To Comply or Not to Comply: Understanding Developing Country Supply Chain Responses to Russian Sanctions

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Abstract

How do firms in neutral developing countries adjust their supply chains in response to geopolitical and economic fragmentation? Do they comply with or circumvent Western sanctions on Russia? Using comprehensive transaction-level bill of lading data from major developing countries, we study these questions in the context of the Russo-Ukrainian War. We find that firms in non-sanctioning countries significantly reduced exports of sanctioned products to Russia (and Belarus) if their headquarters are located in sanctioning countries (i.e., sanctioning MNEs), highlighting MNEs' role in propagating sanctions globally. Domestic firms in developing countries observed a relative increase in such exports, weakening the effect of Western sanctions. Sanctioning MNEs expanded exports of sanctioned products to both sanctioning and Russia-friendly countries, indicating a blend of compliance and non-compliance. Sanctioning MNEs significantly reduced imports from Russia (and Belarus) in financially risky sectors, consistent with the effect of financial sanctions. To strengthen the effectiveness of sanctions, sanctioning countries should use their MNE networks, induce domestic firms in neutral countries to comply, and prevent sanction avoidance of MNEs through indirect exports.

JEL-Codes: F140, F630, O190.

Keywords: global supply chains, geopolitical risk, international conflict.

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1 Introduction

In today's geopolitical landscape that is often characterized as the "New Cold War," many developing countries harbor objectives that do not align with either side of this global rivalry. For instance, while they show little interest in challenging US leadership, they contemplate the extent to which they comply with or evade sanctions against Russia imposed by the US. Developing countries lack incentives to comply, as many sanctions severely restrict trade, yet their economic development largely relies on globalization. Given the crucial role neutral developing countries play in world trade, their non-participation could substantially undermine the effectiveness of Western sanctions.[1]

In this paper, we ask the following questions: How do firms in neutral developing countries adjust their supply chains in response to geopolitical and economic fragmentation? Through what channels do they comply with or bypass sanctions? To answer these questions, we study the trade adjustment to arguably the most significant military conflict in the world today – the Russo-Ukrainian War, focusing on three large developing countries – India, Mexico, and Vietnam – which all have officially declined to participate in Western sanctions against Russia.

The importance of studying non-sanctioning neutral countries' responses to sanctions is evident in Figure 1, which shows a distinct contrast between the trade adjustments of sanctioning and non-sanctioning countries. After the start of the 2022 Russo-Ukrainian War, exports from Western sanctioning countries to Russia and Belarus declined for both sanctioned and non-sanctioned products, with a more pronounced drop in sanctioned products.[2] In contrast, exports from non-sanctioning countries largely rebounded after the war, especially for sanctioned products – an outcome contrary to what Western sanctioning countries intended. This contrast highlights the importance of our research agenda, which focuses on neutral countries, primarily developing economies.
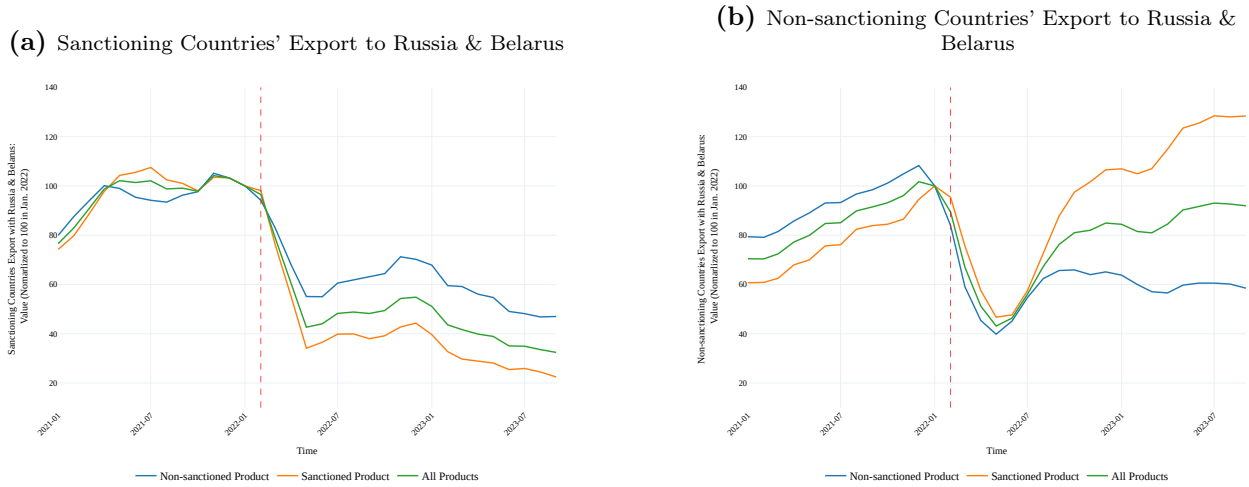
We highlight two important mechanisms through which Western sanctions on Russia (and Belarus) affect supply chains in neutral developing countries: (1) extraterritorial export product sanctions that MNEs from sanctioning countries (sanctioning MNEs) must comply with, and (2) financial sanctions. The US, joined by many Western countries, imposed long-arm export product controls on Russia (and Belarus). These export sanctions require that regardless of the firm's location, if the sanctioned product uses technologies from the sanctioning countries or is manufactured in facilities using sanctioning countries' technologies, it cannot be exported to Russia (and Belarus).[3]

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[1] In 2022, emerging markets and developing economics accounts for 38% of world total export and 45% of import, according to the International Monetary Fund Direction of Trade Statistics.

[2] Sanctioned products refer to those included in the Western countries' export product sanction list and sanctioning countries refer to the countries that have imposed these export product sanctions on Russia (and Belarus), which we will discuss in detail. Specifically, see Section 2.

[3] Violators may face secondary sanctions, meaning that they may face these sanctions themselves (https://www.shearman.com/en/perspectives/2024/02/us-imposes-new-russia-sanctions-and-export-controls–warns-of-risk-of-continued-business-with-russia). In February 2024, the US added over 90 non-Russian individuals and firms to the entity list for aiding Russia in evading sanctions, thereby subjecting them to secondary sanctions (https://www.dentons.com/en/insights/alerts/2024/february/26/us-announces-largest-sanctions-action-to-date–

Figure 1: Export of Sanctioned Products with Russia and Belarus

(a) Sanctioning Countries' Export to Russia & Belarus

(b) Non-sanctioning Countries' Export to Russia & Belarus

Notes: This figure presents sanctioning countries' and non-sanctioning countries' 3-month moving average of monthly export to Russia and Belarus. Each line is normalized such that value = 100 in Jan. 2022.

Sanctioning MNEs are bounded by the export product sanctions and are hence likely to decrease the export of these products more compared to domestic firms and MNEs from non-sanctioning countries (non-sanctioning MNEs). Financial sanctions, such as disconnecting numerous Russian banks from SWIFT and freezing the foreign reserves of the Russian central bank and other banks, may substantially increase production and trade risks in the Russian economy, particularly in sectors that rely heavily on external financing and are financially riskier. Sanctioning MNEs, with enhanced globally sourcing capabilities and their Russian (and Belarusian) trade less likely to be financed by headquarters banks, might reduce imports from Russia (and Belarus) in these sectors to mitigate their risk exposures.

We draw on detailed transaction-level bill of lading data from India, Mexico, and Vietnam, sourced from the S&P, and combine it with the Orbis database. In this way, we identify MNEs and their headquarters' locations, as well as obtain firm-level financial information. We acquire the list of products whose export to Russia (and Belarus) faces the export product sanction and the list of countries that impose similar export product sanctions from the US Bureau of Industry and Security website. We obtain sectoral financial risk measures from Manova (2013) and Manova et al. (2015), and other sector characteristics from Rajan and Zingales (1998), Nunn (2007), and Pierce and Schott (2016).

Our empirical analysis consists of five major parts. We start by documenting changes in neutral developing country supply chains with Russia (and Belarus) before and after the onset of the war. In their exports to Russia (and Belarus), MNEs headquartered in sanctioning countries experienced a larger decline, higher supply chain exit rate, and lower entry rate compared to non-sanctioning

against-russia).

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MNEs and domestic firms within the same developing country. However, sanctioning MNEs did not exhibit a greater import decline from Russia (and Belarus). Extensive margins, specifically firm entry and exit from trade and adding or dropping Russian (and Belarusian) partners, accounted for most of the developing country trade changes with Russia (and Belarus).

We employ a difference-in-differences strategy to identify the effect of sanctions. To implement this strategy, we interact the indicator of a product being on the export sanction list with whether the firm is a multinational headquartered in a sanctioning country, thus generating firm-product level variations. To account for confounding product and firm characteristics, we control for other product attributes and incorporate granular fixed effects. We perform the analysis at various levels, including product, firm-product, and firm-Russian (or Belarusian) firm-product (i.e., supply chain).[4] For the firm-product analysis, firm-time fixed effects will eliminate all time-varying and time-invariant firm and country characteristics, such as domestic policies to the Russo-Ukrainian war. Moreover, product-time fixed effects will remove all time-varying and time-invariant industry characteristics that Russian might have experienced during the war.[5]

Using the difference-in-differences strategy, we document several novel patterns of supply chain adjustments in neutral developing countries to Western sanctions. Firstly, we find that MNEs headquartered in sanctioning countries reduced their exports of sanctioned products to Russia (and Belarus) by 54% more compared to non-sanctioned products. Hence, MNEs from sanctioning countries propagated their headquarters export product sanctions globally and extended their headquarters' geopolitical influence to neutral countries. In contrast, MNEs from non-sanctioning countries and domestic firms did not display this behavior. Sanctioning MNEs significantly reduced exports of products subject to export sanctions more than neutral developing country domestic firms and non-sanctioning MNEs. In relative terms, sanctioning MNEs' exports of sanctioned products to Russia (and Belarus) decreased by 99% more than those by domestic firms. These patterns persist across various levels of analysis: product level, firm-product level, and supply chain level.

Secondly, neutral developing countries' domestic firms experienced a 48% increase in exports of sanctioned products to Russia (and Belarus) relative to non-sanctioned products. This finding is consistent with the motivation of developing country domestic firms to fill the market left by sanctioning MNEs. Furthermore, considering both domestic firms and MNEs together, the total exports of sanctioned products from neutral developing countries to Russia (and Belarus) did not significantly decline after the war compared to non-sanctioned products. This finding implies that the future success of sanctions relies on discouraging domestic firms in neutral countries from exporting to sanctioned nations.

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[4]We define a product at a Harmonized System (HS) 6-digit level.

[5]For example, following the onset of the war, Russian might have transitioned from a normal economy to a war economy, resulting in decreased demand for light manufacturing products and increased demand for products that served as inputs for weapons. These effects can be accounted for by the product-time fixed effect.

Furthermore, we find that exports of sanctioned products by sanctioning MNEs to many non-Russian (and non-Belarusian) destinations increased after the war, indicating both sanction compliance and avoidance behaviors. The rise in exports of sanctioned products to sanctioning countries suggests a genuine effort to find alternative buyers. However, there was also a significant increase in exports of these products to Russia-friendly countries, including the Commonwealth of Independent States and those using Russia's payment system. In contrast, domestic firms and non-sanctioning MNEs exhibited less growth in exports to Russia-friendly countries, as they were less bounded by Western export product sanctions against Russia (and Belarus). Instead, they increased exports more to other countries, likely due to economies of scale and/or learning by doing, since they could expand their exports of sanctioned products to Russia (and Belarus) as sanctioning MNEs reduced their exports of these products.

Our findings are not affected by alternative product characteristics that might correlate with being listed on the export sanction product list. Our baseline specification controls product-time fixed effects. Even in specifications where we cannot include product-time fixed effects, we account for product skill intensity, capital intensity, and whether the product embeds advanced technology in all our empirical specifications. In our robustness test, we additionally control for various product characteristics, including contract intensity and external finance dependence, among others.

Our results are robust to controlling for numerous country characteristics of firms' headquarters. We consider whether the country is an advanced economy, if its GDP per capita is above the median of all headquarters countries in the sample, and various measures of financial stability of the country where their headquarters are located. We also control the firm's import and export shares with sanctioning countries. The significant reduction in sanctioned MNEs' export of products on the export sanction product list remains robust throughout our analysis.

Having documented the significance of export product sanctions in driving export adjustments of sanctioning MNEs, in the last part of the paper, we investigate whether alternative sanction policies, particularly financial sanctions, could reduce these MNEs' imports from Russia (and Belarus). With enhanced global sourcing capabilities and less likelihood of Russian (and Belarusian) trade being financed by headquarters banks, sanctioning MNEs are found to reduce imports from Russia (and Belarus) more significantly in financially riskier sectors. This finding remains robust when considering alternative measures of sectoral financial risks and firm-level financial controls. In contrast, MNEs and domestic firms did not exhibit heterogeneous patterns in exporting to Russia (and Belarus) in financially risky sectors, highlighting the export product sanction as a crucial mechanism affecting exports of sanctioning MNEs.

The paper contributes to the literature on how geopolitical and economic fragmentation (see Aiyar et al. 2023a, Aiyar et al. 2023b, and Gopinath et al. 2024 for surveys) affects global supply chains and economic development. The literature has examined the consequences of various deglobalizing

events, including Brexit (Crowley et al., 2018; Fernandes and Winters, 2021; Graziano et al., 2021), the US-China trade war (Amiti et al., 2019; Flaaen and Pierce, 2019; Fajgelbaum et al., 2020; Handley et al., 2020; Freund et al., 2023; Huang et al., 2023), and COVID (Antràs, 2020; Khanna et al., 2022).[6] Prior works have also studied the impact of 2014 Russia-Ukraine Crisis on trade and production in Ukraine and Russia (Nigmatulina, 2021; Korovkin and Makarin, 2023; Korovkin et al., 2024). Flaaen et al. (2020), Alfaro and Chor (2023), Mayr-Dorn et al. (2023), Utar et al. (2023), Fajgelbaum et al. (2024), Wu (2024), among others, have investigated the impact of supply chain disruptions on trade reallocation to non-conflict countries.[7] Works including Flaaen et al. (2020), McCaig et al. (2022) and Xue (2023) have studied the effect of trade disputes on FDI.

We contribute to this literature by presenting the first empirical evidence on the impact of the 2022 Russo-Ukrainian War and subsequent Western sanctions on Russia and Belarus on developing country supply chains. This conflict, which stands as the largest military confrontation of the 21st century to date, prompted Western countries to impose unprecedented sanctions on Russia (and Belarus). To analyze the effects on global supply chains, we collect detailed and up-to-date supply chain-level information, combined with a novel list of sanctioned export products imposed by Western advanced economies, and headquarters information for developing country importers and exporters. With this comprehensive dataset, we document the spillover effects of the conflict globally and on neutral developing countries. We highlight the heterogeneous responses of MNEs headquartered in sanctioning countries, those from non-sanctioning countries, and developing country domestic firms in their trade relations with Russia (and Belarus) as well as non-Russian (and non-Belarusian) third countries. Furthermore, we reveal that financial sanctions can impede trade, particularly for MNEs importing from Russia (and Belarus).

The paper also contributes to the literature on the economic analysis of sanctions. The literature has explored the motivations behind sanction-sending countries (Eaton and Engers, 1992; Lacy and Niou, 2004; Whang et al., 2013; Baliga and Sjöström, 2022) and has empirically investigated the effects of various sanctions on the recipient (Elliott and Hufbauer, 1999; Lee, 2018; Felbermayr et al., 2020a; Ahn and Ludema, 2020; Crozet et al., 2021; Felbermayr et al., 2021; van Bergeijk, 2022; Hinz and Monastyrenko, 2022; Draca et al., 2023), the sender (Felbermayr et al., 2020b; Gullstrand, 2020; Besedeš et al., 2021), and international trade (Crozet and Hinz, 2020; Miromanova, 2021a,b; Kwon et al., 2022). In the context of Western sanctions following Russia's invasion of Ukraine, De Souza et al. (2024) quantifies cost-efficient trade sanction policies that should be imposed by Western countries under different willingness to pay for sanctions. Sturm (2023), Chowdhry et al. (2023), and Becko (2024) examine trade sanctions theoretically through the lens of terms-of-trade manipulation.

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[6]Works such as Barrot and Sauvagnat (2016), Boehm et al. (2019), Carvalho et al. (2021), Feng et al. (2023), among others, have also studied supply chain disruptions due to natural disasters.

[7]Chen and Joshi (2010), De Souza and Li (2022), Lee et al. (2023), among others, have investigated the trade diversion effects of trade policies.

Bachmann et al. (2022), Evenett and Muendler (2022a), Evenett and Muendler (2022b), Imbs and Pauwels (2023), and Ghironi et al. (2024) study the welfare implications of different trade sanctions using quantitative models. Cai and Xiang (2022) investigates the effect of Western MNEs leaving Russia. Lorenzoni and Werning (2022) and Itskhoki and Mukhin (2022) study the consequences of financial sanctions.

We contribute to this literature by documenting the propagation of Western export sanctions through their MNEs. We discover that these firms, despite being located in neutral developing countries, have incentives to comply with Western extraterritorial export sanctions by reducing sanctioned products to Russia (and Belarus). However, they may also have incentives to circumvent these sanctions by increasing sanctioned product export to countries with stronger economic and political ties to Russia. Consequently, we substantially depart from the existing literature, which has primarily focused on jurisdiction-based sanctions – policies that restrict goods and capital flows between sanctioning countries and Russia (and Belarus). Motivated by the literature that studies sanctions on imports from Russia, we highlight the importance of financial sanctions in reducing MNEs' imports from Russia (and Belarus).

The rest of the paper is organized as follows. Section 2 introduces the institutional background. Section 3 describes the data. Section 4 displays aggregate trade between neutral developing countries and Russia (and Belarus) before and after the war and decomposes the changes into extensive and intensive margins. Sections 5 studies how firms adjust their trade with Russia (and Belarus) and Section 5 studies how firms adjust their trade with other countries, both in response to export product sanctions. Section 7 presents numerous extensions and robustness tests. Section 8 analyzes the role of financial risks in trade adjustments to the war. Section 9 concludes.

