focus on exports to Western countries, while Columns (4)∼(6) analyze exports to non-Western countries.

The first-round SWIFT sanctions have a limited and statistically insignificant impact on exports to Western countries, with reductions of 5.82%(=1-exp(-0.060)) in Column (1) and 4.88%(=1-exp(-0.050)) in Column (2). For non-Western countries, the effects vary, with a small and insignificant decline of 2.47%(=1-exp(-0.025)) in Column (4) and a statistically significant reduction of 6.20%(=1-exp(-0.064)) in Column (5). The second-round SWIFT sanctions have a stronger effect on Western exports, leading to reductions of 11.0%(=1-exp(-0.117)) in Column (1) and 9.88%(=1-exp(-0.104)) in Column (2). Their impact on non-Western exports is smaller and statistically insignificant, with changes of 2.27%(=1-exp(-0.023)) and 3.63%(=1-exp(-0.037)), respectively. The withdrawal of Western banks shows contrasting effects. For Western countries, it leads to insignificant changes with point estimates 0.034 in Column (1) and 0.017 in Column (2)). In contrast, non-Western exports decrease significantly, by 11.7%(=1-exp(-0.124)) and 12.5%(=1-exp(-0.134)), in Columns (4) and (5), respectively.

The combined E.U. and U.S. import bans have some negative impact on Russian exports to Western countries without statistical significance but substantially increase exports to non-Western countries, rising by 49.03% (=exp(0.399)-1) in Column (4) and 49.5%(= exp(40.2%)-1) in Column (5). The E.U.-specific import ban significantly reduces Western exports by 25.47%(=1-exp(-0.294)) in Column (1) and 26.07%(=1-exp(-0.302)) in Column (2) and slightly decreases non-Western exports by 5.54%(=1-exp(-0.057)) and 10.7%(=1-exp(-0.113)) in Columns (4) and (5), respectively. The U.S.-specific import ban has no significant impact on exports to either region. U.S. tariffs reduce exports to both Western and non-Western countries, with decreases

Table 15: The Joint Effects of Financial and Trade Sanctions on Russian Import

	(1)	(2)	(3)	(4)	(5)	(6)
	Russian Import					
	West			Non-West		
swift sanction 1	-0.247***	-0.200***	-0.218***	-0.090***	-0.083***	-0.068***
	(0.026)	(0.025)	(0.031)	(0.017)	(0.018)	(0.020)
swift sanction 2	-0.310***	-0.272***	-0.408***	0.008	0.005	0.047***
	(0.019)	(0.020)	(0.027)	(0.015)	(0.017)	(0.018)
West bank post war	-0.554***	-0.443***	-0.566***	-0.350***	-0.318***	-0.284***
	(0.024)	(0.024)	(0.028)	(0.026)	(0.026)	(0.028)
both E.U. and U.S. export control	-0.409***	-0.141***		0.295***	0.308***	
	(0.048)	(0.033)		(0.029)	(0.029)	
only E.U. export control	-0.139**	-0.013		0.135***	0.118***	
	(0.061)	(0.049)		(0.029)	(0.031)	
only U.S. export control	-0.257***	-0.143		0.080**	0.130***	
	(0.086)	(0.091)		(0.037)	(0.035)	
swift sanction 1*both E.U. and U.S. export control		-0.271***	-0.303***		-0.006	-0.004
		(0.056)	(0.072)		(0.041)	(0.044)
swift sanction 1*only E.U. export control		-0.142*	-0.166*		0.017	0.013
		(0.084)	(0.101)		(0.051)	(0.058)
swift sanction 1*only U.S. export control		-0.082	-0.136		-0.076*	-0.111**
		(0.070)	(0.088)		(0.043)	(0.047)
swift sanction 2*both E.U. and U.S. export control		-0.234***	-0.211***		-0.015	0.069
		(0.044)	(0.063)		(0.040)	(0.043)
swift sanction 2*only E.U. export control		-0.145**	-0.176**		0.138***	0.139***
		(0.061)	(0.083)		(0.044)	(0.049)
swift sanction 2*only U.S. export control		-0.071	-0.149**		-0.060	-0.064
		(0.058)	(0.067)		(0.044)	(0.049)
West bank post war*both E.U. and U.S. export control		-0.672***	-0.523***		-0.062	-0.037
		(0.072)	(0.090)		(0.060)	(0.060)
West bank post war*only E.U. export control		-0.281***	-0.323***		-0.046	-0.066
		(0.080)	(0.093)		(0.071)	(0.081)
West bank post war*only U.S. export control		-0.303***	-0.283***		-0.215***	-0.220***
		(0.058)	(0.066)		(0.061)	(0.057)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	N	Y	Y	N
Country-Product-Time f.e.	N	N	Y	N	N	Y
Observations	2410869	2410869	1966693	1274382	1274382	1092695
R^2	0.824	0.824	0.862	0.802	0.802	0.828

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

of approximately 15.72%(=1-exp(-0.171)) and 15.46%(=1-exp(-0.168)) in Western exports and 13.76%(=1-exp(-0.148)) and 13.2% in non-Western exports across the respective columns.

Columns (3) and (6) implement stringent country-product-time fixed effects to control for demand, supply, and trade sanctions. Because trade sanction dummies and U.S. tariffs vary at the product-time level, we exclude them from the specification while retaining their interactions with financial sanctions. The significant estimate differences between Columns (2)-(3) and (5)-(6) suggest that omitted country-product-time level factors may influence the results. The explanation likely lies in Russia's export composition being dominated by primary goods, which are highly vulnerable to various economic shocks. We prioritize the estimates from Columns (3) and (6), which include stringent fixed effects for financial sanctions and their interaction with trade sanctions. The estimates in the first 3 rows show that financial sanctions alone cause substantial export disruptions to Western countries, but exhibit markedly weaker impacts on Russian trade with non-Western nations. The financial sanctions $\times$ trade sanctions interactions show analogous effects.

The interaction terms indicate that combining financial and trade sanctions tend to amplify the effects on exports to Western countries. For example, the first-round SWIFT sanctions combined with both E.U. and U.S. import bans reduce Western exports by an additional 38.2%(=1-exp(-0.481)) in Column (3). (Note that Russian oil products were jointly banned by E.U. and U.S. after 2022 June.) In contrast, interactions with non-Western exports are generally weaker. For non-Western countries, the second-round SWIFT sanctions combined with only E.U. import bans even increase exports by 20.1% (=exp(0.183)-1) and the increase is statistically significant, as shown in Column (6).

Our findings show that the combined effect of financial and trade sanctions is greater than the sum of their individual impacts. This result is especially pronounced for Russian imports from Western countries. One possible explanation is that Western exporters may incur additional costs-such as lobbying expenses-to secure export licenses for regulated goods. When financial sanctions disrupt their Russian partners' access to banking services, these exporters may have less incentive to lobby, amplifying the interaction between financial and trade restrictions.

5.3 Quantifying the Amplification Effects

Next we quantify the effects of the interaction terms between financial sanctions and trade sanctions on Russian trade, in particular with Western partners. To facilitate additional quantification

Table 16: The Joint Effects of Financial and Trade Sanctions on Russian Export

	(1)	(2)	(3)	(4)	(5)	(6)
			Russian Export			
		West			Non-West	
swift sanction 1	-0.060	-0.050	-0.182***	-0.025	-0.064**	-0.038
	(0.043)	(0.051)	(0.062)	(0.023)	(0.030)	(0.046)
swift sanction 2	-0.117**	-0.104*	-0.176*	-0.023	-0.037	-0.060
	(0.046)	(0.059)	(0.093)	(0.021)	(0.028)	(0.046)
West bank post war	0.034	0.017	-0.245***	-0.124***	-0.134***	-0.205***
	(0.052)	(0.050)	(0.076)	(0.031)	(0.035)	(0.066)
both E.U. and U.S. import ban	-0.044	-0.080		0.399***	0.402***	
	(0.083)	(0.110)		(0.091)	(0.107)	
only E.U. import ban	-0.294***	-0.302***		-0.057**	-0.113***	
	(0.056)	(0.064)		(0.023)	(0.029)	
only U.S. import ban	-0.005	-0.003		-0.009	0.058	
	(0.103)	(0.124)		(0.093)	(0.157)	
U.S. tariff	-0.171*	-0.168*		-0.148**	-0.141**	
	(0.093)	(0.095)		(0.061)	(0.061)	
swift sanction 1*both E.U. and U.S. import ban		-0.481*	-0.524***		-0.010	-0.100
		(0.259)	(0.117)		(0.071)	(0.082)
swift sanction 1*only E.U. import ban		-0.040	0.216		0.125***	0.163**
		(0.111)	(0.156)		(0.045)	(0.071)
swift sanction 1*only U.S. import ban		-0.107	0.172		-0.049	0.140
		(0.166)	(0.229)		(0.188)	(0.212)
swift sanction 1*U.S. tariff		0.004	-0.016		0.001	-0.003
		(0.009)	(0.017)		(0.004)	(0.006)
swift sanction 2*both E.U. and U.S. import ban		0.320**	-0.102		-0.136	-0.190*
		(0.150)	(0.127)		(0.137)	(0.107)
swift sanction 2*only E.U. import ban		0.007	0.019		0.123***	0.183***
		(0.105)	(0.178)		(0.039)	(0.059)
swift sanction 2*only U.S. import ban		-0.060	0.223		-0.195	0.043
		(0.234)	(0.197)		(0.188)	(0.218)
swift sanction 2*U.S. tariff		-0.008	-0.012		-0.007	-0.019***
		(0.009)	(0.015)		(0.005)	(0.007)
West bank post war*both E.U. and U.S. import ban		0.228	0.001		0.233	0.111
		(0.204)	(0.260)		(0.163)	(0.123)
West bank post war*only E.U. import ban		0.042	-0.327*		0.014	0.059
		(0.128)	(0.195)		(0.051)	(0.083)
West bank post war*only U.S. import ban		0.159	0.235		-0.111	0.252
		(0.266)	(0.382)		(0.151)	(0.171)
West bank post war*U.S. tariff		-0.001	0.011		0.001**	0.012
		(0.002)	(0.023)		(0.000)	(0.008)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	N	Y	Y	N
Country-Product-Time f.e.	N	N	Y	N	N	Y
Observations	232318	232318	104801	462873	462873	266151
R^2	0.930	0.930	0.959	0.914	0.914	0.945

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 17: The Effects of Financial Sanctions on Russian Import with Interaction Terms by Detailed Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.214***	-0.699***	-0.217***	-0.035	0.242**	-0.163**	-0.269**	-0.259***
	(0.033)	(0.191)	(0.071)	(0.022)	(0.119)	(0.075)	(0.121)	(0.065)
swift sanction 2	-0.476***	-1.467***	0.224***	0.059***	-0.015	-0.017	-0.342**	0.022
	(0.030)	(0.173)	(0.062)	(0.021)	(0.118)	(0.090)	(0.143)	(0.051)
West bank post war	-0.519***	-1.567***	-1.045***	-0.390***	-0.051	0.219***	0.301*	-0.291***
	(0.027)	(0.173)	(0.075)	(0.031)	(0.104)	(0.080)	(0.160)	(0.064)
swift sanction 1*both E.U. and U.S. export control	-0.312***	-0.251	-0.295***	-0.047	0.686**	0.770***	0.118	-0.644***
	(0.088)	(0.472)	(0.105)	(0.041)	(0.328)	(0.124)	(0.202)	(0.180)
swift sanction 1*only E.U. export control	-0.156	-0.459	-0.181	0.020	-0.440	0.422***	0.238*	-0.519**
	(0.110)	(0.513)	(0.173)	(0.060)	(0.267)	(0.156)	(0.144)	(0.246)
swift sanction 1*only U.S. export control	-0.172*	0.092	0.013	-0.070	-0.321	-0.333	0.359	-0.327***
	(0.096)	(0.354)	(0.137)	(0.051)	(0.663)	(0.204)	(0.637)	(0.126)
swift sanction 2*both E.U. and U.S. export control	-0.349***	0.072	0.039	0.129***	0.546	0.183	0.242	-0.732***
	(0.082)	(0.318)	(0.095)	(0.045)	(0.426)	(0.145)	(0.213)	(0.173)
swift sanction 2*only E.U. export control	-0.310***	1.055***	0.115	0.127**	0.267	0.408**	1.297	-0.162
	(0.094)	(0.325)	(0.119)	(0.054)	(0.517)	(0.200)	(1.296)	(0.226)
swift sanction 2*only U.S. export control	-0.145*	-0.183	-0.194	-0.019	-0.316	0.019	0.093	-0.493***
	(0.080)	(0.303)	(0.152)	(0.048)	(0.232)	(0.180)	(0.515)	(0.157)
West bank post war*both E.U. and U.S. export control	-0.552***	-0.967**	-0.366**	-0.089	0.784*	0.454***	-0.112	-0.773***
	(0.099)	(0.438)	(0.169)	(0.065)	(0.445)	(0.119)	(0.237)	(0.255)
West bank post war*only E.U. export control	-0.303***	-0.748*	-0.338*	-0.041	-0.328	0.180	0.030	-0.796**
	(0.097)	(0.431)	(0.196)	(0.089)	(0.466)	(0.153)	(0.166)	(0.319)
West bank post war*only U.S. export control	-0.264***	-0.798***	-0.367*	-0.182***	-0.898***	0.171	-0.569	-0.895***
	(0.068)	(0.237)	(0.223)	(0.068)	(0.275)	(0.143)	(0.854)	(0.147)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Product-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1684574	69535	212584	762313	21452	106327	12839	189764
R^2	0.861	0.852	0.868	0.799	0.885	0.859	0.835	0.900

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

exercises, we formally define the empirical setting

$$\ln y_{bckt} = \alpha_{bckm} + \delta_{ckt} + \beta_1 * SWIFT_{1bt} + \beta_2 * SWIFT_{2bt} + \beta_3 * West\_bank_b * Post\_war_t +$$
$$\phi_{11} * SWIFT_{1bt} * Joint\_ban_{kt} + \phi_{12} * SWIFT_{1bt} * EU\_ban_{kt} + \phi_{13} * SWIFT_{1bt} * US\_ban_{kt} +$$
$$\phi_{21} * SWIFT_{2bt} * Joint\_ban_{kt} + \phi_{22} * SWIFT_{2bt} * EU\_ban_{kt} + \phi_{23} * SWIFT_{2bt} * US\_ban_{kt} +$$
$$\phi_{31} * West\_bank_b * *Post\_war_t * Joint\_ban_{kt} + \phi_{32} * West\_bank_b * Post\_war_t * EU\_ban_{kt} +$$
$$\phi_{33} * West\_bank_b * Post\_war_t * US\_ban_{kt} + \epsilon_{bckt} \quad (2)$$

where the "Joint_ban" denotes trade restrictions (export controls or import bans) by both E.U. and U.S., "EU_ban" denotes trade restrictions only by E.U. and "US_ban" denotes trade restrictions only by U.S. Other notations follow the definition in equation 1. We run the regressions by trade mode (import or export) and by 8 trading partner (groups).

The regression results are reported in Table 17 and 18. The first three rows of estimates in both tables indicate that financial sanctions generally impose larger negative effects on Russia's trade with Western countries (Columns 1-3) compared to non-Western countries (Columns 4-8).