2 Institutional Backgrounds and Testable Hypothesis

We highlight two key mechanisms by which Western sanctions on Russia (and Belarus) impact supply chains of neutral developing countries not directly involved in the conflict: (1) export product sanctions that MNEs from sanctioning countries (sanctioning MNEs) must comply with, and (2) financial sanctions. Western MNEs account for a significant share of developing countries' trade with Russia (and Belarus).[8] Their compliance with export control sanctions could substantially reduce these countries' exports to Russia (and Belarus). Financial sanctions considerably increase the cost and risk for Russian (and Belarusian) firms engaging in production, input purchase, and international trade, particularly in sectors with greater reliance on external financing and higher financial risk. MNEs, with advanced global sourcing capabilities, may decrease imports from Russia (and Belarus)

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[8]In 2021, the share of exports to Russia (and Belarus) conducted by MNEs headquartered in sanctioning countries was 61% for Mexico, 13% for Vietnam, and 19% for India. The share of imports from Russia (and Belarus) conducted by MNEs headquartered in sanctioning countries was 35% for Mexico, 3% for Vietnam, and 3% for India.

more than domestic firms with similar characteristics, particularly in these sectors.

MNEs from Sanctioning Countries are Subject to Extraterritorial Export Product Sanctions. Beginning February 24, 2022, three Foreign Direct Product Rules (FDPRs) targeting Russia (and Belarus) were introduced by the US, which significantly restricted exports by US global companies to Russia (and Belarus). These FDPRs require export licenses for products on the industrial sanctions list, and applications for these licenses are denied by default.[9] The industrial sanctions list covers a substantial portion of the neutral developing countries' export to Russia (and Belarus). Products on this list account for 59%, 26%, and 26% of exports by Mexico, Vietnam, and India to Russia (and Belarus), and 37%, 60%, and 25% of imports by Mexico, Vietnam, and India from Russia (and Belarus) (see Section 3.1).

In addition to the US, many Western countries have imposed similar export product sanctions against Russia (and Belarus). Countries within this "export control coalition" are exempt from the US government's license requirements, as they must apply for permits from their own governments and are held accountable by their own governments if they fail to comply. To ensure the coalition's effectiveness, a consistent set of controlled products is required for all member countries.[10] The US Bureau of Industry and Security maintains a list of these exempted countries (see Section 3).

These Export Administration Regulations (EAR) are extraterritorial, as they "follow the goods" – any product manufactured using the sanctioning countries' software or technology or created in a plant employing the sanctioning countries' software or technology becomes subject to these regulations. Even when operating in non-sanctioning countries, MNEs from sanctioning countries (sanctioning MNEs) fall under the scope of these "long-arm" export restrictions as they rely on technologies originating from their headquarters. Moreover, these MNEs face increased risks of prosecution and higher liabilities if found to be in violation of the EAR, compared to domestic firms located in the same non-sanctioning country. Consequently, exports by MNEs from sanctioning countries to Russia (and Belarus) could be significantly constrained by these export sanctions. These institutions lead us to formulate our first testable hypothesis:

Hypothesis 1. Sanctioning MNEs, even when they are located in neutral developing countries, experienced a greater reduction in their exports of sanctioned products to Russia (and Belarus)

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[9]In addition to the industrial sanctions list, there are two other FDPRs: the Commerce Control List (CCL) and the Russian Entity List. The CCL covers high-tech products identified with an Export Control Classification Number (ECCN). Restricted ECCNs for Russia cover almost all high-tech manufacturing products, falling under CCL categories 3-9. The Russian Entity List comprises over 800 entities, with more than 600 located in Russia. The remaining entities, situated in other countries, are considered crucial for Russia's military capabilities or for evading sanctions. Exports to entities on the Russian Entity List are prohibited. In this paper, we focus on the industrial sanctions list due to its analytical feasibility. See https://www.state.gov/russia-business-advisory/ for more details.

[10]See https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2024/01/ukraine-the-latest-global-sanctions-and-export-controls-03%20January-2024.pdf.

compared to domestic firms and MNEs from non-sanctioning countries (non-sanctioning MNEs).

If sanctioning MNEs had to decrease their export of sanctioned products to Russia (and Belarus), due to trade diversion, Russian (and Belarusian) buyers may replace sanctioning MNEs with domestic firms and non-sanctioning MNEs as sources of the sanctioned products. Moreover, a shortage of sanctioned products in Russia (and Belarus) would reduce their ability to export these products to neutral developing countries, subsequently leading to a reduction in imports of these products by neutral developing countries from Russia (and Belarus).

Hypothesis 2. If the sanctions successfully reduced the export of sanctioned products to Russia (and Belarus) by sanctioning MNEs, domestic firms and non-sanctioning MNEs would likely boost their exports of the controlled products to Russia (and Belarus).

Hypothesis 3. The shortage of sanctioned products in Russia (and Belarus) would have led to a decrease in imports of those products from Russia (and Belarus) by neutral developing countries.

As sanctioning MNEs faced export product sanctions when directly exporting to Russia (and Belarus), they may have needed to seek alternative export markets. In particular, if they were motivated to bypass these sanctions, they might have increased the export of sanctioned products to Russia-friendly countries, such as the Commonwealth of Independent States (CIS) countries. We will revisit this point when discussing the institutions of financial sanctions.[11]

In contrast, domestic firms and non-sanctioning MNEs, being less constrained by the export product sanctions against Russia (and Belarus), may have had fewer incentives to redirect their exports through Russia-friendly countries. However, as these firms could increase their exports to Russia (and Belarus) while sanctioning MNEs reduced theirs, economies of scale and/or learning by doing might have made developing country domestic firms and non-sanctioning MNEs more competitive at the sanctioned products.[12] Consequently, they might expand their exports of these products to other markets, such as the sanctioning countries.

Hypothesis 4. Sanctioning MNEs might bypass sanctions by increasing exports of sanctioned products to Russia-friendly countries. In contrast, domestic firms and non-sanctioning MNEs might be less motivated to export sanctioned products to Russia-friendly countries, but they might increase exports of these products to other markets.

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[11]Many anecdotal evidence and reports documented avoidance of export sanctions through Russia-friendly countries (e.g., Kupatadze and Marat 2023).

[12]Fajgelbaum et al. (2024) provide evidence of Vietnamese exports benefiting from economies of scale and increasing exports to all countries in the context of the US-China Trade War. News reports indicate that Chinese exporters learned to produce items previously made by sanctioning countries, substituting them as supplies of sanctioned products to Russia (and Belarus) ceased (see https://en.thebell.io/how-russia-uses-china-to-get-round-sanctions/).

Unprecedented Financial Sanctions were Imposed. Western countries imposed unprecedented financial sanctions on Russia (and Belarus). This impact was particularly significant for sectors that relied on trade finance and extensive external financing, as well as for firms trading with Russia (and Belarus) with weaker financial conditions. The most notable measure was banning numerous Russian banks from SWIFT, which severely limited their ability to settle international payments.[13] Additional sanctions involve freezing Russian banks' and the central bank's US dollar, Euro, and gold reserves.[14] Financial sanctions weakened Russian (and Belarusian) firms' international trade capacities, as they struggled to pay for foreign exports and accept payments for imports in sanctioning currencies. Consequently, trade partners faced increased risks of default from Russian (and Belarusian) importers and non-delivery by Russian (and Belarusian)exporters. Risks in production and input acquisition also increased. Firms that traded with Russia (and Belarus) with weaker financial health were more vulnerable to these financial risks and might hence reduce their exposure by reducing trade with Russia (and Belarus) more.

To bypass financial sanctions, Russia has increasingly adopted alternative payment systems and currencies for settling international transactions and channeled trade through third countries. Substitutes for SWIFT include Russia's System for Transfer of Financial Messages (SPFS).[15] Additionally, Russia may have increased trade via third countries that are not subject to immediate financial sanctions. Anecdotal evidence suggests that firms aiming to maintain trade with Russia, both from developing and developed countries, have increasingly traded with countries sharing non-SWIFT payment networks with Russia and Russia-friendly countries.[16] By settling payments in sanctioning currencies with these third countries, who then transship goods to Russia (and Belarus), firms can continue trading while minimizing risks due to Russian (and Belarusian) sanctions, as they are not directly trading with Russia (and Belarus). These discussions lead to the next hypothesises:

Hypothesis 5. Trade with Russia (and Belarus) may experience a greater reduction in financially riskier sectors, especially for firms with weaker financial health.

Hypothesis 6. Sanctioning MNEs might bypass sanctions by increasing exports of sanctioned products to countries that utilize SPFS payment network.

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[13]See, https://foreignpolicy.com/2022/03/08/swift-sanctions-ukraine-russia-nato-putin-war-global-finance/.

[14]Financial sanctions also include the seizing and freezing of assets belonging to Russian individuals and entities that support the war, such as the oligarchs.

[15]Users of SPFS include Armenia, Belarus, Cuba, Germany, India, Iran, Kazakhstan, Kyrgyzstan, and Switzerland (see, https://www.reuters.com/article/idUSL8N2YG2D8/). Since Germany and Switzerland imposed sanctions on Russia following the outbreak of the 2022 Russo-Ukrainian War, we exclude them from our analysis of trade diversion to SPFS countries.

[16]See, for example, https://www.euractiv.com/section/economy-jobs/news/eu-sanctions-on-russia-massively-circumvented-via-third-countries-study-finds/.

Imports by Sanctioning MNEs are not Exposed to Extraterritorial Product Sanctions. However, They might Reduce Import from Russia Due to Financial Sanctions. Although many Western countries have imposed stringent restrictions on imports from Russia, including revoking Russia's Most Favored Nation (MFN) status, increasing tariffs, and implementing an oil embargo (see De Souza et al. 2024 and others), the majority of these sanctions remain bounded by jurisdictions and do not extend to firms operating in developing countries. Sanctions on Russian shipping companies and increased shipping insurance cost on trade with Russia (Evenett and Muendler, 2022a) may reduce other countries' import from Russia.[17] However, they may create similar impacts on developing country domestic firms and sanctioning MNEs if the two types of firms are similarly affected by the rise in trade costs.

Despite the absence of extraterritorial sanctions on imports from Russia (and Belarus), MNEs from sanctioning countries might still voluntarily reduce imports in comparison to developing country domestic firms due to financial sanctions. With enhanced sourcing capabilities, MNEs could find alternative input sources and shift their supply chains further away from Russia (and Belarus), thus reducing financial risk exposures. In comparison to developing country domestic firms and MNEs from non-sanctioning countries, MNEs from sanctioning countries were also less likely to receive bank financing for trade with Russia from banks in their headquarters, which have imposed sanctions against Russia.[18] This leads to additional costs associated with maintaining their import source in Russia (and Belarus).

Hypothesis 7. Compared to domestic firms and non-sanctioning MNEs, sanctioning MNEs might decrease import from Russia (and Belarus) more in financially riskier sectors.

Agricultural Products were Exempt from Sanctions For humanitarian reasons, export product sanctions and financial sanctions do not apply to trade with Russia involving agricultural products. This exemption covers products such as crops, food, and chemicals necessary for food production, including pesticides and fertilizers.[19] Therefore, in the body of the empirical analysis, we focus on the manufacturing sector.

Summary Large-scale sanctions, which transmit to neutral developing countries not directly involved in the conflict, distinguish the Russo-Ukrainian War from previously studied conflicts and natural disasters. MNEs from sanctioning countries faced significant export restrictions, even when

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[17]See, https://www.reuters.com/markets/commodities/indias-oil-imports-russia-hit-12-month-low-jan-sanctions-bite-2024-02-01/.

[18]See, for example, https://www.americanbanker.com/payments/list/these-payment-companies-are-cutting-off-russia, which shows that Western banks closely examined financial transactions potentially related to trade with Russia.

[19]See https://crsreports.congress.gov/product/pdf/IF/IF12092.

located in non-sanctioning developing countries. In contrast, imports by MNEs from sanctioning countries did not face similar extraterritorial regulations, but they might voluntarily reduce trade with Russia (and Belarus) as a consequence of financial sanctions. Trade in agricultural-related products remained exempt from such sanctions.

3 Data

We combine international transaction bill of lading data from S&P Panjiva, firm balance sheet information from Orbis, and industry-level measures from various sources. Our sample spans between 2021Q1 and 2023Q3, and we focus on the firms that have ever traded with Russia or Belarus during this period. In our quarterly analysis, we define the pre-war period as 2021Q1 to 2021Q4 and the post-war period as 2022Q1 to 2023Q3. We choose not to extend the pre-war period into 2020 due to potential confounding effects from the COVID pandemic and subsequent government lockdowns. To calculate aggregate trade value growth from the pre-war to the post-war periods (reported in Section 4), taking into account the differences in time frames, we need to multiply the pre-war trade values by 7/4. This is because the pre-war period includes 4 quarters, while the post-war period includes 7 quarters.

S&P Panjiva Bill of Lading Data We acquire transaction-level supply chain data for major developing countries – India, Mexico, and Vietnam. For these countries both export and import transactions for all modes of transit are reported, and data is continuously updated from the vendor.[20] We observe information on the importer and exporter firm, product, and dollar values of each transaction. For firm-level information, the countries, names, and addresses are available. For firms in Mexico and Vietnam, we are also able to retrieve unique firm identifiers. Since the Orbis Database also has the same set of unique firm identifiers, we are able to match firms across the two datasets in these two countries accurately.[21] Depending on the purpose of analysis, we aggregate transactions either at the monthly or quarterly level.

The bill of lading data for these countries exhibit low missing rates and have a strong correlation with UN Comtrade's official trade statistics when aggregated at the product level.[22] From 2021Q1 to 2023Q3, the missing rates (the share of transactions where the value information is not provided) for

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[20]S&P do not receive data from all countries. Specifically, Chinese bill of lading data are not included since around the beginning of the US-China trade war, and Brazilian data only capture a subset of transactions through maritime trade, with the majority of transactions not reporting trade values. Consequently, we exclude these two countries from our analysis.

[21]In the Mexican data, we can observe the Mexico RFC (Registro Federal de Contribuyentes), whereas in the Vietnamese data, we can see the Trade Register Number. Orbis also provides the corresponding IDs for both countries, enabling us to accurately match the datasets for these two countries.

[22]Flaaen et al. (2023) provides further insights into the benefits and limitations of the S&P Panjiva Bill of Lading data in the US, in comparison to the US Longitudinal Firm Trade Transactions Database.

Mexico's import and export values are both below 0.01%. For Vietnam's export and import, the missing rates are 1.499% and 3.554%. For India, the missing rates of value for exports and imports are 0.012% and 5.137%, respectively. Figure A.1 demonstrates that the trade values derived from S&P and those from UN Comtrade at the product level exhibit a high correlation for both pre-war and post-war periods.[23]

Orbis   To acquire headquarters and financial information for firms in S&P Panjiva, we match them with the Orbis database.[24] Utilizing Orbis' batch search tool, we input firm national IDs (for Mexico and Vietnam), names, and addresses. The search portal subsequently returns the most accurate match for each firm within the Orbis database.[25] We then download the balance sheet and ownership information for these matched firms.

Utilizing the global ultimate owner information from Orbis, we determine whether a firm is domestic or a subsidiary of a foreign MNE. If it is an MNE, we determine if its headquarters is located in a sanctioning country. We refer to an MNE originating from a sanctioning country as a *sanctioning MNE*, and one headquartered in a country that did not participate in these sanctions on Russia (and Belarus) as a *non-sanctioning MNE*.[26]

Export Product Sanction List and List of Sanctioning Countries   We obtain the list of products subject to export product sanctions and their corresponding Harmonized System (HS) codes from the websites of the Export Administration Regulations (EAR), issued by the Bureau of Industry and Security (BIS) under the U.S. Department of Commerce.[27] Specifically, Supplement No. 2 of Part 746 of EAR outlines the products critical to Russia's oil industry. Supplement No. 4 targets a broader list of industry sector products. Supplement No. 5 provides lists of luxury goods. Supplement No. 7 includes high-tech products such as aircraft engines and microprocessors. Each of these documents provides HS codes for the products within their respective categories that are subject to export product sanctions.

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[23]These figures present trade values from S&P Panjiva and UN Comtrade at the 6-digit HS Code level, covering both pre-war and post-war periods. Each data point refers to the trade flow value of a product between a developing country and Russia and Belarus, as calculated by S&P Panjiva and reported in UN Comtrade. Data for India, Mexico, and Vietnam is pooled together.

[24]Orbis, published by the Bureau van Dijk, a Moody's Analytics company, is a database containing information about private and public companies worldwide. It covers over 400 million companies across more than 200 countries and offers an extensive range of business and financial information on global enterprises.

[25]For all unmatched firms, we manually search for potential matches in Orbis to account for any discrepancies resulting from spelling errors. The overall matching rate, defined as the number of matched firms over the total number of firms in Panjiva, is 96.39% for Mexico, 95.44% for Vietnam, and 90.41% for India.

[26]Non-sanctioning headquarters countries in our sample include United Arab Emirates, Argentina, Bahrain, Bermuda, Brazil, Belize, Chile, China, Curaçao, Egypt, Hong Kong, Indonesia, Israel, India, North Korea, Cayman Islands, Sri Lanka, Monaco, Mauritius, Mexico, Malaysia, Panama, Pakistan, Russia, Saudi Arabia, Singapore, Thailand, Turkey, Ukraine, Uruguay, British Virgin Islands, Vietnam, and South Africa.

[27]See https://www.bis.doc.gov/ear and https://www.ecfr.gov/current/title-15/subtitle-B/chapter-VII/subchapter-C/part-746.

Supplement No. 3 of Part 746 of EAR identifies countries that have imposed similar export product sanctions on Russia (and Belarus). Countries on this list "have committed to implementing substantially similar export controls," and are therefore exempt from license requirements by the US government when their firms export to Russia (and Belarus).[28] Together with the U.S., we define a total of 39 sanctioning countries that have imposed export product sanctions on Russia (and Belarus).

Sectoral Financial Risks and Other Sector Characteristics We acquire sectoral financial risk measures following the methodology in Manova et al. (2015). Like them, we collect ISIC 4-digit level external finance dependence (from Rajan and Zingales 1998), (the negative of) asset tangibility, (the negative of) trade credit intensity, and inventory ratio. To derive a single index, we compute the first principal component of the four financial risk measures. Furthermore, we calculate the mean of the standardized financial risk measures, which serves as a robustness test.

Additionally, we obtain several time-invariant industry-level characteristics from various sources. The industry capital and skill intensity and the indicator for entailing advanced technology are taken from Pierce and Schott (2016), contract intensity is from Nunn (2007), and external financial dependence is from Rajan and Zingales (1998).[29]

Other Country-level Trade and Macro-financial Statistics We determine whether a country is an advanced economy based on the IMF classifications. We obtain measures of a country's financial stability, including the liquid liability to GDP ratio, central bank assets to GDP ratio, deposit money bank assets to GDP ratio from Nunn (2007), which are updated in the World Bank Global Financial Development Database.

3.1 Summary Statistics

Supply Chains Table 1 shows that in the pre-war period, 151 Mexican firms (with 39 sanctioning MNEs), 740 Vietnamese firms (with 39 sanctioning MNEs), and 2733 Indian firms (with 182 sanctioning MNEs) exported to Russia (and Belarus). On average, sanctioning MNE exporters were larger than non-sanctioning MNE and domestic exporters in terms of number of products, partner count, number of supply chains, and export value per firm, consistent with Bernard et al. (2009).

In the post-war period, Table 2 shows the number of exporters has decreased to 111 in Mexico

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[28]These countries include Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Taiwan, United Kingdom.

[29]Like in Pierce and Schott (2016), the advanced technology indicator is set to one if the NAICS industry corresponds, at least partially, to a ten-digit HS product classified as an advanced technology product by the US International Trade Commission. The HS-NAICS concordances are sourced from Pierce and Schott (2012).

but increased to 792 in Vietnam and 2733 in India. The majority of the exporter number growth in Vietnam and India stems from domestic firms, while the count of sanctioning MNEs remained stable or decreased. The export value per sanctioning MNE has almost entirely eliminated the premium over non-sanctioning MNEs and domestic firms in the pre-war period. Non-sanctioning MNEs have the highest export value per firm during the post-war period.

Table 3 and 4 show that during the pre-war period, 127 Mexican firms (including 46 sanctioning MNEs), 647 Vietnamese firms (including 34 sanctioning MNEs), and 1689 Indian firms (including 1564 sanctioning MNEs) imported from Russia (and Belarus). In the post-war period, the numbers changed to 93 Mexican firms (with 35 sanctioning MNEs), 611 Vietnamese firms (with 32 sanctioning MNEs), and 1654 Indian firms (with 91 sanctioning MNEs). Unlike exporters to Russia (and Belarus), sanctioning MNEs are not significantly larger than non-sanctioning MNEs and domestic firms in terms of imports. Moreover, no group of importers displayed a considerable decline in import value per firm between the pre-war and post-war periods.

Table 1: Pre-war Exports Summary Statistics by MNE Status

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	All	151	3.2	2.0	6.0	1.9	3.0	608,648	101,891
	Sanctioning MNEs	39	6.3	2.6	14.8	2.4	5.6	1,428,231	96,202
	Non-santioning MNEs	37	2.1	2.3	3.4	1.6	1.5	386,274	115,259
	Domestic	75	2.1	1.5	2.7	1.2	1.7	292,169	110,114
Vietnam	All	740	3.4	2.3	5.1	1.5	2.3	1,046,146	203,670
	Sanctioning MNEs	39	5.5	2.0	6.8	1.2	3.4	2,478,424	366,131
	Non-santioning MNEs	16	3.3	1.6	3.8	1.2	2.3	1,084,429	284,440
	Domestic	685	3.2	2.3	5.1	1.6	2.2	963,706	189,913
India	All	2,733	2.9	2.4	4.9	1.7	2.0	1,285,303	262,379
	Sanctioning MNEs	182	3.9	2.5	6.9	1.7	2.8	3,705,622	539,970
	Non-santioning MNEs	26	1.8	2.8	3.3	1.8	1.2	617,726	188,952
	Domestic	2,525	2.9	2.4	4.8	1.7	2.0	1,117,723	234,134

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each MNE type for exports in the pre-war periods. A firm's MNE type is based on its global ultimate owner country.

Additionally, Tables A.1 - A.4 present trade statistics at the firm, product, trade partner, and supply chain levels for broad sectors (agriculture, mining and energy, durable manufacturing, and non-durable manufacturing). Tables A.5 - A.9 display the shares of sanctioning MNEs, non-sanctioning MNEs, and domestic firms in terms of total number of firms, products, trade partners, supply chains, and trade values for both exports and imports across all sectors during both pre-war and post-war periods.

Table 2: Post-war Exports Summary Statistics by MNE Status

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	All	111	3.3	2.0	5.6	1.7	2.8	487,200	87,224
	Sanctioning MNEs	29	3.0	1.4	4.9	1.6	3.4	554,712	114,090
	Non-santioning MNEs	26	1.7	3.3	4.2	2.5	1.3	585,611	139,687
	Domestic	56	4.1	1.7	6.6	1.6	3.9	406,547	61,531
Vietnam	All	792	3.6	2.4	5.6	1.6	2.3	1,545,322	276,524
	Sanctioning MNEs	37	6.0	2.9	8.1	1.4	2.8	1,526,232	187,610
	Non-santioning MNEs	20	3.7	2.1	5.5	1.5	2.6	3,295,194	604,623
	Domestic	735	3.5	2.4	5.5	1.6	2.3	1,498,667	274,283
India	All	3,780	4.4	3.2	8.5	1.9	2.6	1,668,207	195,408
	Sanctioning MNEs	189	3.6	2.6	5.8	1.6	2.2	1,652,316	283,898
	Non-santioning MNEs	26	2.3	4.0	5.4	2.3	1.3	2,193,868	407,433
	Domestic	3,565	4.4	3.3	8.7	2.0	2.7	1,665,215	191,315

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each MNE type for exports in the post-war periods. A firm's MNE type is based on its global ultimate owner country.

Table 3: Pre-war Imports Summary Statistics by MNE Status

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	All	127	3.4	1.4	3.8	1.1	2.7	281,725	74,852
	Sanctioning MNEs	46	3.0	1.3	3.5	1.2	2.6	271,492	77,090
	Non-santioning MNEs	26	2.4	1.3	2.6	1.1	2.0	190,487	72,833
	Domestic	55	4.1	1.5	4.5	1.1	3.1	333,413	73,942
Vietnam	All	647	2.3	2.1	3.5	1.5	1.6	1,982,592	569,093
	Sanctioning MNEs	34	1.6	2.1	2.6	1.6	1.2	1,054,797	402,956
	Non-santioning MNEs	16	1.1	1.8	1.8	1.6	1.0	1,226,992	701,138
	Domestic	597	2.4	2.1	3.6	1.5	1.7	2,055,681	574,283
India	All	1,689	2.0	3.4	4.4	2.2	1.3	6,056,204	1,381,168
	Sanctioning MNEs	101	2.4	2.1	3.5	1.5	1.7	3,381,047	959,230
	Non-santioning MNEs	24	2.0	2.0	3.0	1.5	1.5	13,410,508	4,470,169
	Domestic	1,564	2.0	3.5	4.5	2.3	1.3	6,116,106	1,370,821

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each MNE type for imports in the pre-war periods. A firm's MNE type is based on its global ultimate owner country.

Sanctioned Products   Table A.10 shows that 2131 or 38% of all 6-digit Harmonized System product codes were included in the export product sanction list. In terms of exports to Russia (and Belarus), these codes account for 59% for Mexico, 26% for Vietnam, and 26% for India. In terms of imports from Russia (and Belarus), they account for 37% for Mexico and 60% for Vietnam. A majority of sanctioned products are concentrated in the durable manufacturing sector. Table A.11

Table 4: Post-war Imports Summary Statistics by MNE Status

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	All	93	3.0	1.4	3.3	1.1	2.3	469,404	143,130
	Sanctioning MNEs	35	2.4	1.2	2.5	1.0	2.0	682,242	277,656
	Non-santioning MNEs	16	1.1	1.3	1.4	1.3	1.1	168,428	117,167
	Domestic	42	4.2	1.6	4.7	1.1	2.9	406,696	87,149
Vietnam	All	611	2.7	2.1	4.1	1.5	1.9	3,046,509	737,487
	Sanctioning MNEs	32	1.6	2.2	2.7	1.7	1.3	1,495,254	549,979
	Non-santioning MNEs	14	1.3	1.5	1.6	1.3	1.1	1,034,343	629,600
	Domestic	565	2.8	2.2	4.3	1.5	2.0	3,184,227	745,273
India	All	1,654	2.5	3.1	4.9	2.0	1.6	60,096,157	12,149,987
	Sanctioning MNEs	91	3.7	2.2	5.3	1.5	2.4	14,266,389	2,682,317
	Non-santioning MNEs	21	1.5	3.1	3.7	2.5	1.2	36,465,581	9,945,158
	Domestic	1,542	2.4	3.1	4.9	2.1	1.6	63,122,584	12,773,625

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each MNE type for imports in the post-war periods. A firm's MNE type is based on its global ultimate owner country.

shows the post-war statistics for products subject to export sanctions. For instance, the share of sanctioned products in neutral developing country trade significantly decreased for Mexican exports but increased for both Vietnamese and Indian exports.

We also document that sanctioning countries significantly reduced exports of sanctioned products to Russia (and Belarus) whereas non-sanctioning countries, as a whole, increased exports of sanctioned products to Russia (and Belarus). Figure 1 demonstrates that, using UN Comtrade data, in terms of percentage changes, sanctioning countries decreased exports of sanctioned products (80% reduction from pre-war to post-war) more than exports of non-sanctioned products to Russia (and Belarus, with a 50% reduction from pre-war to post-war). However, non-sanctioning countries, when pooled together, reduced their exports of non-sanctioned products to Russia (and Belarus, with a 40% decrease from pre-war to post-war) but increased their exports of sanctioned products to Russia (and Belarus, with a 20% increase).

4 Trends and Turnover Statistics

In this section, we present several facts about the changes in MNEs and supply chains in developing countries from pre-war to post-war periods. We also decompose the changes in developing countries' trade with Russia (and Belarus) into extensive and intensive margins.

4.1 Developing Country Supply Chains with Russia and Belarus

Observation 1. *MNEs headquartered in sanctioning countries exhibited a greater export decline, a higher supply chain exit rate, and a lower supply chain entry rate compared to non-sanctioning MNEs and domestic firms within the same host country.*

Table 5 shows that exports by MNEs headquartered in sanctioning countries significantly decreased compared to those from non-sanctioning countries and domestic firms in developing countries. Compared to the other two groups of firms, sanctioning MNEs had the greatest contribution to the overall decrease in developing country exports to Russia (and Belarus). In Mexico, exports by sanctioning MNEs, non-sanctioning MNEs, and domestic firms declined by 84%, 39%, and 41%, respectively, with sanctioning MNEs accounting for 76% of the total export decrease. In Vietnam, exports by sanctioning MNEs decreased by 67% and by domestic firms by 5%, while non-sanctioning MNEs experienced a 117% increase. Sanctioning MNEs contributed to 86% of the total decline in Vietnamese exports to Russia (and Belarus). In India, exports by sanctioning MNEs declined by 74%, but non-sanctioning MNEs and domestic firms experienced growth of 103% and 20%, respectively, leading to a 3% increase in Indian total exports to Russia (and Belarus).

Table 5: Export Entry and Exit Rates by MNE Status

Country	Type	Value Growth	Contribution	Exit rate			Entry rate		
				Supply Chain	Firm-Product	Firm	Supply Chain	Firm-Product	Firm
Mexico	All	-66.38%	100.00%	0.73	0.53	0.32	0.61	0.62	0.20
	Sanctioning MNEs	-83.50%	76.24%	0.79	0.58	0.29	0.48	0.31	0.21
	Non-sanctioning MNEs	-39.12%	9.17%	0.58	0.45	0.31	0.56	0.24	0.12
	Domestic	-40.63%	14.59%	0.67	0.50	0.35	0.70	0.76	0.26
Vietnam	All	-9.66%	100.00%	0.41	0.30	0.18	0.48	0.34	0.21
	Sanctioning MNEs	-66.62%	86.11%	0.25	0.21	0.12	0.30	0.21	0.08
	Non-sanctioning MNEs	117.05%	-27.16%	0.25	0.20	0.16	0.59	0.41	0.34
	Domestic	-4.65%	41.05%	0.43	0.31	0.19	0.49	0.35	0.21
India	All	2.58%	100.00%	0.55	0.30	0.15	0.78	0.56	0.31
	Sanctioning MNEs	-73.54%	-547.48%	0.56	0.31	0.20	0.56	0.38	0.31
	Non-sanctioning MNEs	102.94%	18.25%	0.53	0.29	0.28	0.62	0.26	0.15
	Domestic	20.20%	629.23%	0.55	0.30	0.15	0.78	0.57	0.31

Notes: This table presents the changes in export values to Russia (and Belarus) for each country and by MNE status, from pre-war to post-war periods. It also shows sectoral contributions to country-level export changes and the exit-entry rates at various levels, including supply chain, firm-product, and trading firm. Trade growth is computed with the method discussed in Section 3, taking into account the different time window lengths between the pre-war and post-war periods.

Supply chains through which developing countries export to Russia (and Belarus) were significantly disrupted by the war and ensuing sanctions, featuring high exits and turnovers, particularly for sanctioning MNEs.[30] Table 5 further shows that sanctioning MNEs displayed higher exit rates and

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[30]In line with Broda and Weinstein (2010) and other, we define the exit rate as the ratio of the number of exiters to the sum of exiters and continuers, while the entry rate is defined as the ratio of the number of entrants to the sum of

lower entry rates at both the supply chain level and firm-product level. Regardless of MNE status, trading firms in these stand-by developing countries experienced higher exit rates and turnovers, compared to other developing and advanced countries during normal times (see Kasahara and Tang 2019 for China, Alvarez and López 2005, 2008 for Chile, Bernard and Wagner 2001 for Germany, and Bernard et al. 2009 for US). These findings suggest that the conflict and sanctions considerably amplified the destruction and creation of supply chains.

Table A.12 shows that the durable sector, compared to agriculture, mining and energy, and the nondurable sector, contributed the most to the overall decline in exports from developing countries to Russia (and Belarus). These sectoral heterogeneity can be attributed to the high output share of MNEs in the durable sector (Li, 2023). Additionally, durable sectors require more financing for production and trade (Ahn et al., 2011), which makes them more vulnerable to the effects of financial sanctions.

Observation 2. *MNEs headquartered in sanctioning countries did not display a more pronounced import decline from Russia (and Belarus) compared to non-sanctioning MNEs and domestic firms.*

Table 6: Import Entry and Exit Rates by MNE Status

Country	Type	Value Growth	Contribution	Exit rate			Entry rate		
				Supply Chain	Firm-Product	Firm	Supply Chain	Firm-Product	Firm
Mexico	All	-30.28%	100.00%	0.80	0.73	0.47	0.62	0.62	0.34
	Sanctioning MNEs	9.26%	-10.67%	0.77	0.71	0.45	0.48	0.55	0.34
	Non-sanctioning MNEs	-68.91%	31.50%	0.74	0.71	0.45	0.38	0.33	0.24
	Domestic	-46.77%	79.17%	0.84	0.75	0.51	0.74	0.68	0.38
Vietnam	All	-17.08%	100.00%	0.66	0.44	0.25	0.70	0.46	0.21
	Sanctioning MNEs	-23.76%	3.89%	0.50	0.25	0.13	0.51	0.27	0.14
	Non-sanctioning MNEs	-57.85%	5.18%	0.50	0.20	0.18	0.45	0.21	0.12
	Domestic	-16.23%	90.93%	0.67	0.45	0.26	0.71	0.47	0.21
India	All	455.28%	100.00%	0.71	0.45	0.31	0.76	0.52	0.30
	Sanctioning MNEs	117.24%	0.86%	0.65	0.52	0.32	0.78	0.67	0.28
	Non-sanctioning MNEs	35.96%	0.25%	0.65	0.51	0.26	0.62	0.23	0.11
	Domestic	481.46%	98.89%	0.71	0.44	0.31	0.76	0.51	0.30

Notes: This table presents the changes in import values from Russia (and Belarus) for each country and by MNE status, from pre-war to post-war periods. It also shows sectoral contributions to country-level import changes and the exit-entry rates at various levels, including supply chain, firm-product, and trading firm. Trade growth is computed with the method discussed in Section 3, taking into account the different time window lengths between the pre-war and post-war periods.

Table 6 shows that the decrease in imports by sanctioning MNEs was not significantly greater than that of non-sanctioning MNEs and domestic firms. This observation is consistent with Western countries' export product sanction regimes, which impose strict extraterritorial export restrictions on firms utilizing Western technologies, but not on imports. That said, the absence of a more significant

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entrants and continuers.

decrease in sanctioning MNEs' imports may be associated with their high shares in products that experienced substantial export growth from Russia (and Belarus) to developing countries, such as energy. Moreover, sanctioning MNEs might reduce imports from Russia (and Belarus) more in certain sectors (likely the financially riskier ones) than others, points we will further investigate in Section 8. In contrast to exports, domestic firms played a more significant role in driving changes in developing country import from Russia (and Belarus), rather than sanctioning or non-sanctioning MNEs.

Import supply chains from Russia (and Belarus) in other countries were also significantly disrupted, characterized by high exit rates and turnovers. For example, 80% of Mexican pre-war importing supply chains from Russia disappeared after the war, whereas entrants accounted for 62% of post-war supply chains. Unlike exports, sanctioning MNEs did not display significantly higher exit rates and lower entry rates for import supply chains.

Table A.13 shows that the agriculture sector in Vietnam, as well as the agriculture and energy sectors in India, experienced growth in imports from Russia (and Belarus). Notably, Indian imports of mining and energy products from Russia (and Belarus) increased by 1400% between the pre-war and post-war periods.

4.2 Decomposing Trade Changes with Russia and Belarus

We decompose the change of a developing country's trade with Russia (and Belarus) into the following components: (1) firm entry/exit from trade, (2) trade partner entry/exit for continuing trading firms, (3) product entry/exit for continuing trading firm-partner relationship, and (4) continuing supply chains.

In line with Section 4.1, we use "trading firm" to refer to a developing country firm engaged in exports or imports with Russia (and Belarus). A Russian (or Belarusian) firm trading with the developing country firm is called a "trade partner", while a trading firm-partner-product relationship is referred to as a "supply chain". We define an entrant trading firm/trade partner/supply chain as one that appeared between Q1 2022 and Q3 2023 but did not exist between Q1 2021 and Q4 2021. An exited trading firm/trade partner/supply chain is one that was present between Q1 2021 and Q4 2021 but disappeared during Q1 2022 and Q3 2023. A continuing trading firm/trade partner/supply chain is one that appears in the data during both Q1 2021 to Q4 2021 and Q1 2022 to Q3 2023 periods.