Table 18: The Effects of Financial Sanctions on Russian Export with Interaction Terms by Detailed Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian export							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.035	-0.340***	-0.337*	0.241	0.354	0.125	-0.000	-0.141**
	(0.099)	(0.076)	(0.191)	(0.182)	(0.414)	(0.187)	(0.094)	(0.067)
swift sanction 2	-0.184	-0.127	-0.059	-0.042	0.003	0.030	0.010	-0.144**
	(0.127)	(0.121)	(0.198)	(0.171)	(0.563)	(0.180)	(0.068)	(0.059)
West bank post war	-0.279***	-0.264	0.045	0.118	0.382	-0.202	-0.235***	-0.218**
	(0.086)	(0.251)	(0.391)	(0.251)	(0.574)	(0.181)	(0.088)	(0.089)
swift sanction 1*both E.U. and U.S. import ban	-0.947***	-0.928***	-0.141	-0.121	-0.122	-1.118***	0.344*	-0.111
	(0.220)	(0.117)	(0.178)	(0.244)	(0.445)	(0.276)	(0.209)	(0.198)
swift sanction 1*only E.U. import ban	-0.044	0.397	0.395	-0.129	-0.631	-0.545	0.167*	0.250**
	(0.162)	(0.298)	(0.280)	(0.188)	(0.685)	(0.338)	(0.099)	(0.109)
swift sanction 1*only U.S. import ban	-0.009	-0.025	0.319	0.105	-0.726*	0.148	-1.058**	0.117
	(0.294)	(0.265)	(0.273)	(0.285)	(0.402)	(0.338)	(0.457)	(0.293)
swift sanction 1*U.S. tariff	0.000	-0.032	0.009	-0.033	-0.214***	0.007	0.008	-0.000
	(0.024)	(0.022)	(0.035)	(0.066)	(0.077)	(0.051)	(0.016)	(0.008)
swift sanction 2*both E.U. and U.S. import ban	0.255	0.000	-0.819***	-0.449	-0.252	-0.804***	-0.198*	0.202
	(0.162)	(.)	(0.208)	(0.334)	(0.599)	(0.226)	(0.109)	(0.177)
swift sanction 2*only E.U. import ban	-0.197	-0.626*	0.211	0.054	-0.838	-0.553	0.110	0.433***
	(0.182)	(0.322)	(0.400)	(0.205)	(0.647)	(0.347)	(0.080)	(0.085)
swift sanction 2*only U.S. import ban	0.177	-1.636***	0.150	0.112	0.000	0.000	-0.447	0.280
	(0.267)	(0.138)	(0.360)	(0.348)	(.)	(.)	(0.423)	(0.215)
swift sanction 2*U.S. tariff	-0.028	0.040*	0.017	-0.031	-0.272**	0.013	-0.016	-0.019**
	(0.019)	(0.022)	(0.045)	(0.032)	(0.124)	(0.051)	(0.011)	(0.010)
West bank post war*both E.U. and U.S. import ban	-0.168	0.000	-0.010	0.239	0.225	0.509	-0.322***	-0.091
	(0.249)	(.)	(0.365)	(0.299)	(0.392)	(0.539)	(0.110)	(0.147)
West bank post war*only E.U. import ban	-0.130	-1.218***	-0.470	0.124	-0.258	0.447	0.089	-0.071
	(0.192)	(0.278)	(0.360)	(0.394)	(0.839)	(0.285)	(0.096)	(0.124)
West bank post war*only U.S. import ban	0.248	0.000	-0.651	0.060	0.000	0.485	0.424	0.136
	(0.381)	(.)	(0.443)	(0.353)	(.)	(0.528)	(0.333)	(0.191)
West bank post war*U.S. tariff	0.028	0.013	-0.053	-0.003	-0.118*	-0.023	0.024**	0.004
	(0.022)	(0.034)	(0.093)	(0.066)	(0.061)	(0.092)	(0.012)	(0.011)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	78020	17416	9365	16566	2904	6651	93817	146213
R^2	0.960	0.941	0.923	0.905	0.917	0.963	0.932	0.943

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The estimated coefficients for the interaction terms in the first three columns are predominantly negative. This aligns with our earlier discussion on the amplifying effects between trade sanctions and financial sanctions.

To quantify these effects more transparently, we compare Russia's trade flows with Western countries under two counterfactual scenarios: (1) financial sanctions implemented in isolation, and (2) financial sanctions combined with trade sanctions.

Using Russian import change from Western countries as the example, the first scenario is calculated using the following formula

$$Import\ Change_1 = \sum_{B,C} \sum_{j=1,2,3} Import_{BCj,2021} * [exp(\hat{\beta}_j) - 1] \tag{3}$$

where Bank types (B) are classified as: (i) SWIFT-sanctioned (first round), (ii) SWIFT-sanctioned (second round), or (iii) Western banks. Country groups (C) include: (i) E.U., (ii) U.S., and (iii) other Western nations. The 2021 trade volumes serve as our pre-sanction reference point. For the second scenario with consideration of the interaction terms between financial and trade sanctions, the corresponding import change from Western countries is

$$Import\ Change_2 = \sum_{B,C} \sum_{j=1,2,3} \sum_{s} Import_{BCjs,2021} * [exp(\hat{\beta}_j + \hat{\phi}_{js}) - 1] \tag{4}$$

where The variable s categorizes products into four groups based on trade sanctions: (i) those jointly export-controlled by the E.U. and U.S., (ii) those controlled solely by the E.U., (iii) those controlled solely by the U.S., and (iv) all other products. When s is the fourth category, $\hat{\phi_{js}}$ is set to 0 directly.

For the calculation of export change with Western countries due to financial sanctions without and with the consideration of the interaction terms with trade sanctions, we proceed similarly.

Table 19 presents the results. Our results indicate that financial sanctions alone lead to a significant reduction in Russia's trade with Western countries, with imports declining by $44.71 billion and exports falling by $19.28 billion. Importantly, our analysis also reveals significant interaction effects between financial and trade sanctions, amplifying the overall trade reduction. The combined impact exceeds the sum of individual effects, with interaction terms contributing an additional $11.72 billion decline in imports and $7.82 billion in exports (see final row in the table).

Table 19: The Amplification Effects (annualized, billion USD) of the Interaction between Financial and Trade Sanctions for Russian Trade with Western Countries

Trade Change due to	Russian Import	Russian Export
(1) financial sanctions only	-44.71	-19.28
(2) financial sanctions and its interaction with trade sanctions	-56.13	-27.10
(2)-(1)	-11.72	-7.82

Notes: This table shows the impact of financial sanctions on Russian trade with Western countries, both without and with interaction effects from trade sanctions.

6 Bypassing Financial Sanctions

Our previous analysis has shown that financial sanctions, in particular, SWIFT sanctions have a muted impacts on non-Western countries than Western countries. We speculate that Russian trade with non-Western trading partners may have found alternative ways to facilitate transactions to mitigate sanctions' impacts. We will investigate the possibility of alternative methods. In particular, we examine the role of increasing use of partner countries' currency. Since the war between Russia and Ukraine, numerous reports had mentioned countries like China shifted to alternative payment system such as CIPS (cross-border interbank payment system) to transact in Renminbi to circumvent Western sanctions on Russian banking system. It is important to note that although CIPS incorporates the SWIFT messaging system, it also operates its own independent messaging system.

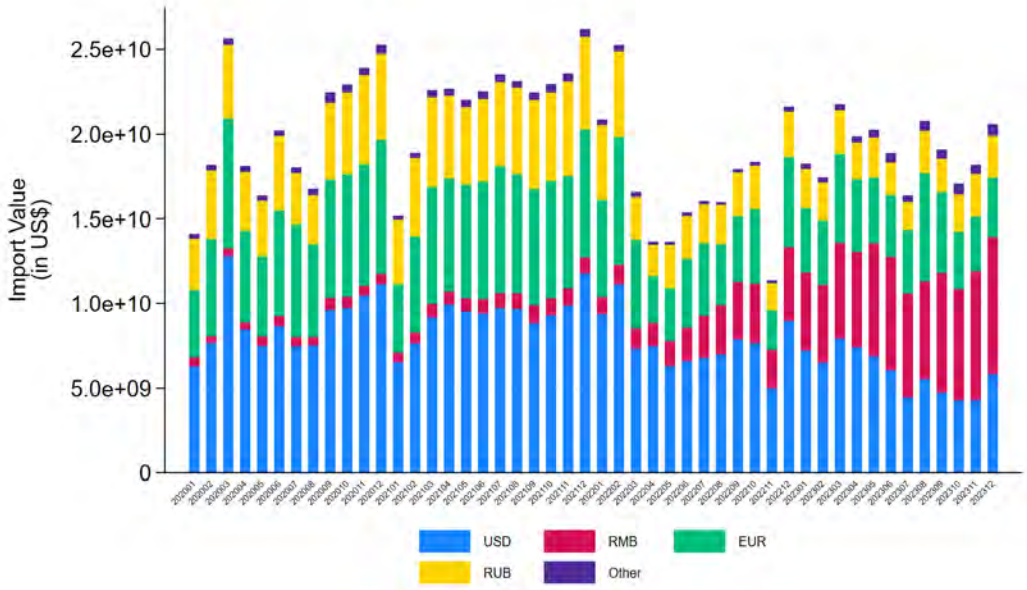
We being with reporting patterns of Russian import and export invoicing currency use. We document that Russian trade had significantly shifted away from US dollars and Euros.

Figure 5 illustrates the dynamics of Russian imports over time, disaggregated by the currency used for transactions (USD, EUR, RUB, RMB, and other currencies). The period covers January 2020 to December 2023. Prior to 2022, USD and EUR dominate as the primary currencies for Russian imports, with RUB and RMB playing minor roles. However, starting from early 2022, coinciding with the imposition of Western sanctions, there is a notable decline in the use of USD and EUR. Simultaneously, there is a significant increase in the share of RMB (Chinese yuan), signaling a shift in currency preferences. But the overall use of Ruble has not increased.

Figure 6 presents Russian import dynamics by currency use across eight key trading partners or regions, segmented into subfigures: E.U., U.S., Other West, China, India, Turkey, CIS, and Other Non-West. The composition of currencies (USD, EUR, RUB, RMB, and others) highlights significant shifts in trade financing preferences, particularly after 2022. For imports from the E.U. (subfigure a) and the U.S. (subfigure b), the use of USD and EUR dominates pre-2022 but declines sharply thereafter, reflecting the impact of Western sanctions. Imports from China (subfigure d) show a dramatic rise in RMB usage starting in 2022, indicating a shift toward yuan-denominated transactions. Similarly, imports from India (subfigure e), Turkey (subfigure f), CIS (subfigure g), and Other Non-West regions (subfigure h) increasingly rely on non-USD and non-EUR currencies. In contrast, Other West partners (subfigure c) show a more modest shift away from USD and EUR. The subfigures collectively demonstrate Russia's adaptation to sanctions through diversification of trade currencies and a pivot toward non-Western partners.

Figure 7 illustrates the dynamics of Russian export values by currency (USD, EUR, RUB, RMB, and others) from January 2020 to December 2023. Prior to 2022, USD (blue) and EUR (green)

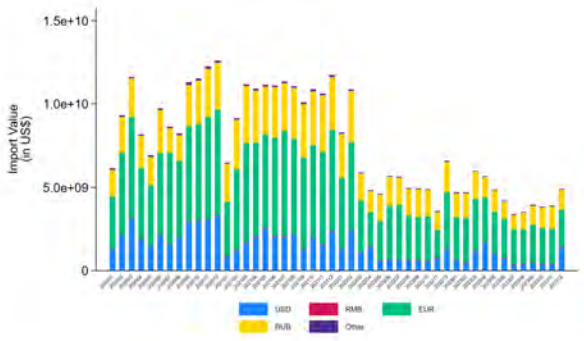
Figure 5: Russian Import Currency Dynamics



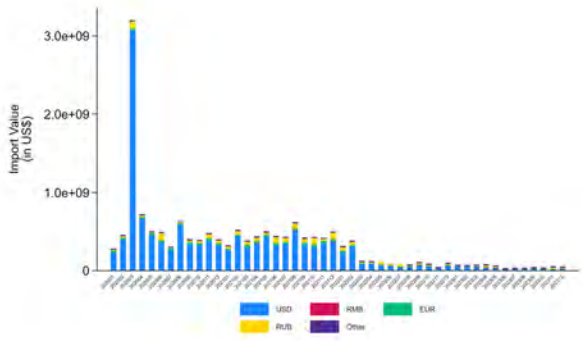
were the dominant currencies used in export transactions, consistently accounting for the majority of export values. Following the imposition of Western sanctions in early 2022, there is a marked decline in the use of USD and EUR, reflecting the restrictions on financial transactions and a shift in Russia's trade settlement patterns. In contrast, the use of RMB, in particular, shows steady growth after the war, while the use of Ruble and "other" currencies remains relatively stable at a low level.

Figure 8 illustrates Russian export currency dynamics across eight trading regions or partners: the E.U., U.S., Other West, China, India, Turkey, CIS, and Other Non-West countries. Subfigures (a), (b), and (c) show that exports to Western partners (E.U., U.S., and Other West) were predominantly settled in USD and EUR prior to 2022. However, following the imposition of Western sanctions, the use of these currencies sharply declines, particularly in exports to the E.U. and the U.S., with a minor shift toward RUB and RMB for exports to these regions. In contrast, subfigures (d) through (h) highlight a diversification of currency use in exports to non-Western partners. Exports to China (subfigure d) show a dramatic rise in RMB use post-2022, overtaking other currencies in prominence. Exports to India (subfigure e) remain dominated by USD, but RUB gains some share after 2022. In Turkey (subfigure f) and CIS countries (subfigure g), RUB becomes increasingly significant, reflecting regional integration and adaptation to sanctions. Exports to Other Non-West partners (subfigure h) display a mixed currency composition, with RUB and RMB playing a more prominent role after 2022. Collectively, the subfigures depict Russia's strategic pivot away from Western currencies in response to sanctions, with RUB and RMB

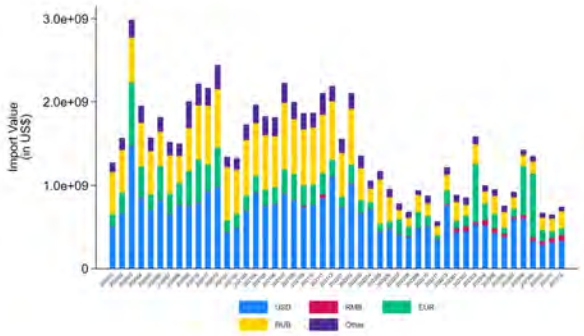
Figure 6: Russian Import Currency Dynamics by Partners



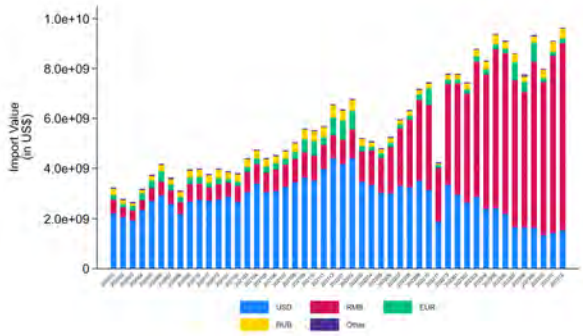
(a) E.U.



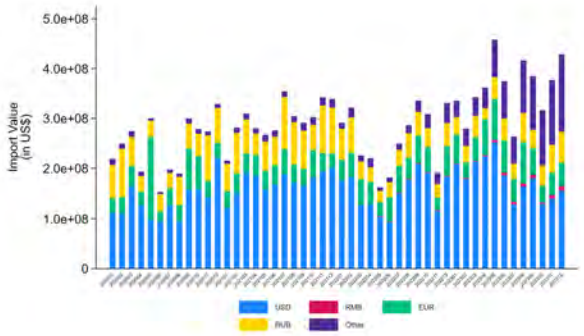
(b) U.S.