The change of a country's total trade with Russia and Belarus, ΔX, can be decomposed into three components: changes in trade by continuing firms in the country, adding trade by firms who entered the Russian (or Belarusian) market after the war started, and subtracting trade by trading

firms that exited following the onset of the war:[31]

$$\Delta X = \sum_{i \in \text{Cont}} \Delta x_i + \sum_{i \in \text{Entry}} x_i - \sum_{i \in \text{Exit}} x_i \qquad (4.1)$$

The change in trade by a continuing firm can be broken down into changes with ongoing Russian (or Belarusian) trade partners, the addition of new trade partners, and the subtraction of trade from exited partners:

$$\Delta x_i = \sum_{j \in \text{Cont Partner}_i} \Delta x_{ij} + \sum_{j \in \text{Enter Partner}_i} x_{ij} - \sum_{j \in \text{Exit Partner}_i} x_{ij} \qquad (4.2)$$

The change in trade with a continuing partner can be further decomposed into changes within continuing products/supply chains, the addition of new products, and the subtraction of discontinued products:

$$\Delta x_{ij} = \sum_{p \in \text{Cont Supply Chain}_{ij}} \Delta x_{ijp} + \sum_{p \in \text{Enter Product}_{ij}} x_{ijp} - \sum_{p \in \text{Exit Product}_{ij}} x_{ijp} \qquad (4.3)$$

To calculate the contribution share of each component, we divide it by the total change in trade.

Observation 3. *The extensive margins, particularly firm entering and exiting trade and adding and dropping Russian (or Belarusian) trade partners, contributed the majority of developing country trade changes with Russia (and Belarus).*

Figure 2 shows that extensive margins, where firms enter and exit trade and add or drop Russian (or Belarusian) partners, substantially contributed to trade changes with Russia (and Belarus) for all developing countries.[32] As Section 4.1 indicates, war and subsequent sanctions greatly disrupted supply chains between Russia (and Belarus) and other developing countries, leading to high exits and turnovers of trade partners. Consequently, Table 7 shows that partner exit accounted for 80% and 137% of the export decrease from Mexico and Vietnam to Russia (and Belarus), and 191% of the import decrease in Vietnam from Russia (and Belarus). Trading firm exit also contributed 204% to the change in Mexican imports and 91% to the change in Vietnamese imports from Russia (and Belarus). In contrast, the intensive margin – trade changes within ongoing supply chains – had, at most, a moderate impact on total trade changes. This differs from findings by Bernard et al. (2009) and Flaaen et al. (2020), who report that in the US, during normal times and the COVID pandemic, the intensive margin – continuing supply chains – contributed most to the change in total trade. These patterns imply that conflict and sanctions disrupt supply chains to an extent unmatched by regular economic shocks or natural disasters.

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[31]Bernard et al. (2009) and Flaaen et al. (2023) use similar decomposition formulas.

[32]Tables A.14 - A.17 show that this pattern applies to all sectors.

Table 7: Decomposition of a Country's Total Trade Change with Russia and Belarus

Trading Firm Status	Partner Status	Product Status	Export			Import		
			Mexico	Vietnam	India	Mexico	Vietnam	India
Trading Firm Entry			-10.33%	-172.42%	816.63%	-115.24%	-47.72%	20.86%
Trading Firm Exit			11.02%	58.98%	-171.01%	203.97%	91.40%	-1.69%
Continuing Trading Firms			99.31%	213.44%	-545.62%	11.26%	56.32%	80.83%
Continuing Trading Firms	Partner Entry		-18.74%	-207.47%	1232.70%	-47.18%	-194.28%	91.50%
Continuing Trading Firms	Partner Exit		79.77%	136.84%	-1117.44%	23.66%	190.63%	-7.14%
Continuing Trading Firms	Continuing Partners		38.28%	284.07%	-660.88%	34.78%	59.97%	-3.53%
Continuing Trading Firms	Continuing Partners	Product Entry	-2.53%	-61.97%	260.59%	-10.63%	-10.65%	2.34%
Continuing Trading Firms	Continuing Partners	Product Exit	3.56%	51.24%	-505.63%	12.69%	16.69%	-0.60%
Continuing Trading Firms	Continuing Partners	Continuing Products	37.24%	294.80%	-415.84%	32.72%	53.93%	-5.28%

Notes: This table displays the various margins that contributed to India, Mexico, and Vietnam's trade changes with Russia (and Belarus). Based on Equations (4.1)-(4.3), a country's total trade change with Russia (and Belarus) is decomposed into contributions by (1) trading firm entry/exit, (2) trade partner entry/exit for continuing trading firms, (3) product entry/exit for continuing trading firm-partner relationship, and (4) continuing supply chains.

Figure 2: Contributions of Various Margins to Developing Countries' Trade with Russia and Belarus

(a) Export

(b) Import
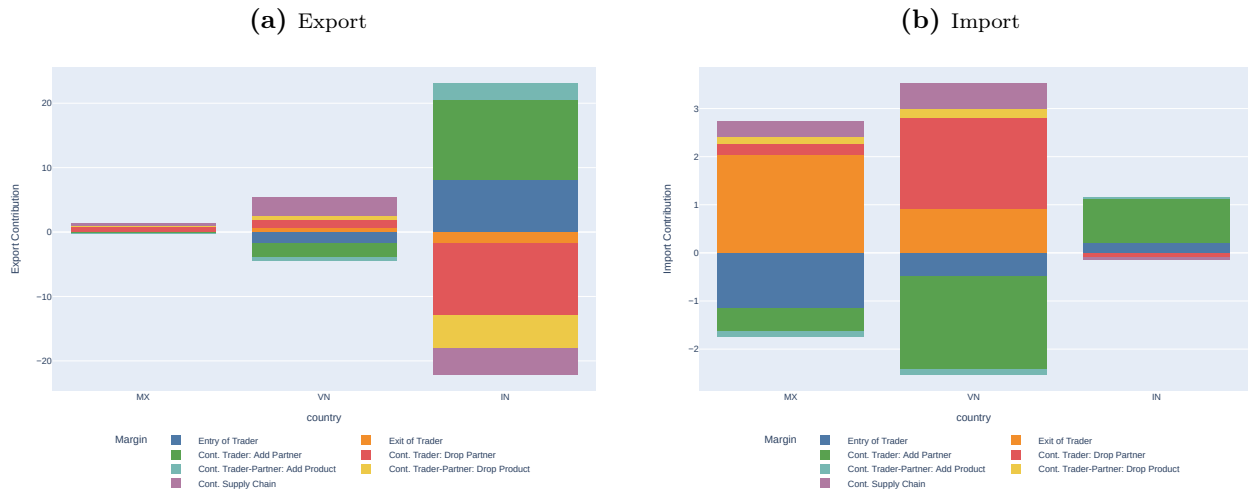
Notes: This figure displays the various margins that contributed to India, Mexico, and Vietnam's trade changes with Russia (and Belarus). A country's total trade change with Russia (and Belarus) is decomposed into contributions by (1) trading firm entry/exit, (2) trade partner entry/exit for continuing trading firms, (3) product entry/exit for continuing trading firm-partner relationship, and (4) continuing supply chains.

5   Trade with Russia and Belarus

We investigate the impact of export product sanctions on sanctioning MNEs, non-sanctioning MNEs, and domestic firms located in neutral developing countries. We conduct the analysis at multiple levels: product, firm-product, and supply chain.[33] The product-level analysis helps us understand the aggregate effects of sanctions. Firm-product level and supply chain level studies allow us to account for firm-time fixed effects to eliminate potentially confounding factors.

5.1   Product Level Exports

Our goal is to test if MNEs located in neutral developing countries and headquartered in sanctioning countries (sanctioning MNEs) comply with their headquarters' export product sanctions. To investigate the question at the product level, we aggregate the supply chain data for the three neutral developing countries at the MNE status m, product p, and quarter t levels. Since m represents either domestic firms, MNEs headquartered in sanctioning countries (sanctioning MNEs), or MNEs headquartered in non-sanctioning countries (non-sanctioning MNEs), we obtain total trade in product p with Russia by MNE status for the combined three countries.[34]

In our difference-in-differences analysis, we examine whether products subject to export product sanctions (first difference) experienced different changes in exports to Russia following the onset of the 2022 Russo-Ukrainian war (second difference). To identify the impact of MNE statuses (third difference), we construct a triple-differences estimation equation as follows:

$$y_{pmt} = \beta Post_t \times SanProd_p \times Multi_m + \gamma Post_t \times X_p \times Multi_m + \delta_{pt} + \delta_{mp} + \delta_{mt} + \epsilon_{pmt}. \qquad (5.1)$$

The left-hand side variable, y_{pmt}, represents the total exports of product p by all firms with MNE status m in the three neutral developing countries to Russia. In the baseline specification, we employ the inverse hyperbolic sine transformation of trade flows to study the aggregate sanctions impact. In Section 7.2, we separately investigate the intensive margin (with the log of trade flows as the dependent variable) and the extensive margin (using an indicator function that equals 1 for positive trade flows). On the right-hand side, $Post_t$ equals 1 if t is in or after the first quarter of 2022. $SanProd_p$ is 1 if product p appears on the export product sanction list. $Multi_m$ can denote sanctioning or non-sanctioning MNEs.

To account for potential correlations between other product characteristics and their inclusion on the export product sanction list, we control for alternative product features, summarized with X_p. For instance, we include capital and skill intensity to capture potential changes in the relationship

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[33]A supply chain is defined as a triple (firm, Russian/Belarusian firm, product).

[34]In the following subsection, we also explore regression specifications at the firm-product-quarter level and supply chain-quarter level. The qualitative conclusions derived from studies at more granular levels align with those obtained from the current product-time level regressions.

between trade and industry reliance on capital and skilled labor after the war. We also incorporate a dummy variable for advanced technology usage, as the US tended to target advanced technologies when sanctioning Russia and Belarus. This control aims to isolate the effect of sanctions from the role of advanced technology usage, using the advanced technology indicator from Pierce and Schott (2016).[35] Additionally, δ_{pt}, δ_{mp}, and δ_{mt} represent product-quarter, MNE status by product, and MNE status by time fixed effects, respectively. For instance, product-time fixed effects can control for structural changes within the Russian economy, including probable decreased demand for light manufacturing products and increased demand for heavy manufacturing products that serve as critical inputs for weapon production.

Alternatively, we study the impact of MNE statuses by applying the following difference-in-differences specification to each MNE status (subsample analysis):

$$y_{pmt} = \beta_m Post_t \times SanProd_p + \gamma_m Post_t \times X_p + \delta_{mp} + \delta_{mt} + \epsilon_{mpt},$$

$$m \in \{\text{Domestic}, \text{Sanctioning MNE}, \text{Non-sanctioning MNE}, \text{All}\}.$$
$$(5.2)$$

Note that in Equation 5.2 we are not able to control product-time effects effect as in Equation 5.1, whereas δ_{mp} and δ_{mt} refer to product and quarter fixed effects, respectively.

Table 8 presents the regression results from variations of Equation 5.1. Column 1 indicates that exports of sanctioned products to Russia (and Belarus) by MNEs experienced a more significant decline compared to domestic firms. Column 2 shows that exports by sanctioning MNEs decreased substantially more than those by non-sanctioning MNEs (captured by the coefficient before $Post_t \times \text{Multi Sanc}_i \times SP_p$), emphasizing that MNEs headquartered in sanctioning countries propagated their headquarters' export product sanctions to neutral countries. In Section 5.2, as we perform firm-product-time level regressions and are able to control firm-time fixed effects, the negative coefficient for non-sanctioning MNEs exporting sanctioned products vanishes, while the negative coefficient for sanctioning MNEs exporting sanctioned products remains significant.

Similarly, Columns 3, 4, and 5 show that sanctioning MNEs significantly reduced exports of sanctioned products to Russia (and Belarus) more than non-sanctioning MNEs. In Column 3, we remove the MNE status-time fixed effect and add interactions between the post-war time dummy and MNE statuses. These coefficients are not significant, indicating that MNEs (sanctioning or non-sanctioning) did not decrease exports to Russia more than domestic firms for an average product. Instead, sanctioning MNEs primarily reduced exports of the sanctioned products, confirming the export product sanction channel.

In Column 4, compared to Column 2, we remove product-quarter fixed effects, add interactions

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[35]To minimize clutter in regression tables, we do not report coefficients for interactions between alternative product characteristics and MNE statuses. The product characteristics controls for each column are specified in the table footnotes.

Table 8: Effects of Sanctions on Exports to Russia and Belarus (Triple Differences - Product Level)

	(1)	(2)	(3)	(4)	(5)
	IHS(Export to Russia-Belarus)				
$\text{Post}_t \times \text{Multi}_m \times \text{SP}_p$	-0.7335***	-0.4606***			
	(0.1603)	(0.1580)			
$\text{Post}_t \times \text{Multi Sanc}_m \times \text{SP}_p$		-0.5459***	-1.0065***	-1.0065***	-1.0065***
		(0.1181)	(0.1828)	(0.1828)	(0.1828)
$\text{Post}_t \times \text{Multi No-Sanc}_m \times \text{SP}_p$			-0.4606***	-0.4606***	-0.4606***
			(0.1579)	(0.1580)	(0.1580)
$\text{Post}_t \times \text{Multi Sanc}_m$			-0.5664		
			(0.6794)		
$\text{Post}_t \times \text{Multi No-Sanc}_m$			0.7628		
			(0.6266)		
$\text{Post}_t \times \text{Sanction Product}_p$				0.4787***	
				(0.1523)	
$\text{Post}_t \times \text{Skill Intensity}_p$				0.8426***	
				(0.2211)	
$\text{Post}_t \times \text{Capital Intensity}_p$				0.4066***	
				(0.0859)	
$\text{Post}_t \times \text{Advanced Technology}_p$				-0.0146	
				(0.1990)	
R^2	0.827	0.827	0.825	0.738	0.827
Product x MNEs Status FE	✓	✓	✓	✓	✓
MNEs Status x Quarter FE	✓	✓	-	✓	✓
Product x Quarter FE	✓	✓	✓	-	✓
Controls	✓	✓	✓	✓	✓
Observations	66330	66330	66330	66330	66330

Notes: Table reports the regression results of Equation (5.1) where the dependent variable is the value of exports of products p from India, Mexico, or Vietnam to Russia and Belarus. Column (1) controls for $Post_t \times X_p \times Multi_m$. Column (2) controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$. Column (3)-(5) control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Effects of Sanctions on Exports to Russia and Belarus (Product Level)

	(1)	(2)	(3)	(4)
	IHS(Export to Russia-Belarus)			
$\text{Post}_t \times \text{SP}_p$	-0.0103	0.4787***	-0.5278***	0.0181
	(0.0669)	(0.1523)	(0.1086)	(0.0506)
R^2	0.265	0.698	0.624	0.612
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	66330	22110	22110	22110

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Product level (p). *** p<0.01, ** p<0.05, * p<0.1.

between the post-war time dummy and whether product p is on the export product sanction list, and include additional product characteristics controls. The coefficient for the interaction between the post-war time dummy and whether product p is on the export product sanction list is positive and significant. This suggests that domestic firms in neutral developing countries increased exports of sanctioned products relative to non-sanctioned products, implying their non-compliance with Western export product sanctions. Remarkably, the coefficients in Columns 3 to 5 remain consistent.

In Column 1 of Table 9, the results from running Equation (5.2) pooling together domestic firms, sanctioning MNEs, and non-sanctioning MNEs indicate that the overall exports of sanctioned products to Russia (and Belarus) exhibited no significant difference compared to non-sanctioned products. However, this lack of noticeable change in total sanctioned product exports masks considerable heterogeneity across MNE statuses.

Columns 2, 3, and 4 of Table 9 present subsample regressions for domestic firms, sanctioning MNEs, and non-sanctioning MNEs. Consistent with compliance, exports of sanctioned products to Russia and Belarus by MNEs from sanctioning countries declined 53% more compared to non-sanctioned ones. In contrast, domestic firms in Vietnam, India, and Mexico increased their exports of sanctioned products to these countries by 48% (compared to non-sanctioned products), implying they were less likely to comply with US-led sanctions. Rather, as sanctioning MNEs had to comply

with their headquarters export product sanctions and reduced their exports of sanctioned products, domestic firms benefited from increased demand from Russia (and Belarus) and could expand their exports of these products. Exports by non-sanctioning MNEs, which might be more bound by sanctions than domestic firms but less so than sanctioning MNEs, exhibited no significant pattern.

Overall, the evidence supports the hypothesis that MNEs from sanctioning countries complied with extraterritorial export sanctions, while other firms, particularly domestic ones, exploited the situation by increasing their exports of sanctioned products to Russia and Belarus.

Event Study Figures To support our findings, we performed event studies that demonstrate parallel trends in trade for sanctioned and non-sanctioned products, domestic firms, non-sanctioning MNEs, and sanctioning MNEs before the war. To that end, we replace the post-war dummy in Equations 5.1 and 5.2 with quarter-specific dummies so that we analyze:

$$y_{pmt} = \sum_{k=2021q1}^{2023q3} \beta_k \mathbb{I}\{t=k\} \times SanProd_p \times Multi_m + \sum_{k=2021q1}^{2023q3} \gamma_k \mathbb{I}\{t=k\} \times X_p \times Multi_m + \delta_{pt} + \delta_{mp} + \delta_{mt} + \epsilon_{pmt},$$
(5.3)

to compare the performances of sanctioning MNEs to non-sanctioning MNEs and domestic firms, and

$$y_{mpt} = \sum_{k=2021q1}^{2023q3} \beta_{mk} \mathbb{I}\{t=k\} \times SanProd_p + \sum_{k=2021q1}^{2023q3} \gamma_{mk} \mathbb{I}\{t=k\} \times X_p + \delta_{mp} + \delta_{mt} + \epsilon_{mpt},$$

$$m \in \{\text{Domestic}, \text{Sanctioning MNE}, \text{Non-sanctioning MNE}, \text{All}\},$$
(5.4)

to study each MNE type separately.

Figure 3 shows the impact of sanctioning MNEs compared to non-sanctioning MNEs and corresponds to Column 2 of Table 8. After the war started, sanctioned product exports to Russia and Belarus by sanctioning MNEs declined significantly more than those by non-sanctioning MNEs, with no significant difference before the war.

Figure 4 compares the effects of sanctioning MNEs and non-sanctioning MNEs relative to domestic firms, corresponding to Column 5 of Table 8. After the war, exports of sanctioned products to Russia and Belarus by sanctioning MNEs decreased sharply more than those by domestic firms, with no significant difference before the war. A similar but less pronounced pattern is observed between non-sanctioning MNEs and domestic firms.

Figure 5 presents the estimates from Equation 5.4 for different MNE statuses. The figure highlights a striking difference in how firms with different MNE statuses reacted to the export product sanctions imposed on Russia and Belarus. Exports of sanctioned products to Russia and Belarus by sanctioning MNEs (sky blue) consistently declined after the war's onset but not before, while domestic firms (green) continually increased their exports. Non-sanctioning MNEs (blue) fell

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Figure 3: Effects of Sanctions on Exporting Sanctioned Products to Russia and Belarus: Sanc MNEs vs. Non-Sanc MNEs (Product Level)
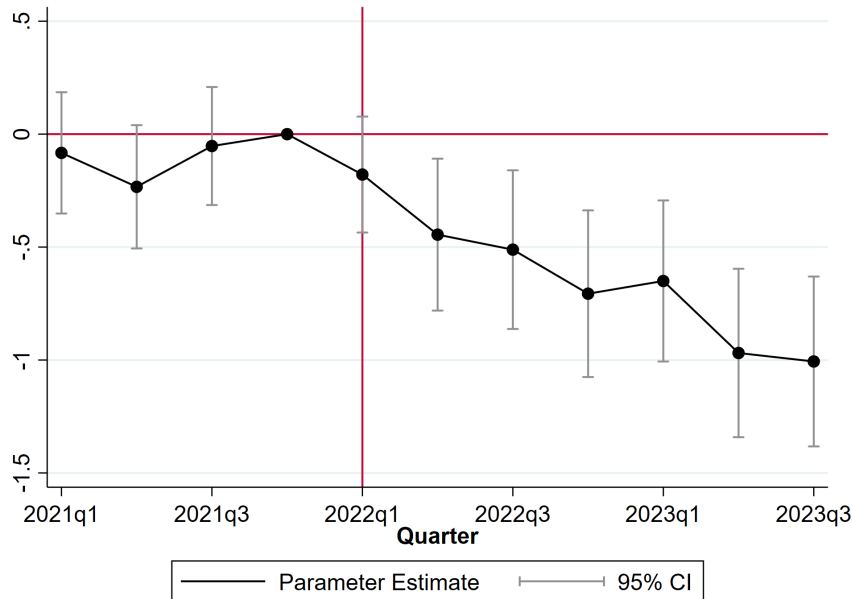
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.3). The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$, where X_p includes skill intensity, capital intensity, and advanced technology usage, are included. Standard errors are clustered at the product (p) level. The quarter prior to the war (2021q4) is the omitted reference quarter.

between the two, with minimal changes. These differential responses again underscore the mechanism of sanction propagation through global firms.

5.2 Firm-Product Level Exports

In this subsection, we conduct an analogous analysis at the firm-product level using the following specifications:

$$y_{ipt} = \beta Post_t \times SanProd_p \times Multi_i + \gamma Post_t \times X_p \times Multi_i + \delta_{pt} + \delta_{ip} + \delta_{it} + \epsilon_{ipt}. \qquad (5.5)$$

The dependent variable, y_{ipt}, denotes the value of exports (following the inverse hyperbolic transformation) to Russia and Belarus for firm i in product p in quarter t. On the right-hand side, $Multi_i$ indicates the MNE status of firm i (sanctioning MNE, non-sanctioning MNE, or domestic firm). We also include interactions between the post-war time dummy, product characteristics, and MNE status to account for the changing specialization patterns of MNEs compared to domestic firms in exporting products of different features. Moreover, we control for product-time, firm-product, and firm-time fixed effects.

We examine the sanction effects in different subsamples (sanctioning MNEs, non-sanctioning

Figure 4: Effects of Sanctions on Exporting Sanctioned Products to Russia and Belarus: Sanc MNEs vs. Dom and Non-Sanc MNEs vs. Dom (Product Level)
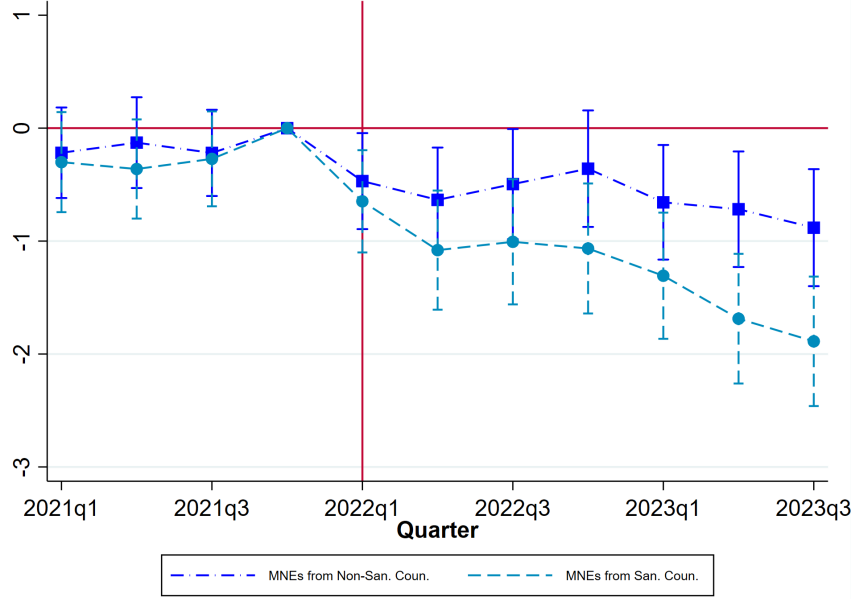
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.3). The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Controls for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$, where X_p includes skill intensity, capital intensity, and advanced technology usage, are included. Standard errors are clustered at the product (p) level. The quarter prior to the war (2021q4) is the omitted reference quarter.

MNEs, domestic firms, all firms) using the following specification:

$$y_{impt} = \beta_m Post_t \times SanProd_p + \gamma_m Post_t \times X_p + \delta_{imp} + \delta_{imt} + \epsilon_{impt},$$
$$i \in \Omega(m), m \in \{\text{Domestic, Sanctioning MNE, Non-sanctioning MNE, All}\}. \tag{5.6}$$

Furthermore, we implement the following event study specification on firm-product level to understand the dynamic effects of sanctioning MNEs relative to non-sanctioning MNEs or domestic firms in reducing sanctioned product exports:

$$y_{ipt} = \sum_{k=2021q1}^{2023q3} \beta_k \mathbb{I}\{t\text{=}k\} \times SanProd_p \times Multi_i + \sum_{k=2021q1}^{2023q3} \gamma_k \mathbb{I}\{t\text{=}k\} \times X_p \times Multi_i + \delta_{pt} + \delta_{ip} + \delta_{it} + \epsilon_{ipt} \tag{5.7}$$

Similar to Equation (5.4), we implement the following event study specification for each MNE

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Figure 5: Effects of Sanctions on Exporting Sanctioned Products to Russia and Belarus by MNE Status (Product Level)
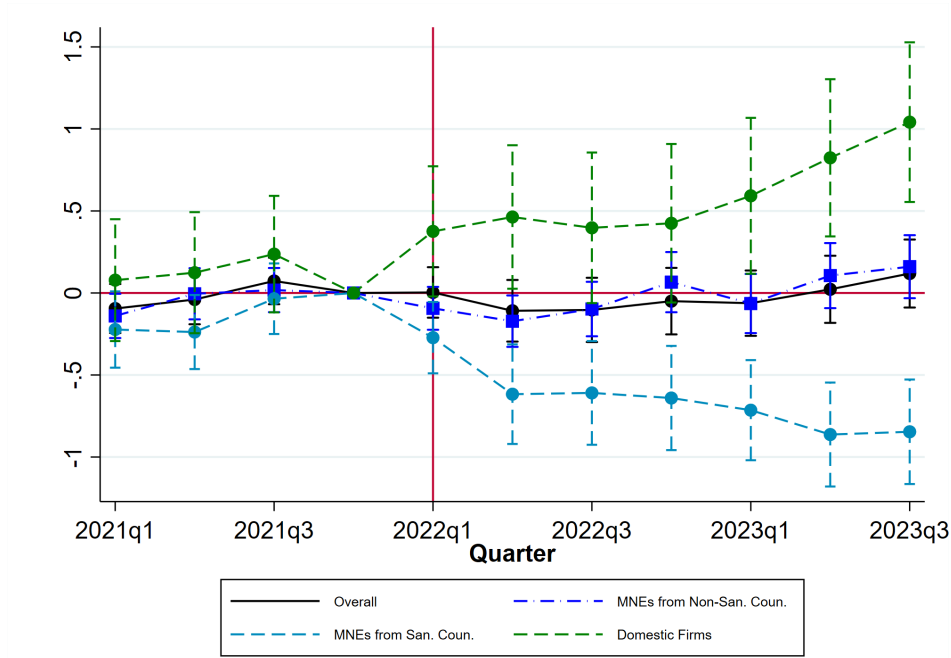
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.4) for each sample indicated by the legend. The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Standard errors are clustered at the product (p) level. The quarter prior to the war (2021q4) is the omitted reference quarter.

status:

$$y_{impt} = \sum_{k=2021q1}^{2023q3} \beta_{mk}\mathbb{I}\{t{=}k\} \times SanProd_p + \sum_{k=2021q1}^{2023q3} \gamma_{mk}\mathbb{I}\{t{=}k\} \times X_p + \delta_{imp} + \delta_{imt} + \epsilon_{impt},$$

$$i \in \Omega(m), m \in \{\text{Domestic, Sanctioning MNE, Non-sanctioning MNE, All}\}.$$

(5.8)

Table 10 shows the estimates of variations of Equation (5.5). Firm-product level analysis confirms that there is a significant relative declines in exports of products facing export sanctions among MNEs compared to domestic firms after the war (Column 1). Column 2 shows that non-sanctioning MNEs did not significantly reduce export of sanctioned products compared to domestic firms, but sanctioning MNEs strongly decreased exports of sanctioned products relative to non-sanctioning MNEs, a result further confirmed by Column 5. Compared to Column 2, Column 3 removes the firm-time fixed effect, adds country-time fixed effect, and includes interactions between the post-war time dummy and MNE statuses. This column confirms that sanctioning MNEs substantially reduced exports of products on the export sanction list, but not for an average product. Column 4 excludes product-time fixed effects and introduces the post-war time dummy interacting with whether product p faced export sanctions and various product features interacting with the time dummy. The significant

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and positive interaction between the post-war time dummy and export sanction product dummy indicates that domestic firms in neutral countries increased exports of sanctioned products relative to non-sanctioned products, thus not complying with Western sanctions. Moreover, the coefficients on $Post_t \times$ Multi $Sanc_i \times SP_p$ from Column 2 to 5 display consistency.

Figures 6 and 7 present the estimates for Equation 5.7. Figure 6 serves as the event study counterpart of Column 2 in Table 11, comparing sanctioning MNEs with non-sanctioning MNEs. Similarly, Figure 7 corresponds to the event study version of Column 5 in Table 11, comparing sanctioning MNEs with domestic firms (sky blue) and non-sanctioning MNEs with domestic firms (blue). Consistent with the product-level results, sanctioning MNEs significantly reduce their exports of sanctioned products to Russia and Belarus more than domestic firms and non-sanctioning MNEs.

In the subsample analysis, Table 11 presents the average treatment effect and Figure 8 presents the event study figures for each MNE status separately, based on Equation 5.7. Consistent with product-level findings, sanctioning MNEs exhibited the most pronounced decrease in exports of sanctioned products, while domestic firms adjust in the opposite direction. Overall, these findings highlight that MNEs transmit sanctions from their headquarters countries to their subsidiary countries, impacting trade in their host countries. Meanwhile, domestic firms in neutral developing countries capitalize on sanctions by expanding exports of sanctioned products to Russia and Belarus, filling the market gaps left by sanction compliers.

Figure 6: Effects of Sanctions on Exports to Russia and Belarus: Sanc MNEs vs. Non-Sanc MNEs (Firm-Product Level)
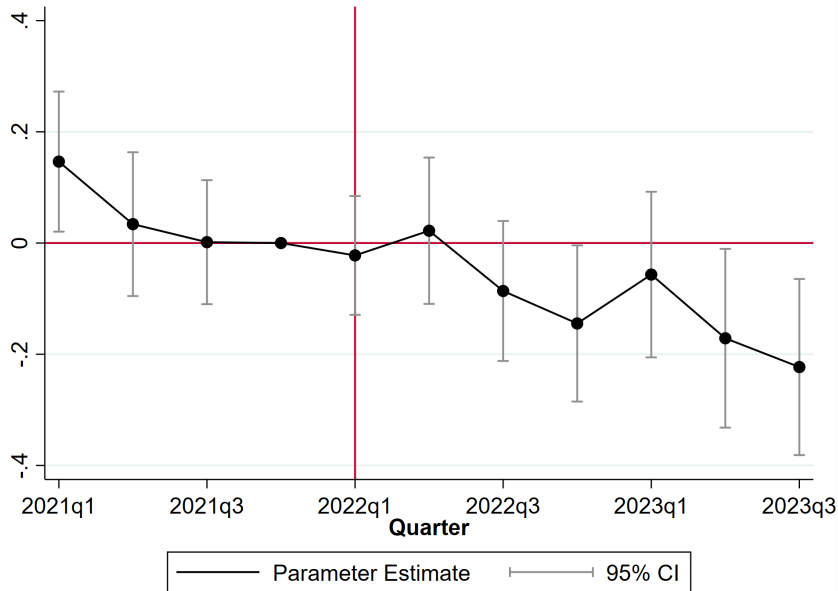
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.7). The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$, where X_p includes skill intensity, capital intensity, and advanced technology usage, are included. Standard errors are clustered at the firm-product $(i - p)$ level. The quarter prior to the war (2021q4) is the omitted reference quarter.

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Table 10: Effects of Sanctions on Exports to Russia and Belarus (DDD - Firm-Product Level)

	(1)	(2)	(3)	(4)	(5)
	IHS(Export to Russia-Belarus)				
$\text{Post}_t \times \text{Multi}_i \times \text{SP}_p$	-0.1041***	0.0217			
	(0.0200)	(0.0448)			
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{SP}_p$		-0.1429***	-0.1564***	-0.1216***	-0.1212***
		(0.0476)	(0.0218)	(0.0210)	(0.0213)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{SP}_p$			0.0024	0.0273	0.0217
			(0.0521)	(0.0447)	(0.0448)
$\text{Post}_t \times \text{Multi Sanc}_i$			0.1834**		
			(0.0888)		
$\text{Post}_t \times \text{Multi No-Sanc}_i$			-0.1737		
			(0.2580)		
$\text{Post}_t \times \text{SP}_p$				0.0290***	
				(0.0088)	
$\text{Post}_t \times \text{Capital Intensity}_p$				0.0050	
				(0.0060)	
$\text{Post}_t \times \text{Skill Intensity}_p$				0.0378***	
				(0.0143)	
$\text{Post}_t \times \text{Advanced Technology}_p$				-0.0062	
				(0.0119)	
R^2	0.617	0.617	0.515	0.608	0.617
Firm x Product FE	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	-	✓	✓
Country x Quarter FE	-	-	✓	-	-
Product x Quarter FE	✓	✓	✓	-	✓
Controls	✓	✓	✓	✓	✓
Observations	1152745	1152745	1165824	1153218	1152745

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Firm x Quarter controls absorb $\text{Post}_t \times \text{Multi}_i$ and $\text{Post}_t \times \text{Multi Sanction}_i$. Column (1) controls for $Post \times X_p \times Multi_m$. Column (2) controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$. Column (3)-(5) control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table 11: Effects of Sanctions on Exports to Russia and Belarus (Firm - Product Level)

	(1)	(2)	(3)	(4)
	IHS(Export to Russia-Belarus)			
$\text{Post}_t \times \text{SP}_p$	0.0061	0.0290***	-0.0927***	0.0563
	(0.0079)	(0.0088)	(0.0188)	(0.0435)
R^2	0.608	0.612	0.560	0.647
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	1153218	929874	197571	25773

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i - p)$. *** p<0.01, ** p<0.05, * p<0.1.

5.3 Imports from Russia and Belarus

In this section, we investigate whether firms in neutral developing countries decreased imports of sanctioned products from Russia. Due to export sanctions, Russian and Belarusian firms would likely retain a larger share of sanctioned products they produced for domestic use, resulting in fewer exports to neutral countries. Consequently, firms in neutral countries might import fewer sanctioned products from Russia. Since sanctioning MNEs were not subject to extraterritorial product sanctions on imports, their import adjustment patterns should remain ambiguous compared to domestic firms and non-sanctioning multinationals.

Table 12 shows that imports of sanctioned products from Russia and Belarus to Vietnam, India, and Mexico have significantly decreased by 23% compared to non-sanctioned products. This analysis is based on empirical specification (5.2), where we replace the left-hand side variable with the total imports (using inverse hyperbolic sine transformation) by developing country firms of MNE status m in product p and quarter t. This decline is observed across all firm types and is more pronounced for domestic firms. Figure 9 shows that this pattern emerged right after the war's onset and not before. At the firm-product level, Table B.1 and Figure B.1 display similar import suppression effects of export sanctions. Domestic firms in developing countries reduce their imports of sanctioned products from Russia more than both types of MNEs.