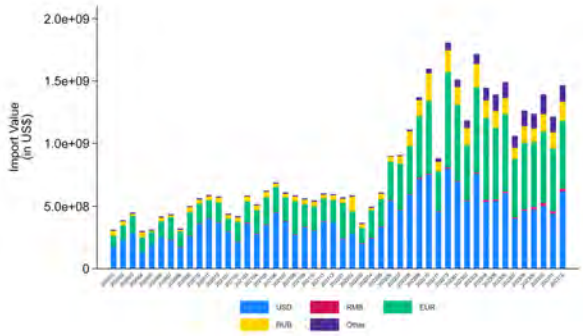
(c) Other West



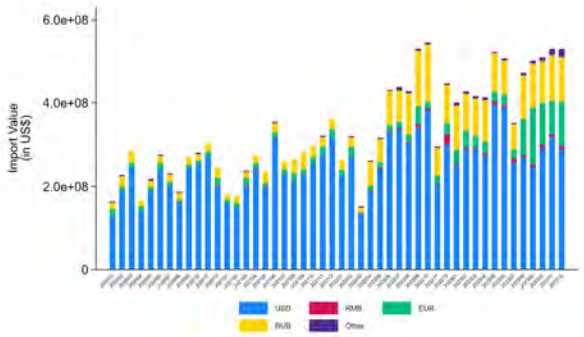
(d) China



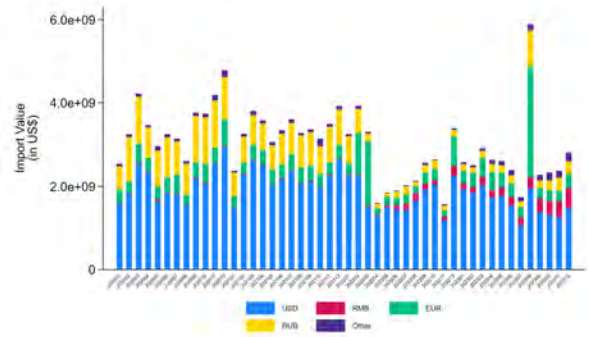
(e) India



(f) Turkey



(g) CIS

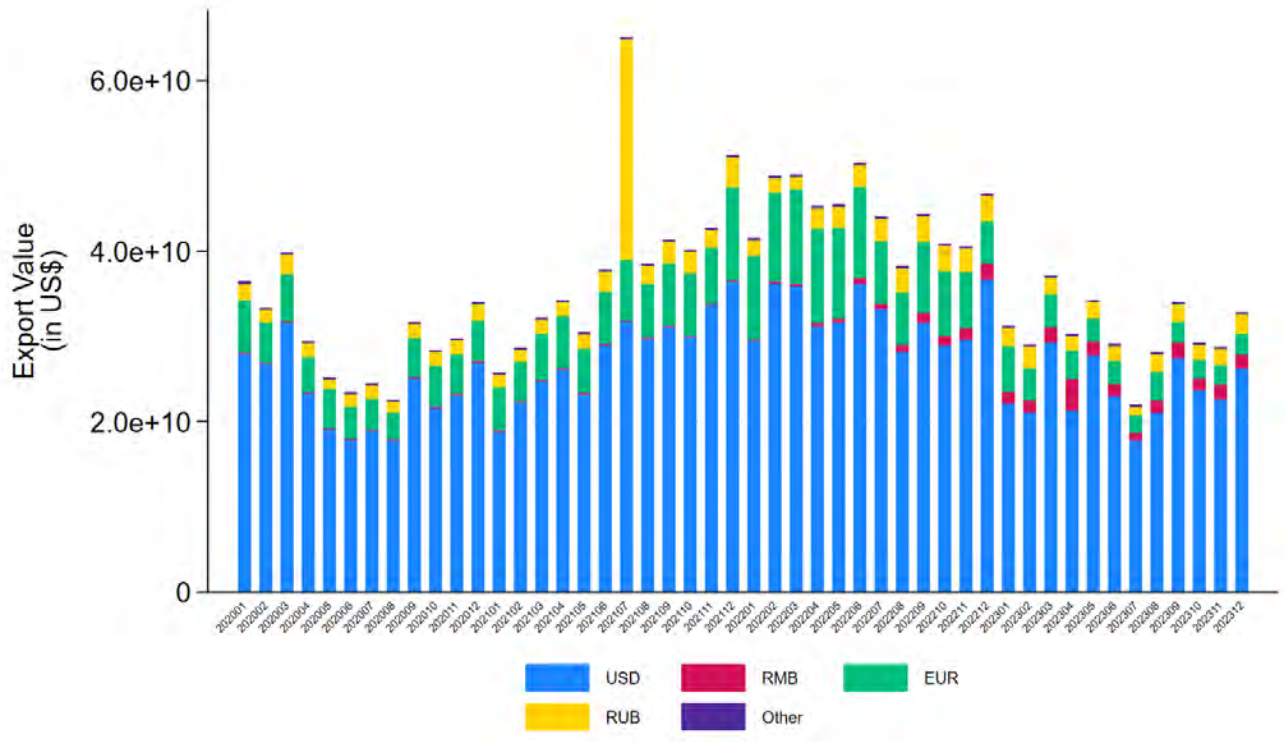


(h) Other Non-West

becoming key currencies for export transactions, particularly with non-Western partners.

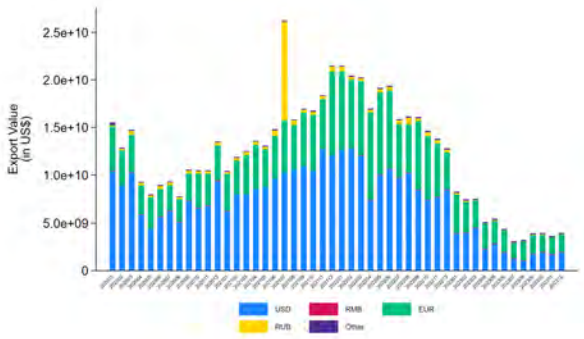
It is also worthwhile to emphasize the potential differences between invoicing and settlement currencies. In our data, only the invoicing currency is observed, not the settlement currency. However, for the purpose of bypassing financial sanctions, the settlement currency is the more relevant measure. The pronounced shift toward RMB invoicing in Russian imports from China (which largely consist of manufactured goods) suggests that the settlement currency may have changed alongside the invoicing currency. In contrast, the relatively modest shift toward RMB invoicing in Russian exports to China (which are predominantly primary goods such as oil) does not necessarily imply that the change in settlement currency is also small. Indeed, according to public reports,[10] the renminbi was used to settle 75% of Russia's trade with China in the first half of 2023. This figure closely matches the share of imports invoiced in RMB in our data but substantially exceeds the corresponding share for exports. We therefore conjecture that a considerable portion of Russian exports to China may be settled in renminbi, even if the invoicing currency remains the U.S. dollar. In this sense, the import invoicing data provide a more accurate proxy for bypassing financial sanctions than the export invoicing data.

Figure 7: Russian Export Currency Dynamics

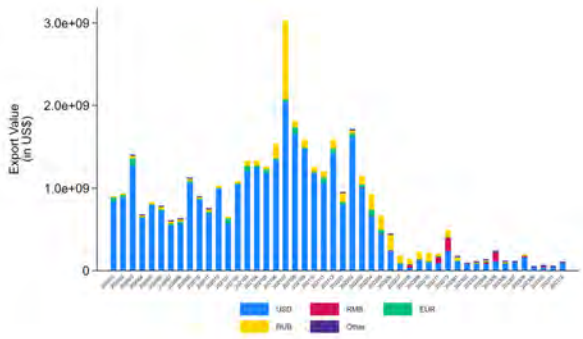


[10]See, e.g., https://markets.businessinsider.com/news/currencies/dedollarization-dollar-dominance-russia-china-ruble-yuan-war-in-ukraine-2023-9.

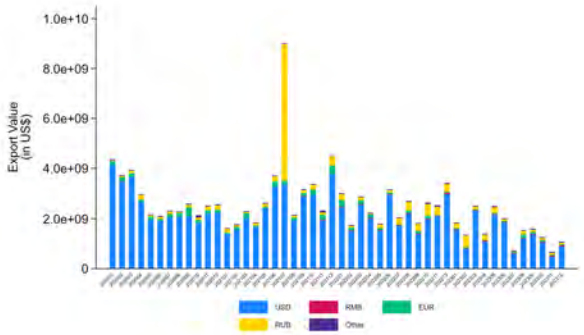
Figure 8: Russian Export Currency Dynamics by Partners



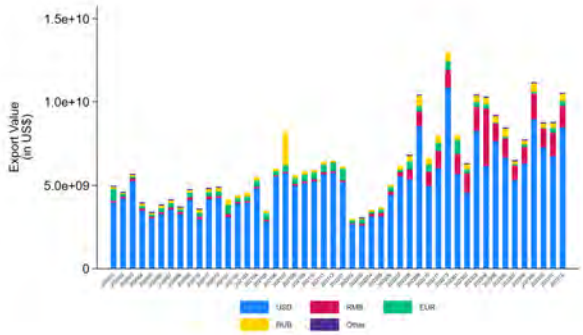
(a) E.U.



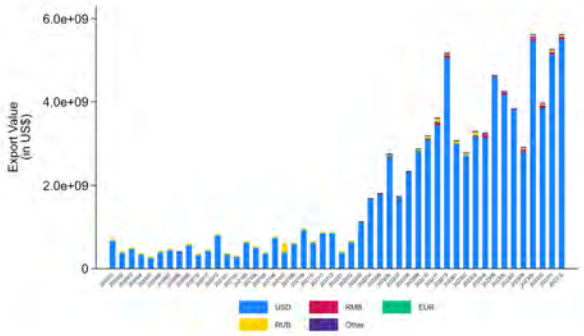
(b) U.S.



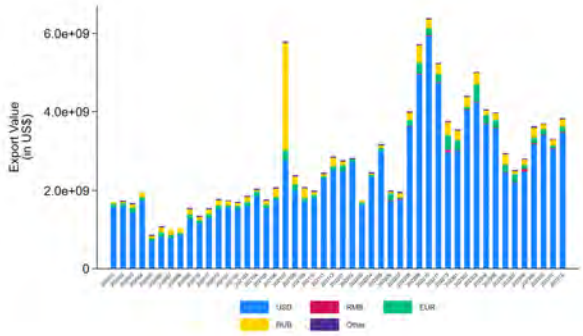
(c) Other West



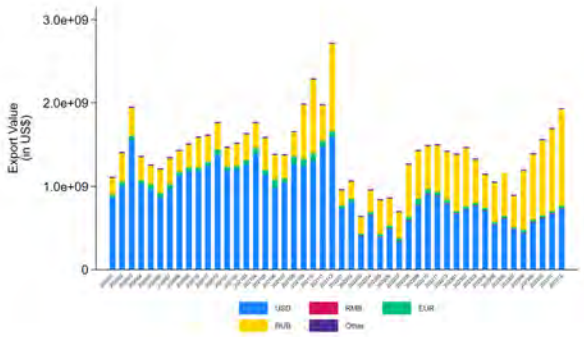
(d) China



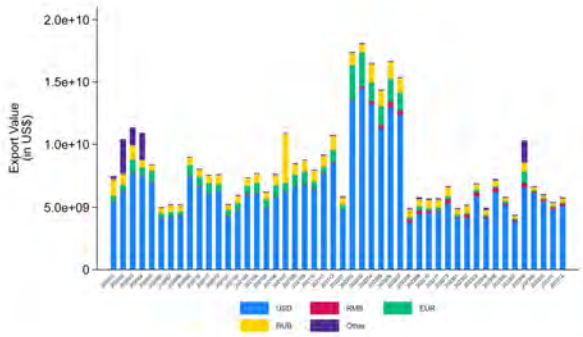
(e) India



(f) Turkey



(g) CIS



(h) Other Non-West

Table 20 examines the role of partner currency usage in mitigating the impacts of financial sanctions on Russian imports, with results segmented across different non-Western regions and trading partners: China, India, Turkey, CIS (Commonwealth of Independent States), and Other Non-West countries. The interaction terms highlight the mitigating role of partner currency shares in trade settlement. For instance, a higher share of partner currencies significantly offsets the negative impact of SWIFT sanctions. For non-Western imports, the interaction term for the first-round SWIFT sanctions and partner currency share suggests a positive offset of 2.35% (=(exp(0.211)-1)*10%) if the share of partner currency increases by 10 percentage points, and for the second-round sanctions, the offset rises to 3.47% (=(exp(0.298)-1)*10%). Similar patterns are observed for imports from China, with offsets of 1.89% (=(exp(0.173)-1)*10%) for the first-round sanctions and 3.62%(=(exp(0.309)-1)*10%) for the second round when the use of partner currency grows by 10 percentage points. The growing use of RMB also mitigates the negative impact of Western banks winding down their operations in Russia, with a offset of 1.14% (=(exp(0.108)-1)*10%). However, these interactions are generally not statistically significant for India, Turkey, and CIS countries. These results highlight that CIPS could be a potentially powerful tool for Russian firms to bypass financial sanctions when trading with China. Finally, partner currency share alone is associated with a mild negative impact on imports overall (2.7%).

Table 21 explores the role of partner currencies in mitigating the impacts of financial sanctions on Russian exports, disaggregated across non-Western trading partners: China, India, Turkey, CIS, and Other Non-West. Higher partner currency shares are shown to mitigate the negative impacts of financial sanctions overall (despite not statistically significant) and in some cases. As discussed earlier, the share of export invoicing currencies denominated in non-Western currencies may significantly underestimate their actual use for settlement, given the structure of Russian exports, which are primarily composed of primary goods.

Table 20: Using Partner Currency to Mitigate Financial Sanctions' Impacts on Russian Import

	(1)	(2)	(3)	(4)	(5)	(6)
	Russian Import					
	Non-West	China	India	Turkey	CIS	Other Non-West
swift sanction 1	-0.182***	-0.154***	0.206	-0.007	-0.253**	-0.441***
	(0.024)	(0.027)	(0.136)	(0.075)	(0.117)	(0.074)
swift sanction 2	-0.085***	-0.097***	-0.040	0.050	-0.330**	-0.158***
	(0.021)	(0.027)	(0.115)	(0.072)	(0.142)	(0.061)
West bank post war	-0.321***	-0.485***	-0.122	0.335***	0.294*	-0.545***
	(0.030)	(0.033)	(0.121)	(0.070)	(0.156)	(0.083)
swift sanction 1*partner cur sh	0.211***	0.173***	0.011	0.177	0.000	0.078
	(0.032)	(0.034)	(0.227)	(0.309)	(.)	(0.285)
swift sanction 2*partner cur sh	0.298***	0.309***	0.175	0.046	-1.270	-0.791**
	(0.030)	(0.034)	(0.265)	(0.542)	(1.690)	(0.346)
West bank post war*partner cur sh	-0.037	0.108**	-0.021	0.214	0.000	-0.210
	(0.045)	(0.047)	(0.322)	(0.494)	(.)	(0.248)
partner currency share	-0.027*	-0.036**	0.060	0.153	1.527	-0.149
	(0.015)	(0.015)	(0.133)	(0.104)	(1.622)	(0.092)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y
Observations	1092695	762313	21452	106327	12839	189764
R^2	0.828	0.799	0.885	0.858	0.835	0.900

Standard errors in parentheses clustered at the product level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 21: Using Partner Currency to Mitigate Financial Sanctions' Impacts on Russian Export

	(1)	(2)	(3)	(4)	(5)	(6)
	Russian Export					
	Non-West	China	India	Turkey	CIS	Other Non-West
swift sanction 1	-0.013	0.100	-0.506**	-0.131	0.077	-0.104**
	(0.033)	(0.126)	(0.235)	(0.169)	(0.054)	(0.049)
swift sanction 2	-0.074**	-0.069	-1.058***	-0.239*	-0.021	-0.102**
	(0.034)	(0.124)	(0.323)	(0.140)	(0.048)	(0.043)
West bank post war	-0.156***	0.247**	0.157	0.103	-0.135**	-0.241***
	(0.045)	(0.110)	(0.184)	(0.170)	(0.058)	(0.059)
swift sanction 1*partner cur sh	0.218	0.048	0.000	-8.292***	0.000	1.825***
	(0.210)	(0.262)	(.)	(1.067)	(.)	(0.534)
swift sanction 2*partner cur sh	0.033	0.014	0.000	-4.059***	0.000	1.405
	(0.183)	(0.246)	(.)	(0.419)	(.)	(1.202)
West bank post war*partner cur sh	0.160	-0.195	0.000	-3.560***	0.410***	-0.267
	(0.214)	(0.236)	(.)	(0.285)	(0.047)	(0.352)
partner currency share	0.386***	0.441***	-4.629***	4.556***	-0.577	0.071
	(0.130)	(0.137)	(0.927)	(0.125)	(0.499)	(0.484)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y
Observations	266151	16566	2904	6651	93817	146213
R^2	0.945	0.906	0.918	0.963	0.932	0.943

Standard errors in parentheses clustered at the product level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

7 Conclusion

Financial sanctions are an effective tool in reshaping Russia's international trade landscape. The exclusion of Russian banks from the SWIFT system and the withdrawal of Western financial institutions significantly curtailed Russian trade flows, especially its trade with Western countries. These measures primarily affected the extensive margin of trade, reducing the number of Russian firms engaged in cross-border transactions.

While trade sanctions imposed by the EU and the US effectively restrict trade between their firms and Russia but divert Russian trade toward non-Western countries, financial sanctions can also limit trade between Russia and these non-Western partners. In this way, financial sanctions complement trade sanctions.

We show that in Russian trade with Western countries, financial sanctions and trade sanctions tend to reinforce each other. This is likely because Western firms' efforts to obtain trade permits under trade sanctions decrease when their Russian trade partners are impacted by financial sanctions, reducing the returns from bearing such costs.

Russia has shifted away from US dollars and Euros, and increasingly used their partner's currencies to mitigate the impacts from Western sanctions. This development suggests that the effect of financial sanctions could weaken over time.

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Online Appendices

A Additional Regression Results

Table A.1: The Effects of SWIFT Sanctions and Western Banks' Withdrawal on Russian Import Firm Number

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.139***	-0.374***	-0.068***	0.040***	-0.047	-0.029**	-0.007	-0.037***
	(0.012)	(0.057)	(0.011)	(0.005)	(0.035)	(0.011)	(0.031)	(0.012)
swift sanction 2	-0.390***	-0.932***	-0.011	0.065***	0.005	0.111***	-0.140**	-0.085***
	(0.011)	(0.048)	(0.016)	(0.005)	(0.022)	(0.018)	(0.056)	(0.016)
West bank post war	-0.293***	-0.768***	-0.377***	-0.060***	-0.069***	0.015	0.076***	-0.125***
	(0.011)	(0.041)	(0.015)	(0.007)	(0.027)	(0.010)	(0.020)	(0.017)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1684632	69535	212692	762395	21452	106331	12839	189772
R^2	0.849	0.878	0.797	0.837	0.800	0.803	0.834	0.845

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.2: The Effects of SWIFT Sanctions and Western Banks' Withdrawal on Russian Export Firm Number

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Export							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.032	-0.218***	-0.126***	0.065	-0.035	0.037	-0.031*	-0.002
	(0.023)	(0.024)	(0.046)	(0.046)	(0.043)	(0.047)	(0.016)	(0.011)
swift sanction 2	-0.187***	-0.141***	-0.108*	-0.024	-0.278***	-0.035	-0.076***	-0.062***
	(0.034)	(0.047)	(0.061)	(0.039)	(0.078)	(0.061)	(0.013)	(0.015)
West bank post war	-0.056*	-0.144***	0.016	0.016	-0.013	0.040	-0.066***	-0.056***
	(0.033)	(0.045)	(0.064)	(0.024)	(0.041)	(0.068)	(0.014)	(0.015)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	78176	17417	9386	16611	2904	6667	93835	146292
R^2	0.888	0.800	0.849	0.911	0.758	0.853	0.859	0.954

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.3: The Joint Effects of Financial and Trade Sanctions on Russian Import by Detailed Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.247***	-0.316**	-0.256***	-0.089***	0.096	0.055	-0.299***	-0.215***
	(0.027)	(0.123)	(0.051)	(0.019)	(0.081)	(0.065)	(0.087)	(0.048)
swift sanction 2	-0.360***	-0.959***	0.176***	0.038**	-0.077	-0.085	-0.137*	-0.092**
	(0.022)	(0.110)	(0.042)	(0.019)	(0.088)	(0.055)	(0.083)	(0.039)
West bank post war	-0.495***	-1.330***	-1.075***	-0.466***	-0.142**	0.279***	0.133	-0.547***
	(0.023)	(0.104)	(0.060)	(0.029)	(0.071)	(0.055)	(0.106)	(0.062)
both E.U. and U.S. export control	-0.483***	-0.393***	-0.001	0.303***	0.161*	0.627***	-0.210*	-0.085
	(0.055)	(0.134)	(0.051)	(0.030)	(0.086)	(0.064)	(0.115)	(0.056)
only E.U. export control	-0.181***	0.047	0.080	0.136***	0.047	0.344***	0.284*	-0.055
	(0.062)	(0.180)	(0.094)	(0.033)	(0.103)	(0.061)	(0.145)	(0.061)
only U.S. export control	-0.282***	-0.572***	-0.042	0.086***	0.121	0.315***	0.174	-0.168*
	(0.087)	(0.187)	(0.087)	(0.028)	(0.166)	(0.083)	(0.174)	(0.099)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2060032	84641	266196	794425	34561	128889	19891	296616
R^2	0.822	0.806	0.834	0.769	0.826	0.816	0.792	0.864

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.4: The Joint Effects of Financial and Trade Sanctions on Russian Export by Detailed Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian export							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	0.060	-0.328***	-0.176*	0.109	-0.037	-0.123	-0.040	-0.029
	(0.058)	(0.072)	(0.102)	(0.096)	(0.118)	(0.119)	(0.042)	(0.031)
swift sanction 2	-0.078	-0.239**	0.016	-0.071	-0.429**	0.003	-0.064**	0.047*
	(0.054)	(0.100)	(0.116)	(0.083)	(0.179)	(0.127)	(0.031)	(0.028)
West bank post war	0.151***	-0.580***	-0.294**	0.282**	0.091	-0.036	-0.137***	-0.195***
	(0.048)	(0.169)	(0.139)	(0.110)	(0.150)	(0.106)	(0.041)	(0.036)
both E.U. and U.S. import ban	0.064	-2.955***	-0.067	0.484***	0.906***	0.743***	0.032	0.423***
	(0.115)	(0.039)	(0.113)	(0.124)	(0.232)	(0.147)	(0.143)	(0.067)
only E.U. import ban	-0.141**	-0.599***	-0.419***	-0.105	-0.012	0.071	-0.075**	-0.043
	(0.055)	(0.136)	(0.134)	(0.072)	(0.122)	(0.097)	(0.033)	(0.029)
only U.S. import ban	0.153	-0.262	-0.264*	0.137	-0.456	-0.319	-0.111	0.019
	(0.126)	(0.571)	(0.156)	(0.140)	(0.447)	(0.519)	(0.089)	(0.102)
U.S. tariff	-0.110	-0.742***	0.243	0.234	0.333	-0.257	-0.246***	-0.103
	(0.111)	(0.217)	(0.250)	(0.224)	(0.239)	(0.195)	(0.078)	(0.076)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	183474	27473	21371	23975	8820	15106	154226	260746
R^2	0.931	0.904	0.929	0.874	0.864	0.937	0.898	0.912

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.5: The Joint Effects of Financial and Trade Sanctions on Russian Import by Detailed Partners with Interaction Terms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.199***	-0.316**	-0.221***	-0.077***	0.073	-0.123*	-0.304***	-0.145***
	(0.027)	(0.136)	(0.057)	(0.021)	(0.087)	(0.065)	(0.093)	(0.045)
swift sanction 2	-0.312***	-0.998***	0.169***	0.007	-0.103	-0.134**	-0.127	0.019
	(0.022)	(0.132)	(0.048)	(0.021)	(0.094)	(0.064)	(0.087)	(0.038)
West bank post war	-0.393***	-1.153***	-0.964***	-0.442***	-0.118*	0.154**	0.145	-0.369***
	(0.023)	(0.116)	(0.062)	(0.031)	(0.071)	(0.060)	(0.110)	(0.053)
both E.U. and U.S. export control	-0.188***	-0.017	0.074	0.303***	0.093	0.431***	-0.173	0.223***
	(0.038)	(0.138)	(0.050)	(0.031)	(0.138)	(0.064)	(0.153)	(0.065)
only E.U. export control	-0.046	0.018	0.118	0.103***	0.015	0.226***	0.224	0.104*
	(0.047)	(0.156)	(0.089)	(0.036)	(0.151)	(0.058)	(0.190)	(0.053)
only U.S. export control	-0.178*	-0.422**	0.060	0.115***	0.175*	0.211***	0.372*	0.110
	(0.094)	(0.166)	(0.086)	(0.032)	(0.106)	(0.078)	(0.213)	(0.092)
swift sanction 1*both E.U. and U.S. export control	-0.284***	-0.047	-0.232***	-0.066*	0.028	0.792***	-0.065	-0.267**
	(0.064)	(0.366)	(0.090)	(0.040)	(0.163)	(0.121)	(0.229)	(0.132)
swift sanction 1*only E.U. export control	-0.162*	-0.305	0.005	0.050	0.075	0.313**	0.474**	-0.273**
	(0.087)	(0.451)	(0.154)	(0.058)	(0.218)	(0.135)	(0.212)	(0.127)
swift sanction 1*only U.S. export control	-0.095	0.163	-0.024	-0.066	0.245	0.047	-0.214	-0.204**
	(0.076)	(0.253)	(0.119)	(0.050)	(0.393)	(0.221)	(0.236)	(0.080)
swift sanction 2*both E.U. and U.S. export control	-0.306***	-0.258	0.083	0.113**	0.193	0.050	-0.091	-0.580***
	(0.052)	(0.204)	(0.081)	(0.044)	(0.213)	(0.113)	(0.202)	(0.119)
swift sanction 2*only E.U. export control	-0.211***	0.684**	0.030	0.186***	0.040	0.433***	0.187	-0.159
	(0.072)	(0.271)	(0.104)	(0.053)	(0.312)	(0.142)	(0.297)	(0.120)
swift sanction 2*only U.S. export control	-0.047	-0.139	-0.174	-0.033	0.137	0.093	-0.388*	-0.265**
	(0.071)	(0.262)	(0.108)	(0.048)	(0.240)	(0.145)	(0.232)	(0.116)
West bank post war*both E.U. and U.S. export control	-0.657***	-1.058***	-0.394***	-0.066	0.053	0.465***	0.153	-0.750***
	(0.074)	(0.261)	(0.144)	(0.063)	(0.219)	(0.103)	(0.237)	(0.182)
West bank post war*only E.U. export control	-0.254***	-0.243	-0.235	-0.017	0.045	0.167	-0.750**	-0.352**
	(0.077)	(0.332)	(0.162)	(0.091)	(0.247)	(0.131)	(0.336)	(0.146)
West bank post war*only U.S. export control	-0.261***	-0.589**	-0.473***	-0.144**	-0.341	0.420***	-0.527	-0.830***
	(0.058)	(0.250)	(0.144)	(0.066)	(0.260)	(0.128)	(0.513)	(0.125)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	2060032	84641	266196	794425	34561	128889	19891	296616
R^2	0.822	0.806	0.834	0.769	0.826	0.816	0.792	0.865

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.6: The Joint Effects of Financial and Trade Sanctions on Russian Export by Detailed Partners with Interaction Terms

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian export							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	0.050	-0.285***	-0.190	0.000	0.185	-0.108	-0.126**	-0.059
	(0.065)	(0.069)	(0.146)	(0.159)	(0.166)	(0.132)	(0.063)	(0.038)
swift sanction 2	-0.003	-0.281**	-0.235	-0.083	0.094	-0.070	-0.050	-0.004
	(0.070)	(0.116)	(0.152)	(0.127)	(0.232)	(0.141)	(0.043)	(0.038)
West bank post war	0.131**	-0.315*	-0.313*	0.323*	0.111	-0.011	-0.159***	-0.200***
	(0.051)	(0.171)	(0.178)	(0.174)	(0.205)	(0.107)	(0.050)	(0.041)
both E.U. and U.S. import ban	0.070	-3.555***	-0.149	0.499***	1.058***	0.859***	0.010	0.389***
	(0.136)	(0.043)	(0.124)	(0.170)	(0.319)	(0.176)	(0.136)	(0.099)
only E.U. import ban	-0.149*	-0.388**	-0.513***	-0.133*	0.252*	0.000	-0.095**	-0.149***
	(0.077)	(0.171)	(0.170)	(0.079)	(0.151)	(0.196)	(0.043)	(0.041)
only U.S. import ban	0.198	-1.064**	-0.319*	0.121	0.511	-0.218	-0.077	0.175
	(0.150)	(0.488)	(0.163)	(0.203)	(0.315)	(0.524)	(0.130)	(0.200)
U.S. tariff	-0.096	-0.724***	0.210	0.254	0.343	-0.276	-0.246***	-0.095
	(0.113)	(0.217)	(0.253)	(0.226)	(0.256)	(0.206)	(0.079)	(0.076)
swift sanction 1*both E.U. and U.S. import ban	-0.640*	1.856***	-0.228	0.089	-0.516	-0.704**	0.370	-0.080
	(0.356)	(0.113)	(0.182)	(0.220)	(0.315)	(0.356)	(0.239)	(0.113)
swift sanction 1*only E.U. import ban	-0.058	-0.149	0.149	0.174	-0.412*	0.051	0.141*	0.149**
	(0.116)	(0.417)	(0.232)	(0.158)	(0.226)	(0.227)	(0.074)	(0.067)
swift sanction 1*only U.S. import ban	-0.115	1.406***	0.118	0.154	-1.825***	-0.416	0.061	-0.011
	(0.232)	(0.493)	(0.176)	(0.280)	(0.339)	(0.522)	(0.147)	(0.347)
swift sanction 1*U.S. tariff	0.012	-0.015	-0.017	-0.000	-0.007	0.010	0.012	-0.000
	(0.010)	(0.019)	(0.025)	(0.027)	(0.034)	(0.051)	(0.011)	(0.004)
swift sanction 2*both E.U. and U.S. import ban	0.252*	0.000	0.195	-0.410	-0.540	-0.398*	0.097	0.035
	(0.145)	(.)	(0.397)	(0.346)	(0.458)	(0.228)	(0.150)	(0.199)
swift sanction 2*only E.U. import ban	-0.120	-0.511*	0.419	0.080	-0.405	0.187	0.021	0.276***
	(0.121)	(0.292)	(0.272)	(0.175)	(0.313)	(0.256)	(0.055)	(0.051)
swift sanction 2*only U.S. import ban	-0.145	0.001	0.052	0.028	0.000	0.000	-0.135	-0.402*
	(0.351)	(0.500)	(0.319)	(0.277)	(.)	(.)	(0.238)	(0.238)
swift sanction 2*U.S. tariff	-0.022**	0.045**	0.050*	-0.001	-0.161	0.015	-0.007	-0.008
	(0.010)	(0.021)	(0.030)	(0.026)	(0.111)	(0.042)	(0.007)	(0.006)
West bank post war*both E.U. and U.S. import ban	0.191	0.000	0.301	0.201	0.724	-0.006	-0.321***	0.391
	(0.279)	(.)	(0.263)	(0.274)	(0.532)	(0.244)	(0.066)	(0.276)
West bank post war*only E.U. import ban	0.142	-0.689**	-0.008	-0.076	-0.284	0.013	0.000	0.010
	(0.114)	(0.350)	(0.219)	(0.189)	(0.241)	(0.236)	(0.066)	(0.068)
West bank post war*only U.S. import ban	-0.050	1.630***	0.810***	-0.098	0.395	-1.140**	-0.056	-0.265
	(0.287)	(0.527)	(0.274)	(0.216)	(0.358)	(0.502)	(0.160)	(0.216)
West bank post war*U.S. tariff	-0.000	-0.032	-0.005***	-0.011	0.021	0.000	0.006	0.001**
	(0.001)	(0.034)	(0.001)	(0.023)	(0.056)	(0.000)	(0.005)	(0.000)
Bank-Product-Country-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	183474	27473	21371	23975	8820	15106	154226	260746
R^2	0.931	0.904	0.930	0.874	0.865	0.937	0.898	0.912

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.7: Firm-level Russian Import by Detailed Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian import							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.005	0.025	-0.021	-0.067***	0.086	0.265***	-0.122	-0.195***
	(0.014)	(0.091)	(0.031)	(0.011)	(0.079)	(0.047)	(0.082)	(0.041)
swift sanction 2	-0.045***	0.180*	0.146***	-0.029***	0.109	0.012	-0.003	0.012
	(0.014)	(0.101)	(0.031)	(0.009)	(0.093)	(0.052)	(0.078)	(0.033)
West bank post war	-0.167***	-0.304***	-0.588***	-0.192***	0.067	0.377***	0.283**	-0.281***
	(0.013)	(0.058)	(0.040)	(0.019)	(0.066)	(0.050)	(0.141)	(0.049)
Product-Firm-Country f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Bank-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	3705365	175327	427384	1755419	41521	188257	22298	386828
R^2	0.836	0.785	0.852	0.792	0.870	0.825	0.774	0.873

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.8: Firm-level Russian Export by Detailed Partners

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian export							
	E.U.	U.S.	Other Western	China	India	Turkey	CIS	Other Non-Western
swift sanction 1	-0.021	-0.137***	0.086	-0.072	-0.134	-0.285*	0.009	-0.053
	(0.065)	(0.052)	(0.094)	(0.067)	(0.142)	(0.150)	(0.045)	(0.038)
swift sanction 2	-0.036	0.068	-0.001	0.014	-0.442*	-0.137	-0.010	0.036
	(0.057)	(0.066)	(0.102)	(0.063)	(0.234)	(0.162)	(0.043)	(0.037)
West bank post war	-0.111	-0.448**	-0.159	0.227*	0.091	0.014	-0.061	-0.040
	(0.068)	(0.217)	(0.210)	(0.134)	(0.141)	(0.130)	(0.040)	(0.047)
Product-Firm-Country f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Bank-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	166428	30217	17619	48483	6461	13096	178691	430853
R^2	0.937	0.910	0.901	0.839	0.913	0.953	0.909	0.892