Figure 7: Effects of Sanctions on Exports to Russia and Belarus: Sanc MNEs vs. Dom and Non-Sanc MNEs vs. Dom (Firm-Product Level)
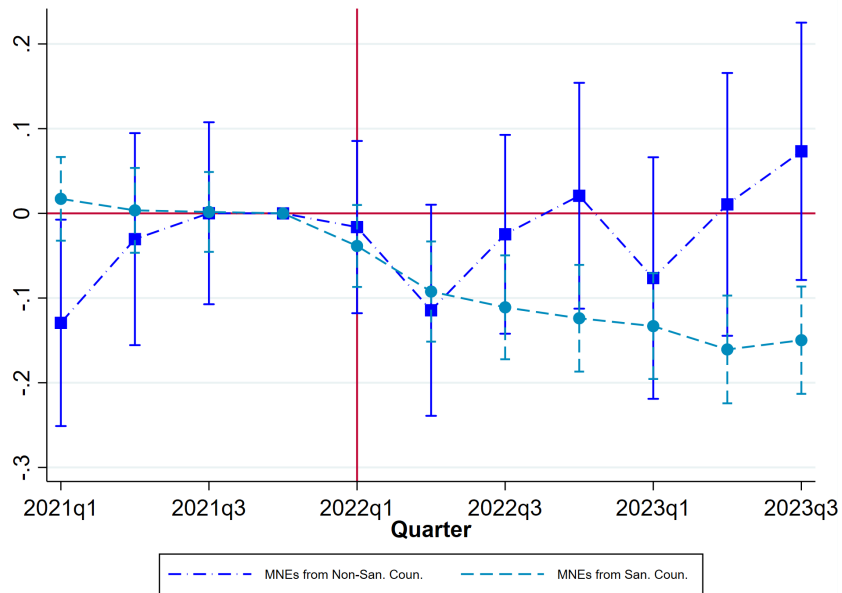
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.7). The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Controls for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$, where X_p includes skill intensity, capital intensity, and advanced technology usage, are included. Standard errors are clustered at the firm-product $(i - p)$ level. The quarter prior to the war (2021q4) is the omitted reference quarter.

Figure 8: Effects of Sanctions on Exports to Russia and Belarus (Firm - Product Level)
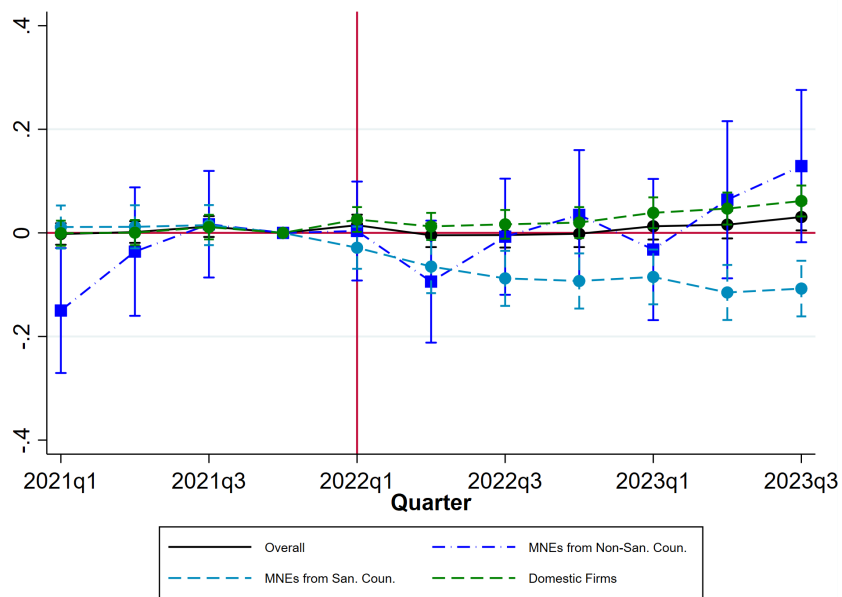
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.8) for each sample indicated by the legend. The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Standard errors are clustered at the firm-product (ip) level. The quarter prior to the war (2021q4) is the omitted reference quarter.

Table 12: Effects of Sanctions on Imports from Russia and Belarus (Product Level)

	(1)	(2)	(3)	(4)
	IHS(Import from Russia-Belarus)			
Post$_t$×SP$_p$	-0.2337***	-0.3189***	-0.2795***	-0.1028**
	(0.0531)	(0.1148)	(0.0818)	(0.0484)
R^2	0.291	0.630	0.537	0.432
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	65769	21923	21923	21923

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam from Russia and Belarus. Controls include Post$_t$×Capital Intensity$_p$, Post$_t$×Skill Intensity$_p$, and Post$_t$×Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the Product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Figure 9: Effects of Sanctions on Imports from Russia and Belarus (Product Level)
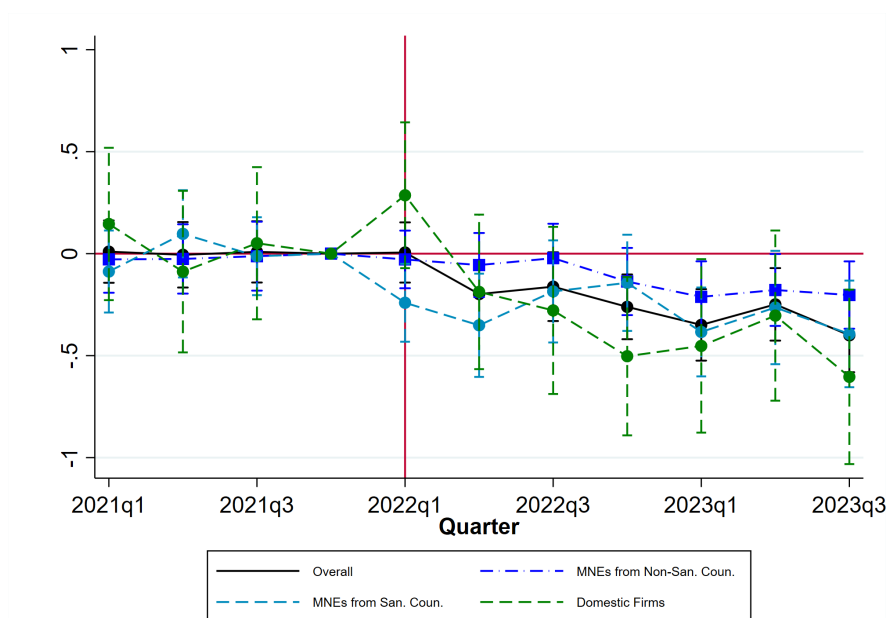
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.4) for each sample indicated by the legend. The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Standard errors are clustered at the product (p) level. The quarter prior to the war (2021q4) is the omitted reference quarter.

6 Trade with Countries Other Than Russia and Belarus

We investigate the extent to which sanctioning MNEs, non-sanctioning MNEs, and domestic firms in neutral developing countries diverted their trade to non-Russian (and non-Belarusian) countries in response to export product sanctions. In particular, we seek to understand the underlying motivations for sanctioning MNEs in their trade diversion efforts. If we observe a significant trade diversion to sanctioning countries, it may indicate that their primary motivation was to find alternative markets, as sales to these countries would be unlikely to be redirected to Russia ultimately. On the other hand, if we observe a substantial trade diversion to Russia-friendly countries, it may suggest that sanctioning MNEs are using these countries as a platform to continue serving the Russian market, thereby avoiding the sanctions.

In line with Section 2, we hypothesize that countries potentially serving as indirect export platforms to Russia include non-sanctioning countries that use Russia's System for Transfer of Financial Messages (SPFS), such as Armenia, Cuba, India, Iran, Kazakhstan, and Kyrgyzstan. Additional Russia-friendly countries are members of the Commonwealth of Independent States (CIS), which include Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, and Uzbekistan. Lastly, we consider the remaining non-sanctioning countries that share borders with Russia or Belarus, such as China.

Sanctioning MNEs increased their exports of sanctioned products to both SPFS and CIS countries. The trade diversion patterns are reported in Tables 13 (product-level) and 14 (firm-product level).[36] Panel A studies exports to both SPFS and CIS countries, Panel B focuses on SPFS members, and Panel C focuses on CIS members. In Panels A to C, the coefficients for the interaction between the post-war time dummy and the dummy indicating whether product p faced export sanctions are positive and significant for sanctioning MNEs. This suggests that, compared to non-sanctioned products, sanctioning MNEs substantially increased exports of sanctioned products to Russia-friendly countries. Given that sanctioning MNEs were more restricted from exporting sanctioned products to Russia, this pattern aligns with the motive of these MNEs seeking to avoid sanctions while adjusting trade. In contrast, domestic firms and non-sanctioning MNEs did not strongly increase their exports of sanctioned products to SPFS and CIS countries. As they faced fewer restrictions when exporting sanctioned products to Russia directly, they had limited incentives to redirect trade through Russia-friendly countries. This finding is further supported by event study Figure 10, which shows that, compared to domestic firms, sanctioning MNEs experienced a more significant increase in exports of sanctioned products to SPFS and CIS countries than their non-sanctioning counterparts.[37]

Panel D focuses on China. Unlike SPFS and CIS countries, exports of sanctioned products to

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[36]The regression specification we estimate is Equations (5.2) (5.6), where the regressor constitutes the inverse hyperbolic sine of product-level or firm-product level trade flows to other countries.

[37]We estimate a variant of Equation (5.3), where we replace the left hand side variable with the inverse hyperbolic sine of product-level or firm-product level trade flows to other countries.

China did not grow significantly among sanctioning MNEs but increased mainly for non-sanctioning MNEs and domestic firms in developing countries. One possible explanation could be that numerous Chinese firms were already supplying sanctioned products to Russia, making the Chinese market more competitive and less profitable for sanctioning MNEs compared to exporting to Russia via SPFS and CIS countries. Another possibility is multi-step indirect exporting to Russia through Hong Kong headquartered MNEs or developing country domestic firms. In an unreported regression, most non-sanctioning MNEs that increased exports of sanctioned products to China were headquartered in Hong Kong. Sanctioning MNEs may have sold sanctioned products to Hong Kong affiliates in developing countries or these countries' domestic firms, who then resold the products to China and subsequently to Russia. This strategy might reduce the likelihood of being detected by sanctioning country authorities.

Panel E shows that sanctioning MNEs significantly increased exports of sanctioned products to sanctioning countries, suggesting a genuine effort to switch to new customers. This result, in conjunction with Panels A-C, implies that sanctioning MNEs redirected their exports away from Russia and Belarus due to a combination of sanction compliance and avoidance motivations.

Columns 2 and 4 of Table 14 show that domestic firms in developing countries and MNEs from non-sanctioning countries significantly increased exports of sanctioned products to China, sanctioning countries, and all non-Russian and non-Belarusian countries. This can be attributed to economies of scale and learning-by-doing. By capitalizing on the Russian market opportunities left by sanction-compliant firms, they gained experience in producing sanctioned products and became more efficient, which likely contributed to the growth of their exports of these products to all destinations.

Table 13: Effects of Sanctions on Exports Diversion (Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Export to SPFS + CIS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.1221***	0.1129	0.2290***	0.0243
	(0.0449)	(0.1084)	(0.0667)	(0.0265)
R^2	0.302	0.663	0.708	0.681
Panel B. DV: IHS(Export to SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.1108***	0.1387	0.1703***	0.0236
	(0.0423)	(0.1037)	(0.0616)	(0.0250)
R^2	0.295	0.640	0.713	0.690
Panel C. DV: IHS(Export to CIS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0409	-0.0081	0.1537***	-0.0228
	(0.0368)	(0.0930)	(0.0539)	(0.0199)
R^2	0.277	0.631	0.607	0.583
Panel D. DV: IHS(Export to China)				
$\text{Post}_t \times \text{SP}_p$	0.1228**	0.2281*	-0.0175	0.1577***
	(0.0576)	(0.1242)	(0.0887)	(0.0566)
R^2	0.365	0.775	0.791	0.676
Panel E. DV: IHS(Export to Sanctioning Countries)				
$\text{Post}_t \times \text{SP}_p$	0.1248	-0.0494	0.1910*	0.2327***
	(0.0810)	(0.1473)	(0.1153)	(0.0857)
R^2	0.341	0.823	0.867	0.816
Panel F. DV: IHS(Export to Countries other than Russia-Belarus)				
$\text{Post}_t \times \text{SP}_p$	0.1473	0.0329	0.1410	0.2681***
	(0.0919)	(0.1530)	(0.1217)	(0.1017)
R^2	0.326	0.777	0.874	0.820
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	66330	22110	22110	22110

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to countries other than Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table 14: Effects of Sanctions on Exports Diversion (Firm-Product Level)

	(1)	(2)	(3)	(4)
	IHS(Export to Countries other than Russia-Belarus)			
Panel A. DV: IHS(Export to SPFS + CIS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0166***	0.0092**	0.0438***	0.0265
	(0.0043)	(0.0046)	(0.0117)	(0.0255)
R^2	0.594	0.585	0.613	0.702
Panel B. DV: IHS(Export to SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0138***	0.0069*	0.0399***	0.0238
	(0.0038)	(0.0039)	(0.0107)	(0.0239)
R^2	0.593	0.576	0.630	0.708
Panel C. DV: IHS(Export to CIS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0075**	0.0066*	0.0116*	-0.0049
	(0.0032)	(0.0037)	(0.0065)	(0.0155)
R^2	0.574	0.578	0.539	0.650
Panel D. DV: IHS(Export to China)				
$\text{Post}_t \times \text{SP}_p$	0.0233***	0.0241***	0.0021	0.1599**
	(0.0065)	(0.0065)	(0.0192)	(0.0635)
R^2	0.665	0.665	0.666	0.631
Panel E. DV: IHS(Export to Sanctioning Countries)				
$\text{Post}_t \times \text{SP}_p$	0.1160***	0.1182***	0.0989***	0.2109**
	(0.0158)	(0.0177)	(0.0375)	(0.1023)
R^2	0.742	0.742	0.733	0.760
Panel F. DV: IHS(Export to Countries other than Russia-Belarus)				
$\text{Post}_t \times \text{SP}_p$	0.1950***	0.1983***	0.1635***	0.3755***
	(0.0205)	(0.0232)	(0.0458)	(0.1327)
R^2	0.687	0.681	0.705	0.711
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	1153218	929874	197571	25773

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to countries other than Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm-Product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Figure 10: Effects of Sanctions on Exports to CIS + SPFS Countries (Product Level)
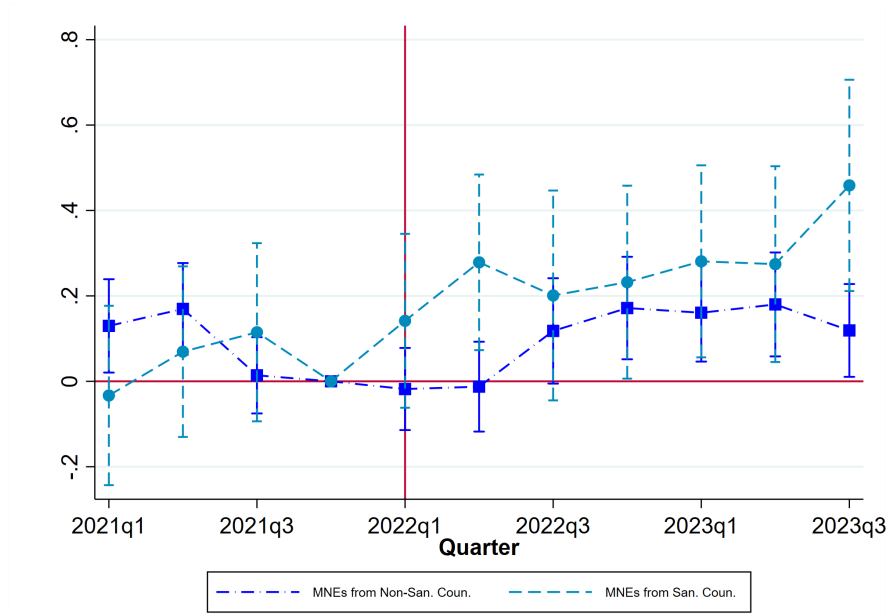
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.4) for each sample indicated by the legend. The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Standard errors are clustered at the product (p) level. The quarter prior to the war (2021q4) is the omitted reference quarter.

7 Extensions

7.1 Firm x Russian/Belarusian Firm x Product (Supply Chain) Level Analysis

In this subsection, we conduct the analysis at the supply chain level. Here, a supply chain is defined as a triple (i, j, p) where i, j, and p refer to a firm in Vietnam, India, and Mexico (i), a Russian or Belarusian firm (j), and product (p), respectively. To investigate the differences between sanctioning MNEs and non-sanctioning MNEs/domestic firms in reducing exports of sanctioned products to Russia, we employ the following regression specification:

$$y_{ijpt} = \beta Post_t \times SanProd_p \times Multi_i + \gamma Post_t \times X_p \times Multi_i + \delta_{pt} + \delta_{ijp} + \delta_{it} + \delta_{jt} + \epsilon_{ijpt}. \quad (7.1)$$

y_{ijpt} denotes trade flow between firm i and firm j in product p, quarter t. On the right hand side, product-time, supply, and firm-time fixed effects are controlled.

We can also conduct subsample analysis using the following specification:

$$y_{ijpmt} = \beta_m Post_t \times SanProd_p + \gamma_m Post_t \times X_p + \delta_{ijmp} + \delta_{imt} + \delta_{jmt} + \epsilon_{ijmpt},$$

$$i \in \Omega(m), m \in \{\text{Domestic}, \text{Sanctioning MNE}, \text{Non-sanctioning MNE}, \text{All}\}. \quad (7.2)$$

The results are consistent with the product-level and firm-product level analysis presented in

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previous sections. Table B.4 shows a decline in exports by sanctioning MNEs and an increase in those by domestic firms in the sanctioned products. Table B.5 displays a weak decline in imports from Russia and Belarus. These patterns are further corroborated by Tables B.6 and B.7 which employ Equation 7.2.

7.2 Extensive and Intensive Margin Adjustment

In this section, we separately examine the extensive and intensive margins. For the extensive margin, we perform analogous regressions with the dependent variable being an indicator of trading a non-zero amount. The results are reported in Tables B.10 to B.13. For the intensive margin, we use the log trade value as the dependent variable, where we drop zero trade observations. The outcomes are presented in Tables B.14 to B.17.

Overall, we find that the extensive margin dominates the aggregate outcome although intensive margin adjustment also points to the same direction, a pattern consistent with Section 4.2 which shows that the extensive margin is more important in driving developing countries' trade changes with Russia from pre-war to post-war periods. When we analyze the extensive margin adjustment, the main qualitative patterns are maintained: the likelihood of engaging in exporting sanctioned products to Russia and Belarus decreased for sanctioning MNEs but increased for domestic firms. The likelihood of engaging in imports of sanctioned products from Russia and Belarus declined for any type of firms. This is true whether the analysis is conducted at product level (Tables B.10 for exports and B.11 for imports) or at firm-product level (Tables B.12 for exports and B.13 for imports). The intensive margin adjustment weakly points to the same direction. The increase in exports to Russia and Belarus among domestic firms is observed at product level, but not at firm-product level. The declines in imports from Russia and Belarus are observed for sanctioning MNEs only at product-level, but are not obvious at firm-product level.