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.9: Firm-level Effects of Joint Financial and Trade Sanctions on Russian Import

	(1)	(2)	(3)	(4)
	Russian Import			
	West		Non-West	
swift sanction 1	-0.006	-0.015	-0.053	-0.066**
	(0.031)	(0.033)	(0.036)	(0.031)
swift sanction 2	0.012	-0.009	-0.027	-0.031
	(0.034)	(0.033)	(0.025)	(0.020)
West bank post war	-0.189***	-0.158***	-0.176	-0.183*
	(0.054)	(0.044)	(0.120)	(0.103)
both E.U. and U.S. export control	-0.072*	-0.049	0.177***	0.156***
	(0.037)	(0.037)	(0.020)	(0.024)
only E.U. export control	-0.025	0.014	0.076***	0.065***
	(0.022)	(0.018)	(0.013)	(0.018)
only U.S. export control	-0.041**	-0.019	0.064***	0.066***
	(0.019)	(0.019)	(0.011)	(0.015)
swift sanction 1*both E.U. and U.S. export control		0.042		0.065*
		(0.053)		(0.038)
swift sanction 1*only E.U. export control		-0.045		0.014
		(0.042)		(0.022)
swift sanction 1*only U.S. export control		0.075**		0.020
		(0.032)		(0.016)
swift sanction 2*both E.U. and U.S. export control		0.105***		0.018
		(0.037)		(0.051)
swift sanction 2*only E.U. export control		0.056***		0.024
		(0.019)		(0.024)
swift sanction 2*only U.S. export control		0.000		0.001
		(0.018)		(0.014)
West bank post war*both E.U. and U.S. export control		-0.159		0.072
		(0.116)		(0.104)
West bank post war*only E.U. export control		-0.132***		0.033
		(0.037)		(0.047)
West bank post war*only U.S. export control		-0.088		-0.038
		(0.056)		(0.052)
Product-Firm-Country f.e.	Y	Y	Y	Y
Bank-Season f.e.	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y
Observations	4814244	4814244	2612722	2612722
R^2	0.813	0.813	0.792	0.792

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.10: Firm-level Effects of Joint Financial and Trade Sanctions on Russian Export

	(1)	(2)	(3)	(4)
	Russian Export			
	West		Non-West	
swift sanction 1	-0.015	-0.027	-0.024	-0.036
	(0.035)	(0.040)	(0.017)	(0.022)
swift sanction 2	-0.035	-0.028	0.020	0.016
	(0.031)	(0.040)	(0.019)	(0.022)
West bank post war	0.067	0.076*	-0.042**	-0.067**
	(0.045)	(0.042)	(0.021)	(0.026)
both E.U. and U.S. import ban	0.024	0.021	0.334***	0.398***
	(0.058)	(0.081)	(0.064)	(0.086)
only E.U. import ban	-0.152***	-0.174***	-0.025	-0.068***
	(0.042)	(0.046)	(0.016)	(0.026)
only U.S. import ban	-0.022	0.006	-0.087*	-0.027
	(0.070)	(0.077)	(0.049)	(0.068)
U.S. tariff	-0.019	-0.016	-0.054	-0.053
	(0.074)	(0.075)	(0.043)	(0.043)
swift sanction 1*both E.U. and U.S. import ban		-0.273		-0.046
		(0.177)		(0.121)
swift sanction 1*only E.U. import ban		0.064		0.052
		(0.078)		(0.037)
swift sanction 1*only U.S. import ban		0.047		-0.037
		(0.101)		(0.113)
swift sanction 1*U.S. tariff		0.003		-0.000
		(0.006)		(0.003)
swift sanction 2*both E.U. and U.S. import ban		0.137		-0.226***
		(0.143)		(0.075)
swift sanction 2*only E.U. import ban		0.054		0.062*
		(0.066)		(0.037)
swift sanction 2*only U.S. import ban		-0.067		-0.197**
		(0.159)		(0.081)
swift sanction 2*U.S. tariff		-0.006		-0.002
		(0.006)		(0.003)
West bank post war*both E.U. and U.S. import ban		0.049		0.041
		(0.092)		(0.138)
West bank post war*only E.U. import ban		-0.001		0.080**
		(0.104)		(0.039)
West bank post war*only U.S. import ban		-0.146		-0.090
		(0.195)		(0.063)
West bank post war*U.S. tariff		-0.001		0.001*
		(0.001)		(0.000)
Product-Firm-Country f.e.	Y	Y	Y	Y
Bank-Season f.e.	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y
Observations	386842	386842	929756	929756
R^2	0.904	0.904	0.885	0.885

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.11: Effects of Western Trade Sanctions on Russian Import: Considering Zeros with Inverse Hyperbolic Sine Transformation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import							
	E.U.	U.S.	Other West	China	India	Turkey	CIS	Other Non-West
both E.U. and U.S. export control	-1.261***	-0.692***	-0.901***	1.133***	0.438***	1.159***	0.549***	0.271***
	(0.062)	(0.132)	(0.075)	(0.099)	(0.124)	(0.116)	(0.074)	(0.041)
only E.U. export control	-1.042***	0.018	-0.167**	1.051***	0.862***	0.886***	0.394***	0.140***
	(0.063)	(0.128)	(0.071)	(0.122)	(0.124)	(0.138)	(0.081)	(0.049)
only U.S. export control	-0.317***	-0.839***	-0.322***	0.582***	0.278**	1.140***	0.279***	0.176***
	(0.067)	(0.152)	(0.075)	(0.133)	(0.140)	(0.135)	(0.080)	(0.043)
Country-Product-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	3119856	158256	614400	220704	149424	199392	384288	2095248
R^2	0.686	0.652	0.670	0.774	0.664	0.708	0.619	0.628

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.12: Effects of Western Trade Sanctions on Russian Export: Considering Zeros with Inverse Hyperbolic Sine Transformation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Export							
	E.U.	U.S.	Other West	China	India	Turkey	CIS	Other Non-West
both E.U. and U.S. import ban	-0.252	0.000	-0.767***	-0.443	0.789	0.141	0.216**	0.210**
	(0.155)	(.)	(0.281)	(0.367)	(0.539)	(0.212)	(0.098)	(0.097)
only E.U. import ban	-0.526***	-0.621***	-0.235**	0.123	-0.067	0.296***	-0.126***	-0.038
	(0.080)	(0.138)	(0.102)	(0.089)	(0.107)	(0.097)	(0.031)	(0.028)
only U.S. import ban	0.048	-0.845	-0.373**	0.029	1.544**	0.450**	0.095	0.304***
	(0.174)	(1.353)	(0.172)	(0.153)	(0.670)	(0.216)	(0.103)	(0.065)
U.S. tariff	-0.677***	-1.540***	-0.154	-0.563**	0.002	-0.164	-0.159**	-0.195***
	(0.124)	(0.282)	(0.209)	(0.231)	(0.321)	(0.237)	(0.067)	(0.065)
Observations	241896	24896	29753	23544	15086	22533	185093	392457
R^2	0.862	0.816	0.900	0.842	0.777	0.844	0.816	0.852

Standard errors in parentheses clustered at the product level
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

B Can Barter Trade Counter Financial Sanctions?

We check whether barter trade can possibly help mitigate the impacts of financial sanctions as well. To this end, we hypothesize that Russian firms that both import from and export to the same country may enable them to engage in barter trade, thus alleviating the negative impacts of financial sanctions.

Table A.13 analyzes the effects of SWIFT sanctions and Western banks' withdrawals on Russian imports, incorporating a yearly export dummy to capture barter-like trade dynamics. The results are segmented by trade regions, including non-Western partners: China, India, Turkey, CIS, and Other Non-West countries.

The first-round SWIFT sanctions combined with the export dummy result in significant reductions in imports, including 15.13%(=1-exp(-0.164)) for non-Western partners, 15.63%(=1-exp(-0.017)) for China, 48.93%(=1-exp(-0.672)) for India, 15.97%(=1-exp(-0.174)) for Turkey, 18.05%(=1-exp(-0.199)) for CIS and 7.13%(=1-exp(-0.074)) for other non-Western countries, suggesting limited flexibility for barter-like transactions under financial sanctions. The interaction of Western banks' withdrawal and the export dummy also has strong negative effects, particularly for Other Non-West imports with a 55.91%(=1-exp(-0.819)) decline.

Table A.14 examines the effects of SWIFT sanctions and Western bank withdrawals on Russian exports, incorporating a yearly import dummy. Results are also segmented by non-Western trade partners, including China, India, Turkey, CIS, and Other Non-West countries. The yearly import dummy captures the role of trade interdependencies in mitigating or amplifying the effects of sanctions. The interaction of the first-round SWIFT sanctions and the import dummy is significant and positive for exports to India (108.4%) and Turkey (70.3%), suggesting that import-linked trade helps sustain exports to these regions. However, for Other Non-West countries, the same interaction term is negative, leading to a 36.4% reduction in exports, indicating that trade dependencies may increase vulnerability in some cases.

For the second-round sanctions, the import dummy interaction term shows a positive effect for non-Western exports overall (10.6%) and for CIS countries (24.6%), indicating that barter-like trade arrangements mitigate the impact of financial restrictions. However, the interaction is not statistically significant for other regions.

Table A.13: Effects of SWIFT Sanctions and Western Banks on Russian Import with Export Dummy

	(1)	(2)	(3)	(4)	(5)	(6)
	Russian Import					
	Non-West	China	India	Turkey	CIS	Other Non-West
swift sanction 1	-0.032	-0.045***	0.135	0.283***	-0.079	-0.188***
	(0.027)	(0.011)	(0.082)	(0.048)	(0.081)	(0.041)
swift sanction 2	-0.017	-0.034***	0.093	0.000	-0.017	0.026
	(0.032)	(0.009)	(0.097)	(0.055)	(0.076)	(0.033)
West bank post war	-0.096	-0.173***	0.069	0.443***	0.240*	-0.174***
	(0.099)	(0.016)	(0.067)	(0.050)	(0.144)	(0.047)
swift sanction 1*yearly export dummy	-0.164*	-0.170***	-0.672**	-0.174**	-0.199	-0.074
	(0.085)	(0.028)	(0.275)	(0.086)	(0.232)	(0.125)
swift sanction 2*yearly export dummy	0.018	0.026	0.067	0.122	0.096	-0.090
	(0.032)	(0.021)	(0.138)	(0.087)	(0.124)	(0.154)
West bank post war*yearly export dummy	-0.158	-0.123**	-0.005	-0.218***	0.270**	-0.819***
	(0.185)	(0.053)	(0.149)	(0.083)	(0.117)	(0.122)
yearly export dummy	-0.027	-0.043***	-0.234***	0.124***	0.041	-0.006
	(0.031)	(0.009)	(0.068)	(0.031)	(0.070)	(0.017)
Product-Firm-Country f.e.	Y	Y	Y	Y	Y	Y
Bank-Season f.e.	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y
Observations	2395534	1755419	41521	188257	22298	386828
R^2	0.810	0.792	0.871	0.825	0.774	0.873

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.14: Effects of SWIFT Sanctions and Western Banks on Russian Export with Import Dummy

	(1)	(2)	(3)	(4)	(5)	(6)
	Russian Export					
	Non-West	China	India	Turkey	CIS	Other Non-West
swift sanction 1	-0.023	-0.127	-0.197	-0.385***	0.018	-0.013
	(0.023)	(0.079)	(0.142)	(0.148)	(0.046)	(0.039)
swift sanction 2	-0.002	-0.006	-0.529**	-0.207	-0.028	0.039
	(0.022)	(0.059)	(0.223)	(0.160)	(0.043)	(0.037)
West bank post war	-0.028	0.156	-0.022	-0.072	-0.043	-0.038
	(0.050)	(0.135)	(0.122)	(0.133)	(0.040)	(0.048)
swift sanction 1*yearly import dummy	-0.127	0.174	1.084***	0.703**	-0.189	-0.364***
	(0.079)	(0.113)	(0.342)	(0.311)	(0.116)	(0.075)
swift sanction 2*yearly import dummy	0.106***	0.087	0.542	0.222*	0.246***	-0.193
	(0.038)	(0.081)	(0.481)	(0.130)	(0.069)	(0.245)
West bank post war*yearly import dummy	-0.018	0.239	0.239	0.202	-0.149*	-0.022
	(0.076)	(0.193)	(0.205)	(0.206)	(0.079)	(0.097)
yearly import dummy	0.057***	-0.022	0.165	-0.074	0.029	0.072***
	(0.021)	(0.044)	(0.119)	(0.110)	(0.033)	(0.016)
Product-Firm-Country f.e.	Y	Y	Y	Y	Y	Y
Bank-Season f.e.	Y	Y	Y	Y	Y	Y
Product-Country-Time f.e.	Y	Y	Y	Y	Y	Y
Observations	678580	48483	6461	13096	178691	430853
R^2	0.911	0.839	0.914	0.953	0.909	0.892

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

C Product-Country-Month Level Investigation on Trade Sanctions

We then move to the product-country-month level investigation of the effects of Western trade sanctions. Note that E.U. and U.S. trade sanctions are mostly imposed at the product level against Russia. For a given products, it may be imported or exported by Russian firms transacted using different banks. Product-level investigations can take into account potential bank entry and exit at the country-product level, which is missing in previous analysis.

Table A.15 evaluates the impact of E.U. and U.S. export controls on Russian imports from various trading partners. Joint E.U. and U.S. export controls significantly decrease Russian imports from the E.U. (-0.851), the U.S. (-0.651), and "Other West" (-0.728), all statistically significant at the 1% level. In contrast, these controls are associated with substantial increases in imports from non-Western partners such as China (0.647), India (0.573), and Turkey (0.852), suggesting a shift in trade patterns towards these regions. E.U.-only export controls also reduce imports from the E.U. (-0.478) but have a positive and significant impact on imports from countries like China (0.577) and Turkey (0.751). Similarly, U.S.-only export controls lead to a decline in imports from the U.S. (-0.352) and "Other West" (-0.192) while increasing imports from China (0.211), India (0.423), and Turkey (0.653). These results highlight the adaptive response of Russian imports to sanctions, with a notable diversification towards non-Western markets.

Table A.16 examines the differential impacts of E.U. and U.S. import bans, as well as U.S. tariffs, on Russia's exports to various trading partners. Joint E.U. and U.S. import bans have significant negative effects on Russian exports to Western countries, such as the E.U. (-0.333) and "Other West" (-0.750), with the latter being statistically significant at the 1% level. However, exports to non-Western partners, such as India (1.590) and Turkey (0.590), show significant increases, suggesting trade diversion to these regions. E.U.-only import bans significantly reduce exports to the E.U. (-0.524) and "Other West" (-0.236), while increasing trade with Turkey (0.300). U.S.-only import bans exhibit inconsistent effects, with a small positive impact on exports to the E.U. (0.221) but no significant effect on most other regions. U.S. tariffs uniformly reduce Russian exports to key partners, including the E.U. (-0.669) and China (-0.566). This is possibly due to the reduction in these countries' re-export of Russian goods or exports with significant Russian content to the U.S.

Finally, we evaluate the effects of Western oil price cap. Noting that only certain oil products were sanctioned, we treat oil products that were not sanctioned as the control group.[1] We examine

[1] Oil products are defined as 4-digit HS codes 2707 and 2709-2715.

Table A.15: Effects of Western Trade Sanctions on Russian Import

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Import							
	E.U.	U.S.	Other West	China	India	Turkey	CIS	Other Non-West
both E.U. and U.S. export control	-0.851***	-0.651***	-0.728***	0.647***	0.573***	0.852***	0.118	0.281***
	(0.050)	(0.133)	(0.077)	(0.038)	(0.096)	(0.067)	(0.126)	(0.043)
only E.U. export control	-0.478***	0.060	-0.069	0.577***	0.190*	0.751***	0.270*	0.078
	(0.047)	(0.135)	(0.087)	(0.058)	(0.114)	(0.084)	(0.148)	(0.058)
only U.S. export control	-0.229***	-0.352***	-0.192**	0.211***	0.423***	0.653***	0.288*	0.111**
	(0.043)	(0.119)	(0.077)	(0.039)	(0.102)	(0.065)	(0.158)	(0.050)
Country-Product-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	1028159	46676	157140	145733	41171	82320	32172	315441
R^2	0.780	0.774	0.778	0.837	0.734	0.772	0.813	0.795

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.16: Effects of Western Trade Sanctions on Russian Export

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Russian Export							
	E.U.	U.S.	Other West	China	India	Turkey	CIS	Other Non-West
both E.U. and U.S. import ban	-0.333	-2.240	-0.750***	-0.043	1.590**	0.590**	0.301**	0.402***
	(0.249)	(2.644)	(0.205)	(0.255)	(0.649)	(0.230)	(0.126)	(0.069)
only E.U. import ban	-0.524***	-0.612***	-0.236**	0.126	-0.054	0.300***	-0.124***	-0.036
	(0.079)	(0.138)	(0.102)	(0.089)	(0.106)	(0.097)	(0.031)	(0.028)
only U.S. import ban	0.221*	0.185	-0.252	-0.075	0.574	0.078	0.000	0.185**
	(0.133)	(0.155)	(0.175)	(0.172)	(0.470)	(0.221)	(0.083)	(0.081)
U.S. tariff	-0.669***	-1.514***	-0.145	-0.566**	0.021	-0.157	-0.164**	-0.197***
	(0.124)	(0.284)	(0.208)	(0.231)	(0.323)	(0.237)	(0.067)	(0.065)
Country-Product-Season f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y	Y	Y
Observations	241896	24896	29753	23544	15086	22533	185093	392457
R^2	0.862	0.816	0.900	0.842	0.777	0.844	0.816	0.852

Standard errors in parentheses clustered at the product level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.17: The Effects of Price Cap on Certain Oil Products

	(1)	(2)	(3)	(4)	(5)	(6)
	Russian Export of Oil Products					
	Non-West	China	India	Turkey	CIS	Other Non-West
price cap (first-round)	-0.608	-0.947**	1.972	0.105	-2.128***	-0.314*
	(0.399)	(0.367)	(2.244)	(0.292)	(0.433)	(0.156)
price cap (second-round)	0.344	0.140	-2.654	-0.232	2.336***	0.000
	(0.512)	(0.392)	(3.590)	(0.395)	(0.471)	(.)
Country-Product-Season f.e.	Y	Y	Y	Y	Y	Y
Country-Time f.e.	Y	Y	Y	Y	Y	Y
Observations	5700	407	174	280	2246	2593
R^2	0.932	0.898	0.915	0.946	0.923	0.930

Standard errors in parentheses clustered at the product level.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table A.18. Russian Import Value Change (annualized, billion USD) by Partners Due to E.U. and U.S. Export Controls

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	E.U.	U.S.	Other West	China	India	Turkey	CIS	Other Non-West
Both E.U. and U.S. Export Control	-23.82	-0.91	-3.41	18.15	0.53	1.73	0.20	3.18
Only E.U. Export Control	-3.91	0.04	-0.07	1.72	0.01	1.07	0.11	0.25
Only U.S. Export Control	-5.26	-0.34	-0.93	2.63	0.11	0.51	0.22	0.41

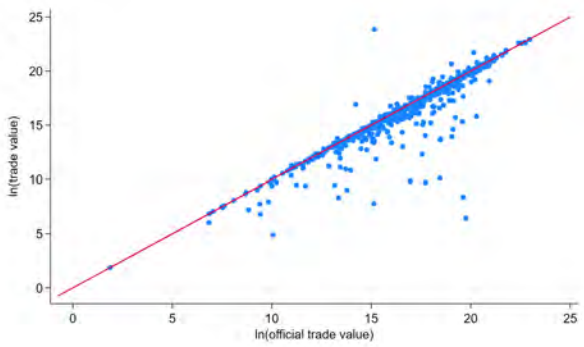
the impact of Western-imposed oil price caps on Russian exports of oil products to various non-Western trading partners. During the first round of price caps, Russian exports experienced a substantial decline in the CIS region (-2.128), significant at the 1% level, and a modest decline in "Other Non-West" markets (-0.314), significant at the 10% level. Exports to China also fell (-0.947), significant at the 5% level, while India and Turkey showed no significant effects, with India's coefficient (1.972) indicating a possible increase but lacking statistical significance. In the second round of price caps, Russian exports rebounded in the CIS region (2.336, significant at the 1% level) but showed no significant changes in other regions, with India's coefficient (-2.654) indicating a potential decline but with high uncertainty.

Table A.19. Russian Export Value Change (annualized, billion USD) by Partners Due to E.U. and U.S. Import Bans

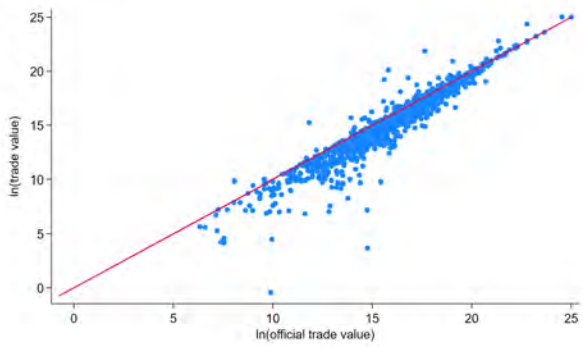
	(1) E.U.	(2) U.S.	(3) Other West	(4) China	(5) India	(6) Turkey	(7) CIS	(8) Other Non-West
Both E.U. and U.S. Import Ban	-15.54	-3.33	-6.78	-1.65	5.94	2.45	0.26	3.73
Only E.U. Import Ban	-10.42	-1.00	-0.77	1.08	-0.12	1.66	-1.57	-0.89
Only U.S. Import Ban	20.30	1.02	-2.03	-0.50	1.52	0.79	0.00	6.43

D Additional Tables and Figures

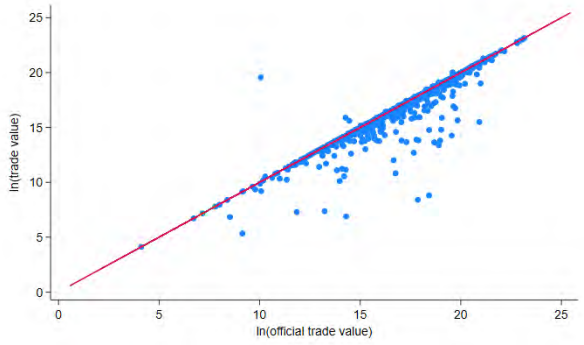
Figure A.1: Comparison between UN Comtrade and Our Customs Data at the HS-4 Product Level



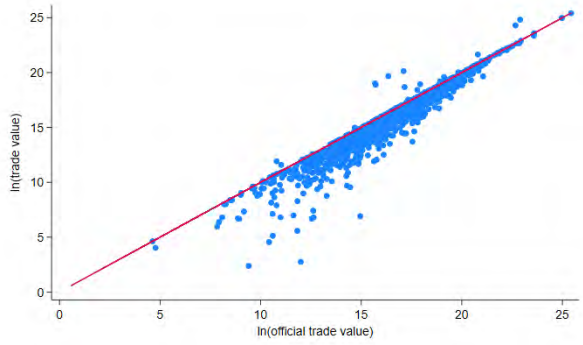
(a) 2020 Import



(b) 2020 Export



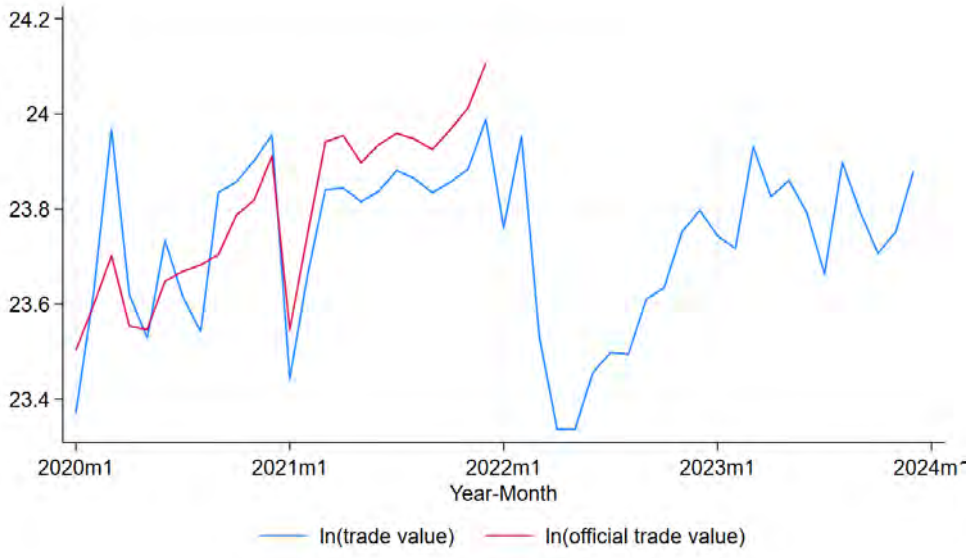
(c) 2021 Import



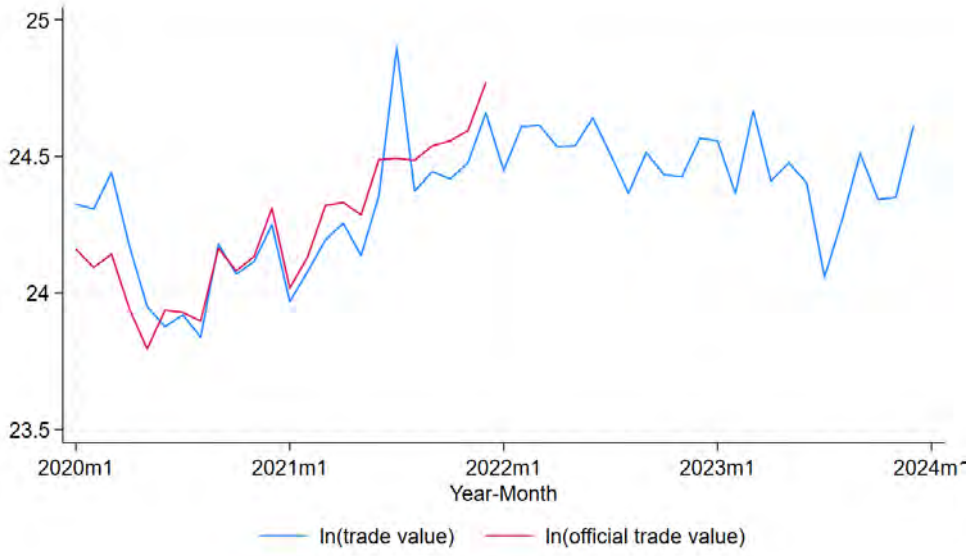
(d) 2021 Export

Notes: This graph shows the comparison of trade values between UN Comtrade Russia reported official data and our customs data. The red line is the 45 degree line.

Figure A.2: Time Series' Comparison between UN Comtrade and Our Customs Data



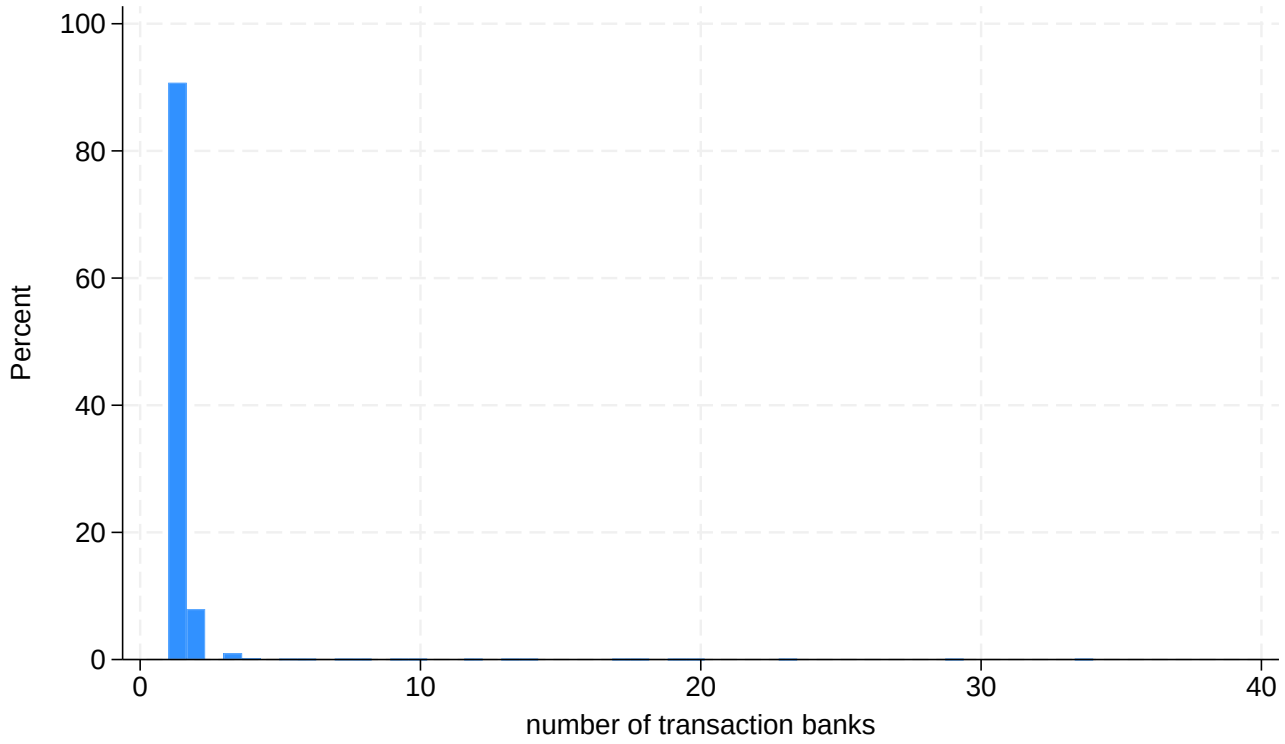
(a) Monthly Import



(b) Monthly Export

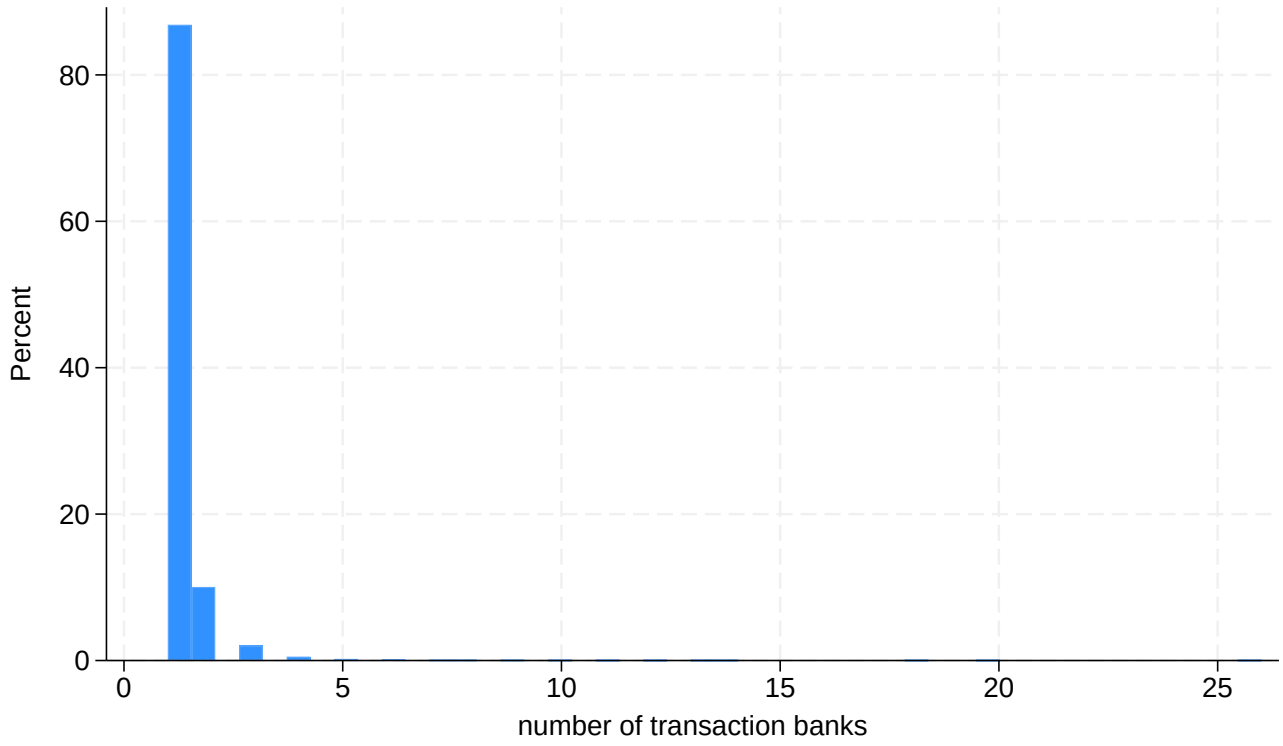
Notes: This graph shows the monthly dynamics of trade values recorded in UN Comtrade Russia reported data and our customs data.