7.3 Controlling Additional Product Characteristics

We obtain reassuringly consistent results as we control for additional product characteristics, including pre-war total product-level or firm-product-level trade value, contract intensity, external finance dependence, asset tangibility, trade credit intensity, and inventory ratio. Our findings show that exports to Russia and Belarus have experienced a more substantial decline for sanctioning MNEs than domestic firms and non-sanctioning MNEs, regardless of whether the analysis is conducted at the product level (Table B.18), firm-product level (Table B.20), or supply chain level (Table B.22). For imports, the differential response by multinational statuses was ambiguous in our baseline results, and the pattern continues to be unclear in Tables B.19, B.21, and B.23. This observation supports the institutional arrangement: Extraterritorial product sanctions are imposed on exports but not on imports.

7.4 Controlling Additional Headquarters Country Characteristics: Trade Shares, Stage of Development, and Financial Stability

Our baseline findings remain robust when accounting for various other headquarters country characteristics. For example, the observed patterns could be attributed to the economic development stage of the headquarters countries rather than their status as sanctioning countries. To address this concern, we control for whether the headquarters countries are advanced economies and whether they have above-median GDP per capita among all headquarters countries.

Moreover, a firm's trade reliance on sanctioning countries could be an additional channel through which sanctions affect multinationals. Firms importing a larger share of inputs from sanctioning countries may be more likely to use technologies from these countries, making them more susceptible to export product sanctions. On the other hand, firms exporting a greater share to sanctioning countries would face a larger loss in sales if they were banned from those markets, increasing their motivation to comply with export sanctions. To account for this, we include controls for a firm's export or import shares with sanctioning countries in our analysis. Table B.24 incorporates these controls and reaffirms our finding from Table 10: sanctioning MNEs exhibit a sharper decline in exports of sanctioned products to Russia and Belarus compared to domestic firms and non-sanctioning MNEs.

Finally, considering the involvement of financial sanctions following the war, the financial stability of sanctioning countries might also influence the effectiveness of sanctions. To account for this, we include controls for the headquarters countries' liquidity liabilities to GDP ratio, central bank assets to GDP ratio, and deposit money bank assets to GDP ratio. Table B.26 presents the results with these additional controls, reaffirming the robustness of our main findings from Table 10.

7.5 Analysis for Mexico, Vietnam, and India Individually

In this section we present empirical results based on each country – Mexico, Vietnam, and India – separately. The goal is to test whether our findings are commonly found across all three countries or if they are being driven by a country with peculiar pattern.

We find that the patterns observed in individual countries are generally in line with the findings from the pooled analysis. Panel A of Tables B.28 - B.33 find that exports to Russia and Belarus increased (declined) for domestic firms (sanctioning MNEs) albeit statistically insignificant for some countries, consistent with the overall pattern we observed in Tables 8 and 9. Panel B of these tables find that exports of sanctioned products to SPFS and CIS countries increased in India and Vietnam whereas Mexico did not display a significant pattern. This could be because India and Vietnam are not geographically adjacent to any sanctioning country so that they can more easily divert trade to avoid sanctions.

The patterns observed in individual countries are generally consistent with the findings from the pooled analysis. Panel A of Tables B.28 - B.33 shows that exports to Russia and Belarus increased for domestic firms and declined for sanctioning MNEs (albeit statistically insignificant for some countries), which is consistent with the overall pattern observed in Tables 8 and 9. Panel B of these tables shows that exports of sanctioned products to SPFS and CIS countries increased in India and Vietnam, while Mexico did not exhibit a significant pattern. This may be attributed to the fact that India and Vietnam are not geographically adjacent to any sanctioning country, making sanctioning MNEs located there easier to divert trade and avoid sanctions.

Furthermore, Panel A of Tables B.34 - B.39 demonstrates that imports of sanctioned products from Russia and Belarus generally decreased for all three countries (particularly for Vietnam and India) and for all MNE statuses. This pattern is in line with the overall pattern observed in Table 12.

8 Financial Risks

After demonstrating that export product sanctions serve as a crucial policy tool through which sanctioning MNEs comply with sanctions and decrease their exports to Russia and Belarus, in this section we would like to explore: What policies could potentially reduce the import of sanctioning MNEs from Russia (and Belarus)? Could financial sanctions help?

Financial sanctions, such as banning numerous Russian banks from SWIFT, increased risks in the Russian economy, particularly for sectors dependent on external financing and trade finance. MNEs, with advanced sourcing capabilities, could be better at finding an alternative foreign input provider and reducing imports from Russia, especially in financially riskier sectors. Compared to domestic firms and non-sanctioning MNEs in developing countries, sanctioning MNEs were also less likely to receive financing from their headquarters' banks for trade with Russia. This led to additional costs associated with importing from Russia and further reduced their trade with the country.

Our empirical strategy follows Manova et al. (2015). We collect ISIC 4-digit level external finance dependence, (the negative of) asset tangibility, (the negative of) trade credit intensity, and inventory ratio.[38] To derive a single index of sectoral financial risk ($Fin\ Risk_p$), we compute the first principal component of the four financial risk measures, ($FPC4_p$). Furthermore, we calculate the mean of the standardized financial risk measures, ($AVG4_p$), which serves as a robustness test.

To generate firm-sector level variations, we interact the sectoral financial risk index with whether firm i is a sanctioning MNE ($MultiSan_i$) or a non-sanctioning MNE ($Multi\ No-San_i$). Additionally, we interact the sectoral financial risk index with firm-level financial health measures, such as the firm's financial profit rate, liquidity ratio, leverage ratio, and firm age, all measured using the average

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[38]We take the negative of asset tangibility and trade credit intensity to ensure that a higher index value represents greater financial risk.

value during the pre-war period.[39]

Our regression equation is the following:

$$
\begin{aligned}
y_{ipt} = {} & \beta^1 Post_t \times Fin\ Risk_p \times Multi\ San_i + \beta^2 Post_t \times Fin\ Risk_p \times Multi\ No\text{-}San_i \\
& + \gamma Post_t \times Fin\ Risk_p \times Firm\ Fin\ Health_i + \lambda Post_t \times Trade_{ip,pre}^{World} + \delta_{pt} + \delta_{ip} + \delta_{it} + \epsilon_{ipt}.
\end{aligned}
\tag{8.1}
$$

y_{ipt} denotes import or export with Russia (and Belarus) by firm i in product p time t. On the right-hand side, in addition to the interactions between the post-war time dummy, sectoral financial risk index, and firm-level multinational indicators/financial health, we include product-time, firm-product, and firm-time fixed effects. Furthermore, we control for the effect of firm size, measured by the firm's total imports or exports in product p during the pre-war period.

Table 15 shows that sanctioning MNEs reduced their imports from Russia (and Belarus) more in financially riskier industries. Column 1 includes only the effects of multinational status without accounting for the effects of firm financial health. Column 2 incorporates these effects. Column 3, in addition to Column 2, removes the product-time fixed effect but includes interactions between the post-war time dummy and sectoral financial risk, as well as between the post-war time dummy and whether product p is on the export product sanctions list.

While firms with better financial health were more likely to remain in the Russian (and Belarusian) market, conditional on these firm financial characteristics, sanctioning MNEs tended to reallocate their input sourcing away from Russia (and Belarus). Columns 2 and 3 suggest that firms with better financial health (higher profit rate, more liquid assets, lower leverage, and more mature) demonstrated greater resilience to financial risks and reduced their imports from Russia (and Belarus) to a lesser extent.[40] By comparing the coefficients on the effect of sanctioning MNE status in Columns 2-3 with Column 1, it appears that sanctioning MNEs, compared to domestic firms, were more financially healthy. Consequently, the effect of sanctioning MNE status was amplified when other firm financial characteristics were controlled for.

As a robustness test, we use the mean of standardized financial risk measures, $(AVG4_p)$, as a measure of sectoral financial risks in Table B.40. The observed pattern – sanctioning MNEs reducing trade with Russia (and Belarus) in financially riskier sectors, conditional on firm financial health – remains robust. In Tables B.41 and B.42, we study the effects of multinational status and firm financial health on exports to Russia (and Belarus) but find no significant effects of a firm being

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[39]A firm's financial profit rate is defined as the ratio of financial profit to the firm's financial expenditure. The liquidity ratio is calculated as the difference between the firm's current assets and stocks, divided by the firm's current liabilities. The leverage ratio is calculated as the sum of the firm's non-current liabilities and loans, divided by the firm's shareholder funds. Firm age is measured by the number of years the firm has been continuously operating in the Russian/Belarusian market.

[40]These effects are consistent with findings in Chor and Manova (2012), Schmidt-Eisenlohr (2013), Antras and Foley (2015), Niepmann and Schmidt-Eisenlohr (2017), Monarch and Schmidt-Eisenlohr (2023), among others, who have shown that older and more financially sound supply chains are more resilient to shocks.

a sanctioning MNE. This result suggests that export product sanctions are the dominant policy regulating sanctioning MNEs' exports.

9   Conclusion

We investigate the transmission of export product sanctions through MNEs and the reduction of imports from Russia (and Belarus) by sanctioning MNEs in financially riskier sectors. These novel sanction propagation mechanisms may prompt neutral developing countries to adhere to Western sanctions. We examine the context of the Russo-Ukrainian War, one of the most significant military conflicts in recent history. We employ detailed transaction-level export and import data from major developing economies (India, Mexico, and Vietnam) sourced from S&P bill of lading database, as well as firm-level balance sheet information from Orbis. This enables us to analyze trade adjustments on various levels of aggregation.

We find that sanctioning MNEs strongly decreased exports of sanctioned products to Russia (and Belarus), which coincided with an increase in exports of these products to both sanctioning and Russia-friendly countries. This suggests a combination of sanction compliance and avoidance. Domestic firms significantly increased their exports of sanctioned products to both Russia (and Belarus) and sanctioning countries but not more to Russia-friendly countries, indicating that these firms are avoiding sanctions and benefiting from economies of scale. Neutral developing country domestic firms reduced their imports of sanctioned products, but MNEs did not.

Furthermore, sanctioning MNEs reduced their imports from Russia (and Belarus) more in financially riskier sectors compared to firms with similar financial performances, while financially healthier firms reduced their imports from Russia (and Belarus) less in these sectors. This implies that sanctioning MNEs, with better sourcing capabilities and a lower likelihood of obtaining financing for their Russian (and Belarusian) trade from headquarters banks, reallocated their input sourcing further away from Russia (and Belarus), in particular in financially risky sectors. Furthermore, financial sanctions did not significantly impact neutral developing country firms' exports, with export product sanctions being the most significant channel.

We argue that effective sanctions should mobilize MNEs in neutral developing countries, as they have incentives to comply with export sanctions and are more sensitive to financial sanctions in import responses. Neutral developing countries may distance themselves from Western sanctions; however, Western multinationals, due to their significant role in the host countries' supply chains, can potentially enhance developing countries' compliance with Western sanctions. Future success of sanctions relies on discouraging domestic firms in neutral countries from trading with sanctioned nations. If sanctioning countries aim to further isolate Russia (and Belarus) from trade, they should also encourage additional policy measures that incentivize sanctioning MNEs to decrease their imports

Table 15: Effects on Import from Russia and Belarus: Financial Risks

	(1)	(2)	(3)
	IHS(Import from Russia-Belarus)		
$\text{Post}_t \times \text{Multinational Sanc}_i \times \text{FPC4}_p$	-0.0058**	-0.0075***	-0.0104***
	(0.0025)	(0.0026)	(0.0030)
$\text{Post}_t \times \text{Multinational No-Sanc}_i \times \text{FPC4}_p$	0.0084	0.0070	0.0055
	(0.0095)	(0.0094)	(0.0102)
$\text{Post}_t \times \text{Financial Profit Rate}_i \times \text{FPC4}_p$		0.0002**	0.0002**
		(0.0001)	(0.0001)
$\text{Post}_t \times \text{Liquidity Ratio}_i \times \text{FPC4}_p$		0.2058*	0.1892
		(0.1165)	(0.1247)
$\text{Post}_t \times \text{Leverage}_i \times \text{FPC4}_p$		-0.0011	-0.0001
		(0.0010)	(0.0010)
$\text{Post}_t \times \text{Firm Age}_i \times \text{FPC4}_p$		0.0026**	0.0044***
		(0.0011)	(0.0010)
$\text{Post}_t \times \text{Import}^{World}_{ip,2021}$		-0.0070***	-0.0095***
		(0.0004)	(0.0005)
$\text{Post}_t \times \text{FPC4}_p$			-0.0046
			(0.0053)
$\text{Post}_t \times \text{Sanction Product}_p$			0.0009
			(0.0040)
R^2	0.536	0.536	0.494
Firm x Product FE	✓	✓	✓
Firm x Quarter FE	✓	✓	✓
Product x Quarter FE	✓	✓	-
Observations	1446698	1446698	1448381

Notes: The table presents the regression estimations of Equation (8.1) where the dependent variable is the value of imports of products p by developing country firm i from Russia and Belarus. Financial Vulnerability$_p$ is the first principal component of external finance dependence, inventory ratio, (the negative of) trade credit intensity and (the negative of) asset tangibility collected from Manova et al. (2015). Financial Profit Rate$_i$ is firm i's financial profit divided by its financial expenditure in 2021. Liquidity Ratio$_i$ equals (*Current assets$_i$ − Stocks$_i$*) divided by *Current liabilities$_i$* in 2021. Leverage$_i$ equals (*Non current liabilities$_i$ + Loans$_i$*) divided by *Shareholders funds$_i$* in 2021. Firm Age$_i$ is the log value of firm i's age. Standard errors (in parentheses) are clustered at Firm-Product level $(i - p)$. *** p<0.01, ** p<0.05, * p<0.1.

from Russia (and Belarus). The implications of our work extend beyond the specific conflict between Russia and Ukraine, as we highlight the critical role of headquarters in shaping multinationals' trade adjustments to geopolitical tensions.

References

Ahn, Daniel P. and Rodney D. Ludema, "The sword and the shield: The economics of targeted sanctions," *European Economic Review*, 2020, *130*, 103587.

Ahn, JaeBin, Mary Amiti, and David E Weinstein, "Trade finance and the great trade collapse," *American Economic Review*, 2011, *101* (3), 298–302.

Aiyar, Mr Shekhar, Mr Jiaqian Chen, Christian Ebeke, Mr Christian H Ebeke, Mr Roberto Garcia-Saltos, Tryggvi Gudmundsson, Ms Anna Ilyina, Mr Alvar Kangur, Tansaya Kunaratskul, Mr Sergio L Rodriguez et al., *Geo-economic fragmentation and the future of multilateralism*, International Monetary Fund, 2023.

Aiyar, Shekhar, Andrea Presbitero, and Michele Ruta, *Geoeconomic Fragmentation the Economic Risks from a Fractured World Economy*, Centre for Economic Policy Research, 2023.

Alfaro, Laura and Davin Chor, "Global supply chains: The looming "great reallocation"," Technical Report, National Bureau of Economic Research 2023.

Alvarez, Roberto and Ricardo A López, "Exporting and performance: evidence from Chilean plants," *Canadian Journal of Economics/Revue canadienne d'économique*, 2005, *38* (4), 1384–1400.

_ **and** _ , "Entry and exit in international markets: Evidence from Chilean data," *Review of International Economics*, 2008, *16* (4), 692–708.

Amiti, Mary, Stephen J Redding, and David E Weinstein, "The impact of the 2018 tariffs on prices and welfare," *Journal of Economic Perspectives*, 2019, *33* (4), 187–210.

Antràs, Pol, "De-globalisation? Global value chains in the post-COVID-19 age," Technical Report, National Bureau of Economic Research 2020.

Antras, Pol and C Fritz Foley, "Poultry in motion: a study of international trade finance practices," *Journal of Political Economy*, 2015, *123* (4), 853–901.

Bachmann, Ruediger, David Baqaee, Christian Bayer, Moritz Kuhn, Andreas Löschel, Benjamin Moll, Andreas Peichl, Karen Pittel, and Moritz Schularick, "What if? The economic effects for Germany of a stop of energy imports from Russia," 2022. EconPol Policy Report 36, ifo Institute.

Baliga, Sandeep and Tomas Sjöström, "Optimal Sanctions," 2022. Working Paper.

Barrot, Jean-Noël and Julien Sauvagnat, "Input specificity and the propagation of idiosyncratic shocks in production networks," *The Quarterly Journal of Economics*, 2016, *131* (3), 1543–1592.

Becko, John Sturm, "A theory of economic sanctions as terms-of-trade manipulation," *Journal of International Economics*, 2024, p. 103898.

Bernard, Andrew B and Joachim Wagner, "Export entry and exit by German firms," *Weltwirtschaftliches Archiv*, 2001, *137* (1), 105–123.

_ , **J Bradford Jensen, Stephen J Redding, and Peter K Schott**, "The margins of US trade," *American Economic Review*, 2009, *99* (2), 487–493.

Besedeš, Tibor, Stefan Goldbach, and Volker Nitsch, "Cheap talk? Financial sanctions and non-financial firms," *European Economic Review*, 2021, *134*, 103688.

47

Boehm, Christoph E, Aaron Flaaen, and Nitya Pandalai-Nayar, "Input linkages and the transmission of shocks: Firm-level evidence from the 2011 Tōhoku earthquake," *Review of Economics and Statistics*, 2019, *101* (1), 60–75.

Broda, Christian and David E Weinstein, "Product creation and destruction: Evidence and price implications," *American Economic Review*, 2010, *100* (3), 691–723.

Cai, Sheng and Wei Xiang, "Multinational Production, Technology Diffusion, and Economic Growth," *Technology Diffusion, and Economic Growth (November 8, 2022)*, 2022.

Carvalho, Vasco M, Makoto Nirei, Yukiko U Saito, and Alireza Tahbaz-Salehi, "Supply chain disruptions: Evidence from the great east japan earthquake," *The Quarterly Journal of Economics*, 2021, *136* (2), 1255–1321.

Chen, Maggie Xiaoyang and Sumit Joshi, "Third-country effects on the formation of free trade agreements," *Journal of International Economics*, 2010, *82* (2), 238–248.