Figure A.3: Distribution of Number of Import Transaction Banks at the Firm-Country Level



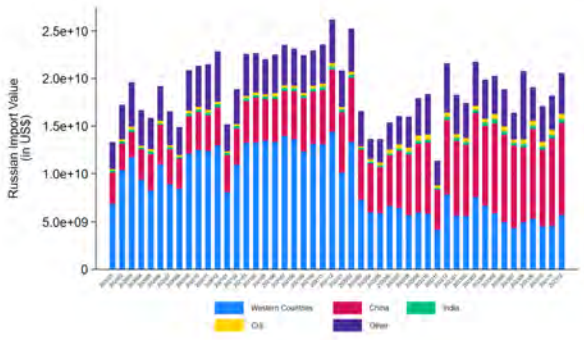
Notes: This graph shows the distribution of number of import transaction banks at the firm-country level in 2016.

Figure A.4: Distribution of Number of Export Transaction Banks at the Firm-Country Level

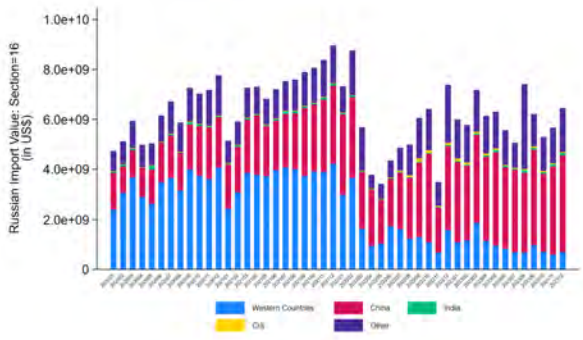


Notes: This graph shows the distribution of number of export transaction banks at the firm-country level in 2016.

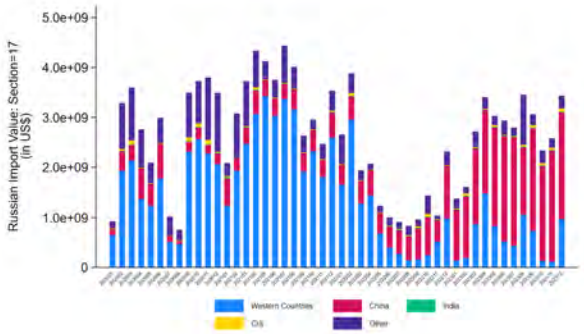
Figure A.5: Import Value Dynamics by Section



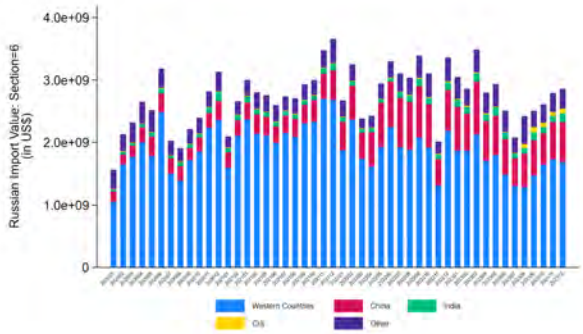
(a) All



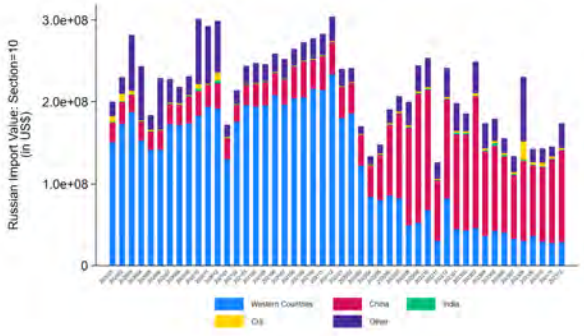
(b) Machinery, Appliances, Electrical Equipment



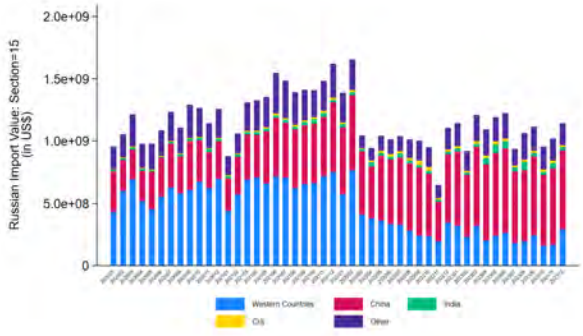
(c) Vehicles, Aircraft, Vessels



(d) Products of the Chemical or Allied Industries



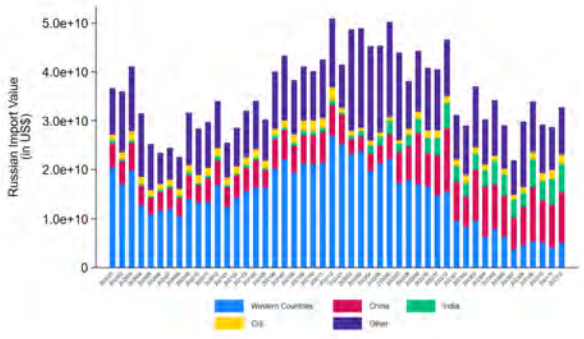
(e) Pulp of Wood, Paper



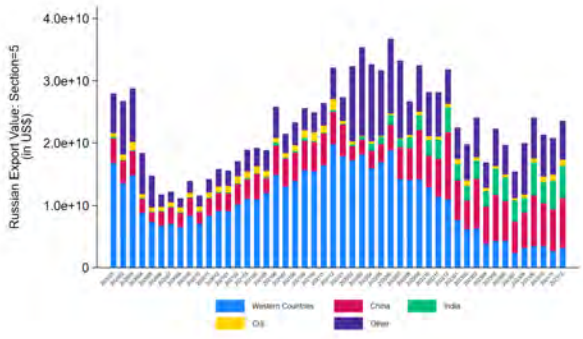
(f) Base Metals and Articles of Base Metals

This graph shows the monthly dynamics of Russian import value from different trading partners.

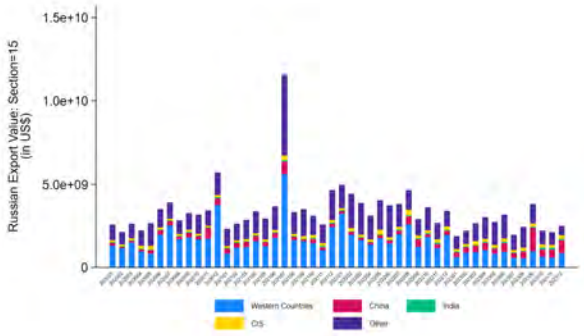
Figure A.6: Export Value Dynamics by Section



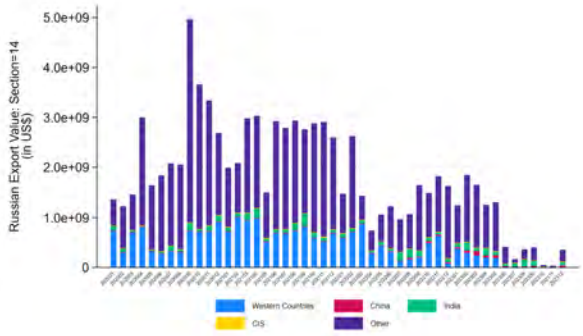
(a) All



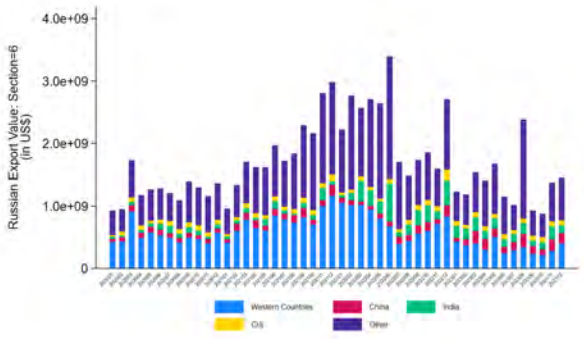
(b) Mineral Products



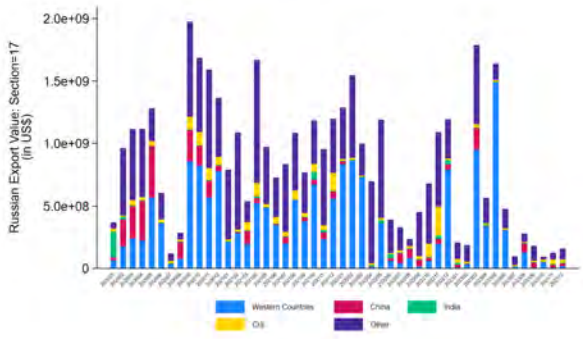
(c) Base Metals and Articles of Base Metals



(d) Pearls, precious stones, precious metals



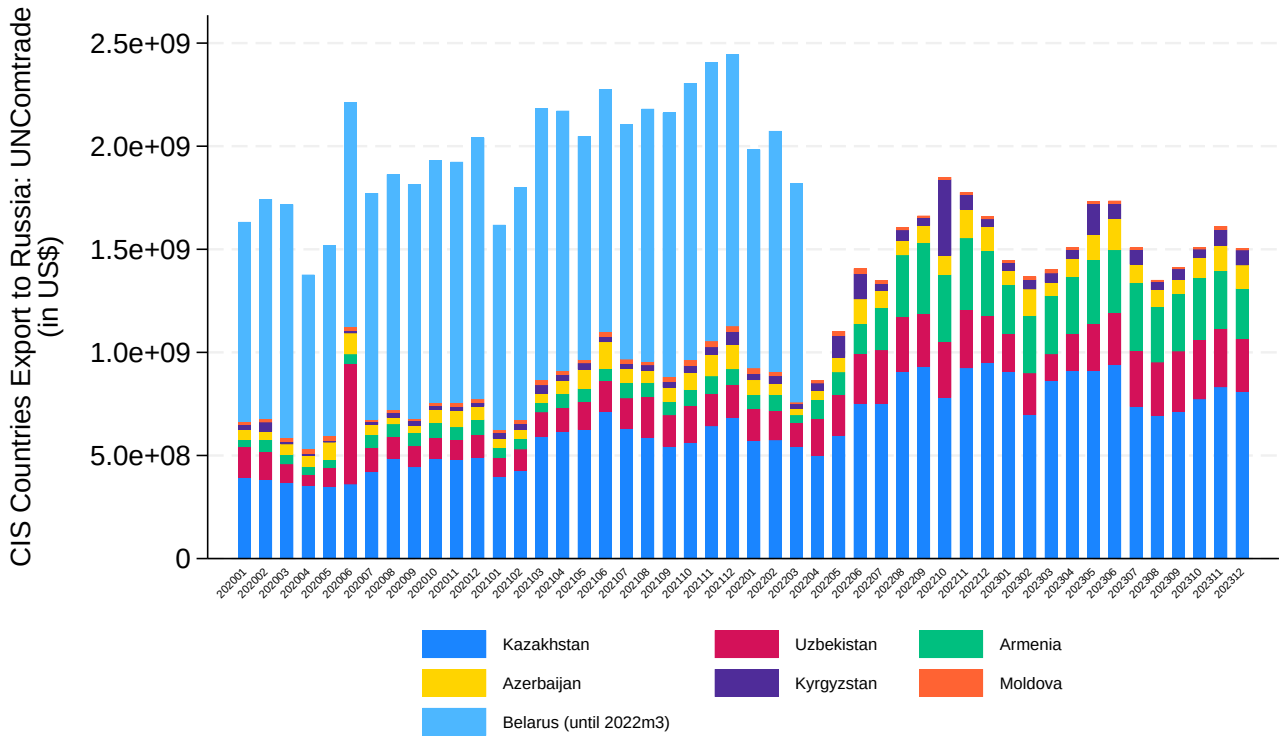
(e) Products of the chemical or allied industries



(f) Vehicles, Aircrafts, Vessels

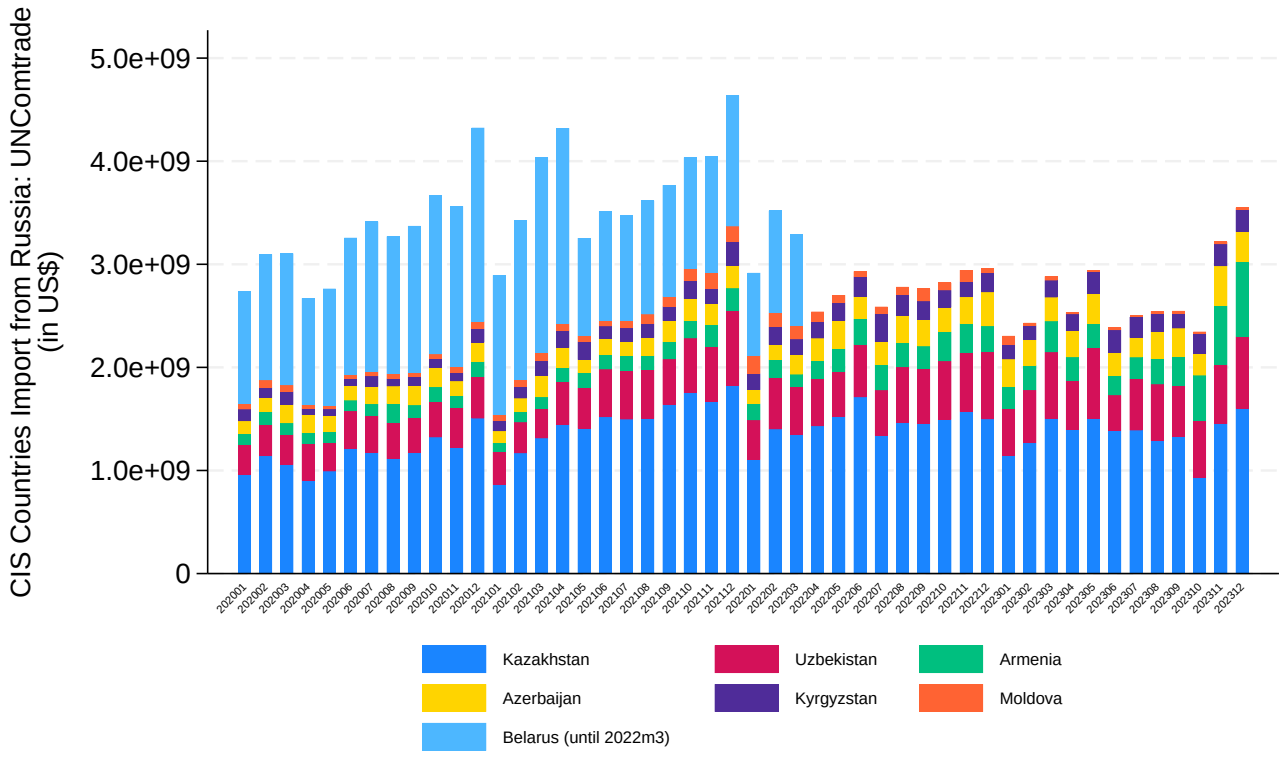
Notes: This graph shows the monthly dynamics of Russian export value to different trading partners.

Figure A.7: UNComtrade CIS Countries Export to Russia



Notes: This figure shows CIS countries' reported exports to Russia. Data source: UN Comtrade.

Figure A.8: UNComtrade CIS Countries Import from Russia



Notes: This figure shows CIS countries' reported imports from Russia. Data source: UN Comtrade.

Table A.20: E.U. New Export Controls against Russia in 2022 and 2023

Publication Date	Products	Notes
February 25, 2022	dual-use goods and technology	Regulation 2022/328 Article 2
February 25, 2022	goods and technology for oil refining	Regulation 2022/328 Article 3b
February 25, 2022	goods and technology for aviation or space industry	Regulation 2022/328 Article 3c
March 9, 2022	goods and technology for maritime navigation	Regulation 2022/394 Article 3f
March 15, 2022	luxury goods	Regulation 2022/428 Article 3h
April 8, 2022	goods and technology for oil refining and liquefaction of natural gas	Regulation 2022/576 revised Article 3b
April 8, 2022	goods and technology for aviation or space industry and jet fuel and fuel additives	Regulation 2022/576 revised Article 3c
April 8, 2022	luxury goods	Regulation 2022/576 revised Article 3h
April 8, 2022	goods which could contribute to enhancement of Russian industrial capacities	Regulation 2022/576 Article 3k
July 21, 2022	goods and technology for oil refining and liquefaction of natural gas	Regulation 2022/1269 revised Article 3b
July 21, 2022	goods which could contribute to enhancement of Russian industrial capacities	Regulation 2022/1269 revised Article 3k
October 6, 2022	goods and technology for aviation or space industry and jet fuel and fuel additives	Regulation 2022/1904 revised Article 3c
October 6, 2022	dual-use goods and technology	Regulation 2022/1904 revised Article 2
December 17, 2022	dual-use goods and technology	Regulation 2022/2474 revised Article 2
December 17, 2022	goods and technology for aviation or space industry and jet fuel and fuel additives	Regulation 2022/2474 revised Article 3c
December 17, 2022	goods which could contribute to enhancement of Russian industrial capacities	Regulation 2022/2474 revised Article 3k
February 25, 2023	dual-use goods and technology	Regulation 2023/427 revised Article 2
February 25, 2023	goods and technology for aviation or space industry and jet fuel and fuel additives	Regulation 2023/427 revised Article 3c
February 25, 2023	goods which could contribute to enhancement of Russian industrial capacities	Regulation 2023/427 revised Article 3k
June 23, 2023	dual-use goods and technology	Regulation 2023/1214 revised Article 2
June 23, 2023	firearms, their parts and essential components and ammunition	Regulation 2023/1214 revised Article 2aa
June 23, 2023	goods which could contribute to enhancement of Russian industrial capacities	Regulation 2023/1214 revised Article 3k

Notes: Article 2 started to list HS codes from Regulation 2022/1904. The last column provides the Council Regulation (EU) number.

Table A.21: U.S. New Export Controls against Russia in 2022 and 2023

Publication Date	Products	Notes
March 3, 2022	CCL Categories 3 to 9	add a new section 746.8
March 8, 2022	industry sector (Supplement no.4)	added to section 746.5
March 16, 2022	luxury goods (Supplement no. 5)	add a new section 746.10
April 14, 2022	All CCL Categories	revise section 746.8
May 11, 2022	industry sector and luxury goods (Supplement no. 4, and 5)	revised
June 6, 2022	industry sector and luxury goods (Supplement no. 4, and 5)	revised
September 16, 2022	industry sector and luxury goods (Supplement no. 4, and 5)	revised
September 16, 2022	chemical and biological weapons related (Supplement no. 6)	add to section 746.5
February 27, 2023	industry sector and luxury goods (Supplement no. 4, and 5)	revised
May 23, 2023	industry sector and luxury goods (Supplement no. 4, and 5)	revised

Notes: CCL denotes "Commerce Control List". Before 2022, there was already a Russian Industry Sector Sanction List that includes the Supplement No. 2 to Part 746 of U.S. Export Administration Regulations with HS codes, and items specified in ECCNs 0A998, 1C992, 3A229, 3A231, 3A232, 6A991, 8A992, and 8D999, where ECCN denotes "Export Control Classification Number". Supplement no.2 and 4 (HS codes) are for Russian industry sector sanction. Supplement no. 5 (HS codes) is for luxury goods. Supplement no.6 are items that may be useful for Russia's chemical and biological weapons production capabilities or may be diverted from Belarus to Russia for these activities of concern.

Table A.22: E.U. New Restrictions on Russian Exports in 2022 and 2023

Publication Date	Products	Sanction Measures	Notes
March 16, 2022	iron and steel products	import ban	Regulation 2022/428 Article 3g
April 9, 2022	iron and steel products	import ban	Regulation 2022/576 revised Article 3g
April 9, 2022	certain products	import ban	Regulation 2022/576 Article 3i
April 9, 2022	coal and other solid fossil fuels	import ban	Regulation 2022/576 Article 3j
June 4, 2022	crude oil or petroleum products	import ban	Regulation 2022/879 Article 3m
June 4, 2022	certain products	import ban	Regulation 2022/879 revised Article 3i
July 22, 2022	gold	import ban	Regulation 2022/1269 Article 3o
October 7, 2022	iron and steel product	import ban	Regulation 2022/1904 revised Article 3g
October 7, 2022	certain products	import ban	Regulation 2022/1904 revised Article 3i
December 5, 2022	crude oil	price cap	Regulation 2022/2368
December 17, 2022	iron and steel product	import ban	Regulation 2022/2474 revised Article 3g part B
February 5, 2023	petroleum products	price cap	Regulation 2023/251
February 25, 2023	certain products	import ban	Regulation 2023/427 revised Article 3i
June 23, 2023	iron and steel product	import ban	Regulation 2023/1214 revised Article 3g
June 23, 2023	certain products	import ban	Regulation 2023/1214 revised Article 3i

Notes: The last column lists the Council Regulation (EU) number. For the oil price cap, crude oil (HS code 2709 00) is limited to 60 USD per barrel, as outlined in Regulation 2022/2368, while the price caps for petroleum products, which vary by product, are specified in Regulation 2023/251.

Table A.23: U.S. New Restrictions on Russian Exports in 2022 and 2023

Publication Date	Products	Sanction Measures	Notes
March 11, 2022	fish, seafood, and preparations thereof; alcoholic beverages; non-industrial diamonds	import ban	E.O. 14068
April 9, 2022	all	suspending normal trade relations	H.R. 7108
April 9, 2022	oil, gas and coal	import ban	H.R. 6968 E.O. 14066
June 27, 2022	certain products	tariff increase	Proclamation 10420
June 28, 2022	gold	import ban	OFAC Determination E.O. 14068
December 5, 2022	crude oil	price cap	OFAC Determination E.O. 14071
February 5, 2023	petroleum products	price cap	OFAC Determination E.O. 14071
March 10, 2023	aluminum and derivative aluminum articles	tariff increase	Proclamation 10522
February 24, 2023	certain products	tariff increase	Proclamation 10523
December 22, 2023	fish,seafood, and preparations thereof	strengthened import ban	OFAC Determination E.O. 14068 E.O. 14114

Notes: H.R. means the U.S. House of Representatives, and legislation with prefix "H.R." indicates that the bill originated from the House. E.O. denotes Executive Order.

Table A.24: Russian Import Top 10 Partner Countries in 2020 and 2023: Our Customs Data

Year 2020	
Country Name	Share
China	17.38%
Germany	10.93%
Austria	7.55%
Switzerland	3.84%
Netherlands	3.74%
United States	3.39%
Italy	3.15%
South Korea	3.02%
Poland	3.00%
Belgium	2.70%
E.U.	47.88%

Year 2023	
Country Name	Share
China	45.17%
Turkey	7.16%
Germany	4.32%
South Korea	3.10%
Belgium	2.68%
Hong Kong	2.23%
Italy	2.07%
UAE	2.04%
Poland	1.99%
Latvia	1.92%
E.U.	23.44%

Notes: This table reports Russian import top 10 partner countries (and E.U.) in 2020 and 2023 using our customs data.

Table A.25: Russian Import Top 10 Partner Countries 2020: UN Comtrade Russia Reported

Country Name	Share
China	23.70%
Germany	10.09%
United States	5.70%
Belarus	5.44%
Italy	4.40%
France	3.49%
South Korea	3.09%
Japan	3.07%
Turkey	2.21%
Kazakhstan	2.18%
E.U.	33.83%

Notes: This table reports Russian import top 10 partner countries (and E.U.) in 2020 using UN Comtrade Russia reported data.

Table A.26: Russian Export Top 10 Partner Countries in 2020 and 2023

Country Name	Share
China	14.33%
Netherlands	9.01%
United Kingdom	6.80%
Germany	5.45%
Turkey	4.70%
South Korea	3.60%
United States	2.91%
Italy	2.73%
Poland	2.71%
Switzerland	2.64%
E.U.	35.41%

Country Name	Share
China	28.83%
India	13.21%
Turkey	11.90%
South Korea	3.08%
United Arab Emirates	2.35%
Belgium	1.92%
Uzbekistan	1.74%
Egypt	1.60%
Brazil	1.60%
Netherlands	1.54%
E.U.	15.38%

Notes: This table reports Russian export top 10 partner countries (and E.U.) in 2020 and 2023 using our customs data.

Table A.27: Russian Top 10 Export Destination Countries 2020: UN Comtrade Russia Reported

Country Name	Share
China	14.58%
Netherlands	7.36%
United Kingdom	6.87%
Germany	5.52%
Belarus	4.74%
Turkey	4.73%
Kazakhstan	4.17%
South Korea	3.70%
United States	3.25%
Italy	2.99%
E.U.	33.76%

Notes: This table reports Russian export top 10 partner countries (and E.U.) in 2020 using UN Comtrade Russia reported data.

Table A.28: Foreign Banks' Asset Growth 21-23

Bank name	Bank code	2021 Asset	2023 Asset	Asset Growth
HSBC	3290	0.09	0.03	-62.25%
Credit Agricole CIB	1680	0.05	0.02	-59.20%
Deutsche Bank	3328	0.13	0.07	-46.14%
Citibank	2557	0.71	0.59	-16.12%
Commerzbank	3333	0.07	0.06	-12.79%
ING Bank	2495	0.11	0.10	-11.89%
UniCredit	0001	1.21	1.12	-7.34%
Raiffeisenbank	3292	1.59	2.04	28.19%
Agricultural Bank of China	3529	0.01	0.02	51.21%
Bank Intesa	2216	0.09	0.16	72.58%
OTP Bank	2766	0.15	0.35	140.76%
China Construction Bank	3515	0.02	0.06	204.87%
ICBC	3475	0.09	0.38	303.57%
J.P. Morgan Bank	2629	0.05	0.27	371.86%
Bank of China	2309	0.10	0.51	401.03%

Notes: The unit of asset is trillion Rubles. The whole Russian banking sector asset growth rate is 29.54% between 2021 and 2023. Data source: Central Bank of Russia.

Table A.29: Commerce Control List Categories

category code	category name
0	Nuclear Materials, Facilities And Equipment (and Miscellaneous Items)
1	Materials, Chemicals, Microorganisms and Toxins
2	Materials Processing
3	Electronics
4	Computers
5	Part 1 – Telecommunications and Part 2 – Information Security
6	Sensors and Lasers
7	Navigation and Avionics
8	Marine
9	Aerospace and Propulsion

Table A.30: Commerce Control List Product Groups

product code	product name
A	End Items, Equipment, Accessories, Attachments, Parts, Components, and Systems
B	Test, Inspection and Production Equipment
C	Materials
D	Software
E	Technology

Table A.31: Top 10 Transaction Banks in Russian Import from E.U.

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Citibank	2557	1158378	10.97%	Yes
Deutsche Bank	3328	914578	8.66%	Yes
Sberbank	1481	883623	8.37%	
UniCredit Bank	0001	821579	7.78%	Yes
Raiffeisenbank	3292	821315	7.78%	Yes
HSBC	3290	587203	5.56%	Yes
Royal Bank of Scotland	2594	404260	3.83%	Yes
VTB Bank	1000	342162	3.24%	
Credit Agricole CIB	1680	282210	2.67%	Yes
ROSBANK	2272	227355	2.15%	

Notes: This table reports the top 10 transaction banks in Russian import from E.U. in 2016.

Table A.32: Top 10 Transaction Banks in Russian Export to E.U.

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Raiffeisenbank	3292	192930	24.08%	Yes
Sberbank	1481	114171	14.25%	
Citibank	2557	46373	5.79%	Yes
VTB Bank	1000	40181	5.02%	
UniCredit Bank	0001	37403	4.67%	Yes
Gazprombank	0354	33625	4.20%	
PJSC Promsvyazbank	3251	19485	2.43%	
COMMERZBANK	3333	13609	1.70%	Yes
Deutsche Bank	3328	13165	1.64%	Yes
Avers Bank	0415	12278	1.53%	

Notes: This table reports the top 10 transaction banks in Russian export to E.U. in 2016.

Table A.33: Top 10 Transaction Banks in Russian Import from China

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Sberbank	1481	194210	12.00%	
Primsotsbank	2733	123442	7.63%	
Citibank	2557	90407	5.58%	Yes
BBR Bank	2929	78904	4.87%	
Alfa-Bank	1326	74229	4.59%	
VTB Bank	1000	69994	4.32%	
OJSC JSCB Primorye	3001	450206	3.64%	
Promsvyazbank	3251	62441	3.86%	
Credit Bank Of Moscow	1978	44514	2.75%	
Raiffeisenbank	3292	41159	2.54%	Yes

Notes: This table reports the top 10 transaction banks in Russian import from China in 2016.

Table A.34: Top 10 Transaction Banks in Russian Export to China

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Sberbank	1481	108365	30.75%	
Social Commercial Bank of Primorye	2733	31187	8.85%	
VTB Bank	1000	27002	7.66%	
Asian-Pacific Bank	1810	19272	5.47%	
Russian Agricultural Bank	3349	12674	3.60%	
Otkritie Bank	2209	10130	2.87%	
Bratskii Ankb	1144	10000	2.84%	
Bank of China	2309	9177	2.60%	Yes
JSCB Primorye	3001	7563	2.15%	
Rosbank	2272	7435	2.11%	

Notes: This table reports the top 10 transaction banks in Russian export to China in 2016.

Table A.35: Top 10 Transaction Banks in Russian Import from U.S.

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Citibank	2557	94974	27.16%	Yes
Sberbank	1481	31034	8.88%	
VTB Bank	1000	24576	7.03%	
PJSC Promsvyazbank	3251	13070	3.74%	
Bank Saint Petersburg	0436	11233	3.21%	
Raiffeisenbank	3292	7142	2.04%	Yes
UniCredit Bank	0001	6427	1.84%	Yes
Alfa-Bank	1326	6148	1.76%	
Vozrozhdenie Bank	1439	5808	1.66%	
Royal Bank of Scotland	2594	5790	1.66%	Yes

Notes: This table reports the top 10 transaction banks in Russian import from U.S. in 2016.

Table A.36: Top 10 Transaction Banks in Russian Export to U.S.

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Sberbank	1481	6886	12.68%	
Citibank	2557	5765	10.62%	Yes
Gazprombank	0354	3999	7.36%	
VTB Bank	1000	3207	5.91%	
UniCredit Bank	0001	2483	4.57%	Yes
PJSC Promsvyazbank	3251	2332	4.29%	
Raiffeisenbank	3292	1515	2.79%	Yes
PROMYShLENNOST' I FINANSY	3307	1218	2.24%	
RosEvroBank	3137	1161	2.14%	
Avers Bank	0415	1152	2.12%	

Notes: This table reports the top 10 transaction banks in Russian export to U.S. in 2016.

Table A.37: Top 10 Transaction Banks in Russian Import from India

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Sberbank	1481	6629	13.01%	
HSBC Bank	3290	4389	8.62%	Yes
PROMYShLENNOST' I FINANSY	3307	4372	8.58%	
Citibank	2557	4133	8.11%	Yes
VTB Bank	1000	2326	4.57%	
Promsvyazbank	3251	1779	3.49%	
UniCredit Bank	0001	1759	3.45%	Yes
ALFA-BANK	1326	1404	2.76%	
Raiffeisenbank	3292	1391	2.73%	Yes
Credit Agricole CIB	1680	1268	2.49%	Yes

Notes: This table reports the top 10 transaction banks in Russian import from India in 2016.

Table A.38: Top 10 Transaction Banks in Russian Export to India

Bank name	Bank code	Transaction count	Count share	Foreign bank?
Sberbank	1481	12538	40.08%	
VTB Bank	1000	3999	12.78%	
Bank Saint Petersburg	0436	1816	5.80%	
UniCredit Bank	0001	1338	4.28%	Yes
JSCB NOVIKOMBANK	2546	1287	4.11%	
GPB OJSC	0354	1058	3.38%	
Avers Bank	0415	1009	3.23%	Yes
Raiffeisenbank	3292	1004	3.21%	Yes
Vneshekonombank	0964	568	1.82%	
Royal Bank of Scotland	2594	449	1.44%	

Notes: This table reports the top 10 transaction banks in Russian export to India in 2016.