Chor, Davin and Kalina Manova, "Off the cliff and back? Credit conditions and international trade during the global financial crisis," *Journal of international economics*, 2012, *87* (1), 117–133.

Chowdhry, Sonali, Julian Hinz, Katrin Kamin, and Joschka Wanner, "Brothers in arms: The value of coalitions in sanctions regimes," Technical Report 2023.

Crowley, Meredith, Oliver Exton, and Lu Han, "Renegotiation of trade agreements and firm exporting decisions: evidence from the impact of Brexit on UK exports," in "Society of International Economic Law (SIEL), Sixth Biennial Global Conference" 2018.

Crozet, Matthieu and Julian Hinz, "Friendly fire: the trade impact of the Russia sanctions and counter-sanctions," *Economic Policy*, January 2020, *35* (101), 97–146.

_ , _ , Amrei Stammann, and Joschka Wanner, "Worth the pain? Firms' exporting behaviour to countries under sanctions," *European Economic Review*, 2021, *134*, 103683.

Draca, Mirko, Jason Garred, Leanne Stickland, and Nele Warrinnier, "On target? Sanctions and the economic interests of elite policymakers in Iran," *The Economic Journal*, 2023, *133* (649), 159–200.

Eaton, Jonathan and Maxim Engers, "Sanctions," *Journal of Political Economy*, 1992, *100* (5), 899–928.

Elliott, Kimberly Ann and Gary Clyde Hufbauer, "Same Song, Same Refrain? Economic Sanctions in the 1990's," *American Economic Review*, 1999, *89* (2), 403–408.

Evenett, Simon J and Marc-Andreas Muendler, "Isolating the Russian Economy: the Over-looked Role of International Shipping Costs," 2022. Accessed: 2022-07-10.

_ and _ , "Making Moscow Pay: How Much Extra Vite Will G7 & EU Trade Sanctions Have?," 2022. Accessed: 2022-07-10.

Fajgelbaum, Pablo D, Pinelopi K Goldberg, Patrick J Kennedy, and Amit K Khandelwal, "The return to protectionism," *The Quarterly Journal of Economics*, 2020, *135* (1), 1–55.

Fajgelbaum, Pablo, Pinelopi K Goldberg, Patrick J Kennedy, Amit Khandelwal, and Daria Taglioni, "The US-China trade war and global reallocations," *forthcoming in American Economic Review: Insights*, 2024.

Felbermayr, Gabriel, Aleksandra Kirilakha, Constantinos Syropoulos, Erdal Yalcin, and Yoto V. Yotov, "The global sanctions data base," *European Economic Review*, 2020, *129*, 103561.

_ , **Constantinos Syropoulos, Erdal Yalcin, and Yoto V. Yotov**, "On the Heterogeneous Effects of Sanctions on Trade and Welfare: Evidence from the Sanctions on Iran and a New Database," *School of Economics Working Paper Series 2020-04, Drexel University.*, 2020.

_ , **T. Clifton Morgan, Constantinos Syropoulos, and Yoto V. Yotov**, "Understanding economic sanctions: Interdisciplinary perspectives on theory and evidence," *European Economic Review*, 2021, *135*, 103720.

Feng, Alan, Haishi Li, and Yulin Wang, "We are All in the Same Boat: Cross-Border Spillovers of Climate Shocks Through International Trade and Supply Chain," Technical Report 2023.

Fernandes, Ana P and L Alan Winters, "Exporters and shocks: The impact of the Brexit vote shock on bilateral exports to the UK," *Journal of International Economics*, 2021, *131*, 103489.

Flaaen, Aaron, Ali Hortaçsu, and Felix Tintelnot, "The production relocation and price effects of US trade policy: the case of washing machines," *American Economic Review*, 2020, *110* (7), 2103–2127.

_ **and Justin R Pierce**, "Disentangling the effects of the 2018-2019 tariffs on a globally connected US manufacturing sector," Technical Report 2019.

_ , **Flora Haberkorn, Logan Lewis, Anderson Monken, Justin Pierce, Rosemary Rhodes, and Madeleine Yi**, "Bill of lading data in international trade research with an application to the COVID-19 pandemic," *Review of International Economics*, 2023, *31* (3), 1146–1172.

Freund, Caroline, Aaditya Mattoo, Alen Mulabdic, and Michele Ruta, "Is US trade policy reshaping global supply chains?," Technical Report 2023.

Ghironi, Fabio, Daisoon Kim, and Galip Kemal Ozhan, "International economic sanctions and third-country effects," *IMF Economic Review*, 2024, pp. 1–42.

Gopinath, Gita, Pierre-Olivier Gourinchas, Andrea Presbitero, and Petia B Topalova, "Changing Global Linkages: A New Cold War?," Technical Report 2024.

Graziano, Alejandro G, Kyle Handley, and Nuno Limão, "Brexit uncertainty and trade disintegration," *The Economic Journal*, 2021, *131* (635), 1150–1185.

Gullstrand, Joakim, "What goes around comes around: The effects of sanctions on Swedish firms in the wake of the Ukraine crisis," *World Economy*, September 2020, *43* (9), 2315–2342.

Handley, Kyle, Fariha Kamal, and Ryan Monarch, "Rising import tariffs, falling export growth: when modern supply chains meet old-style protectionism," Technical Report, National Bureau of Economic Research 2020.

Hinz, Julian and Evgenii Monastyrenko, "Bearing the cost of politics: Consumer prices and welfare in Russia," *Journal of International Economics*, 2022, *137*, 103581.

Huang, Yi, Chen Lin, Sibo Liu, and Heiwai Tang, "Trade networks and firm value: Evidence from the US-China trade war," *Journal of International Economics*, 2023, *145*, 103811.

Imbs, Jean and Laurent Pauwels, "An empirical approximation of the effects of trade sanctions with an application to Russia," *Economic Policy*, 2023, p. eiad027.

Itskhoki, Oleg and Dmitry Mukhin, "Sanctions and the Exchange Rate," Technical Report, National Bureau of Economic Research 2022.

Kasahara, Hiroyuki and Heiwai Tang, "Excessive entry and exit in export markets," *Journal of the Japanese and International Economies*, 2019, *53*, 101031.

Khanna, Gaurav, Nicolas Morales, and Nitya Pandalai-Nayar, "Supply chain resilience: Evidence from Indian firms," Technical Report, National Bureau of Economic Research 2022.

Korovkin, Vasily, Alexey Makarin, and Yuhei Miyauchi, "Supply Chain Disruption and Reorganization: Theory and Evidence from Ukraine's War," Technical Report 2024.

_ **and** _ , "Conflict and intergroup trade: Evidence from the 2014 Russia-Ukraine crisis," *American economic review*, 2023, *113* (1), 34–70.

Kupatadze, Alexander and Erica Marat, "Under the Radar: How Russia Outmanoeuvres Western Sanctions with Help from its Neighbours," Technical Report 2023.

Kwon, Ohyun, Constantinos Syropoulos, and Yoto V. Yotov, "The Extraterritorial Effects of Sanctions," 2022. Working Paper.

Lacy, Dean and Emerson M. S. Niou, "A Theory of Economic Sanctions and Issue Linkage: The Roles of Preferences, Information, and Threats," *The Journal of Politics*, February 2004, *66* (1), 25–42.

Lee, Woori, Alen Mulabdic, and Michele Ruta, "Third-country effects of regional trade agreements: A firm-level analysis," *Journal of International Economics*, 2023, *140*, 103688.

Lee, Yong Suk, "International isolation and regional inequality: Evidence from sanctions on North Korea," *Journal of Urban Economics*, 2018, *103*, 34–51.

Li, Haishi, "Multinational production and global shock propagation during the great recession," Technical Report 2023.

Lorenzoni, Guido and Iván Werning, "A Minimalist Model for the Ruble During the Russian Invasion of Ukraine," *National Bureau of Economic Research Working Paper Series*, 2022, *No. 29929*.

Manova, Kalina, "Credit constraints, heterogeneous firms, and international trade," *Review of Economic Studies*, 2013, *80* (2), 711–744.

_ **, Shang-Jin Wei, and Zhiwei Zhang**, "Firm exports and multinational activity under credit constraints," *Review of economics and statistics*, 2015, *97* (3), 574–588.

Mayr-Dorn, Karin, Gaia Narciso, Duc Anh Dang, and Hien Phan, "Trade diversion and labor market adjustment: Vietnam and the US-China trade war," *Available at SSRN 4444393*, 2023.

McCaig, Brian, Nina Pavcnik, and Woan Foong Wong, "FDI inflows and domestic firms: Adjustments to new export opportunities," Technical Report, National Bureau of Economic Research 2022.

Miromanova, Anna, "The Effectiveness of Embargoes: Evidence From Russia," 2021. Working Paper.

___ , "Quantifying the Trade Reducing Effect of Embargoes: Firm Level Evidence from Russia," 2021. Working Paper.

Monarch, Ryan and Tim Schmidt-Eisenlohr, "Longevity and the value of trade relationships," *Journal of International Economics*, 2023, *145*, 103842.

Niepmann, Friederike and Tim Schmidt-Eisenlohr, "International trade, risk and the role of banks," *Journal of International Economics*, 2017, *107*, 111–126.

Nigmatulina, Dzhamilya, "Sanctions and Misallocation. How Sanctioned Firms Won and Russia Lost.," *How Sanctioned Firms Won and Russia Lost.(April 12, 2021)*, 2021.

Nunn, Nathan, "Relationship-specificity, incomplete contracts, and the pattern of trade," *The quarterly journal of economics*, 2007, *122* (2), 569–600.

Pierce, Justin R and Peter K Schott, "A concordance between ten-digit US Harmonized System Codes and SIC/NAICS product classes and industries," *Journal of Economic and Social Measurement*, 2012, *37* (1-2), 61–96.

___ **and** ___ , "The surprisingly swift decline of US manufacturing employment," *American Economic Review*, 2016, *106* (7), 1632–1662.

Rajan, Raghuram G. and Luigi Zingales, "Financial dependence and growth," *American Economic Review*, 1998, *88* (3), 559–586.

Schmidt-Eisenlohr, Tim, "Towards a theory of trade finance," *Journal of International Economics*, 2013, *91* (1), 96–112.

Souza, Gustavo De and Haishi Li, "The employment consequences of anti-dumping tariffs: Lessons from Brazil," 2022.

___ **, Naiyuan Hu, Haishi Li, and Yuan Mei**, "(Trade) war and peace: How to impose international trade sanctions," *Journal of Monetary Economics*, 2024, p. 103572.

Sturm, John, "How Should Sanctions Account for Bystander Countries?," 2023. Working Paper.

Utar, Hâle, Luis Bernardo Torres Ruiz, and Alfonso Cebreros Zurita, "The US-China Trade War and the Relocation of Global Value Chains to Mexico," Technical Report 2023.

van Bergeijk, Peter A.G., "Sanctions and the Russian-Ukraine Conflict: a Critical Appraisal," 2022. Working Paper.

Whang, Taehee, Elena V. McLean, and Douglas W. Kuberski, "Coercion, Information, and the Success of Sanction Threats," *American Journal of Political Science*, January 2013, *57* (1), 65–81.

Wu, Sung-Ju, "Foreign Profit Shifting and The Welfare Responses to The US–China Trade War: Evidence from Manufacturers in Vietnam (Job Market Paper)," Technical Report 2024.

Xue, Sifan, "Trade Wars with FDI Diversion," Technical Report 2023.

Appendix A   Additional Tables and Figures: Summary Statistics

Figure A.1: Comparing Trade Values between Panjiva and Comtrade

(a) Pre-war Export
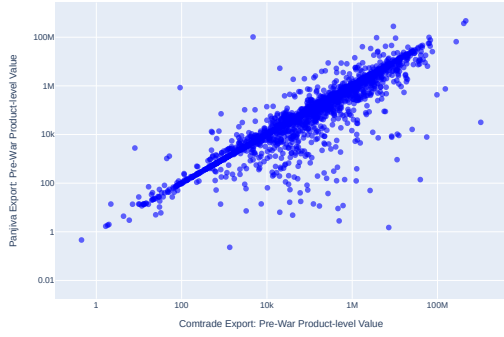
(b) Post-war Export
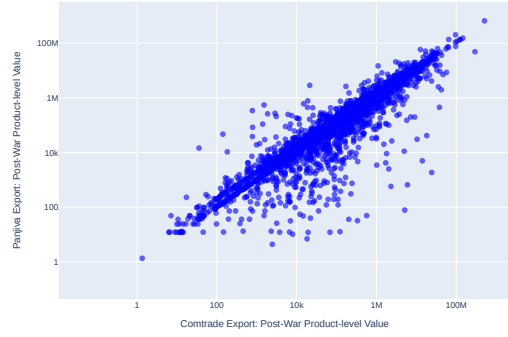
(c) Pre-war Import
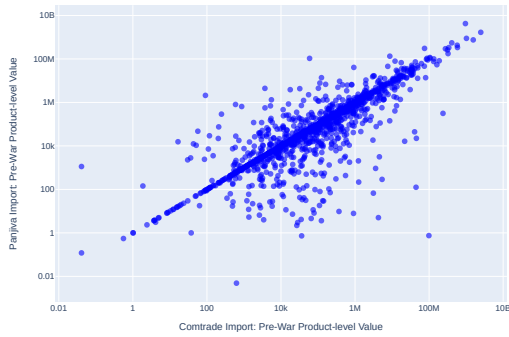
(d) Post-war Import

Notes: These figures present trade values from S&P Panjiva (y-axis) and UN Comtrade (x-axis) at the 6-digit HS Code level, covering both pre-war and post-war periods. The pre-war period includes 2021Q1-2021Q4, and post-war period includes 2022Q1-2023Q3. Each data point refers to the trade value of a product between the developing countries that we consider (Mexico, India, and Vietnam) and Russia (and Belarus), as calculated by S&P Panjiva and reported in UN Comtrade. Data for India, Mexico, and Vietnam are pooled together. The correlation coefficient and R2 for these figures are as follows. A.1a: corr=0.888, R2 = 0.788; A.1b: corr= 0.912, R2=0.831; A.1c: corr = 0.811, R2 = 0.658; A.1d: corr = 0.803, R2 = 0.644.

Table A.1: Pre-war Exports Summary Statistics by Sector

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	Agriculture	31	1.4	1.9	2.2	1.6	1.2	364,763	163,879
	Mining and Energy	2	1.0	2.0	2.0	2.0	1.0	343,549	171,774
	Durables	80	4.7	2.3	9.4	2.0	4.1	876,365	93,354
	Nondurables	38	1.6	1.5	2.1	1.3	1.4	257,945	125,666
Vietnam	Agriculture	236	2.7	3.3	5.7	2.1	1.7	1,205,454	213,259
	Mining and Energy	1	1.0	3.0	3.0	3.0	1.0	1,358,811	452,937
	Durables	198	3.2	1.7	4.2	1.3	2.4	1,072,328	257,984
	Nondurables	305	4.0	1.8	5.4	1.3	3.0	904,856	168,179
India	Agriculture	313	1.9	2.6	3.7	1.9	1.4	1,837,939	499,371
	Mining and Energy	23	1.4	2.2	2.5	1.8	1.2	310,937	123,302
	Durables	1,181	3.0	2.3	5.0	1.7	2.2	1,458,426	292,925
	Nondurables	1,216	3.2	2.5	5.2	1.6	2.1	993,344	191,792

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each sector for exports in the pre-war periods. We assign each firm a sector based on the most heavily traded product's HS 2 code.

Table A.2: Post-war Exports Summary Statistics by Sector

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	Agriculture	27	1.4	1.5	1.8	1.3	1.2	281,535	155,131
	Mining and Energy	0	NA	NA	NA	NA	NA	NA	NA
	Durables	56	5.0	2.6	9.3	1.9	3.6	670,288	72,464
	Nondurables	28	1.7	1.3	1.9	1.1	1.5	319,341	168,709
Vietnam	Agriculture	245	2.6	3.3	5.4	2.1	1.7	1,781,789	328,224
	Mining and Energy	4	1.5	1.3	1.8	1.2	1.4	4,101,670	2,343,812
	Durables	229	4.0	1.9	5.3	1.3	2.8	1,037,886	197,241
	Nondurables	314	4.1	2.2	6.0	1.5	2.7	1,698,326	283,054
India	Agriculture	367	2.4	3.9	5.7	2.4	1.5	3,714,782	650,131
	Mining and Energy	39	1.5	2.7	3.2	2.1	1.2	704,595	219,834
	Durables	1,699	4.4	3.1	8.7	2.0	2.8	1,281,510	146,727
	Nondurables	1,675	4.9	3.3	9.1	1.9	2.8	1,634,467	180,007

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each sector for exports in the post-war periods. We assign each firm a sector based on the most heavily traded product's HS 2 code.

Table A.3: Pre-war Imports Summary Statistics by Sector

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	Agriculture	16	1.9	1.2	2.0	1.0	1.7	205,209	102,605
	Mining and Energy	3	4.7	1.7	4.7	1.0	2.8	72,381	15,510
	Durables	73	4.5	1.5	5.1	1.1	3.5	347,707	68,602
	Nondurables	35	1.6	1.3	1.8	1.1	1.4	197,027	111,225
Vietnam	Agriculture	127	1.6	2.6	3.2	2.0	1.2	2,086,880	659,288
	Mining and Energy	22	5.3	3.3	7.0	1.3	2.1	20,324,772	2,903,539
	Durables	263	3.2	2.0	4.4	1.4	2.2	1,499,399	338,491
	Nondurables	235	1.4	1.9	2.3	1.6	1.2	749,856	330,612
India	Agriculture	74	1.4	1.8	2.0	1.4	1.1	12,250,398	6,166,867
	Mining and Energy	123	1.8	2.5	3.0	1.7	1.2	25,912,163	8,780,154
	Durables	929	2.3	4.6	6.0	2.6	1.3	5,322,597	888,215
	Nondurables	563	1.6	1.9	2.4	1.5	1.2	2,114,583	895,794

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each sector for imports in the pre-war periods. We assign each firm a sector based on the most heavily traded product's HS 2 code.

Table A.4: Post-war Imports Summary Statistics by Sector

Country	Type	# Firms	# Products per Firm	# Partners per Firm	# SCs per Firm	# SCs per Firm-Product	# SCs per Firm-Partner	Value per Firm	Value per SC
Mexico	Agriculture	6	2.0	1.8	2.5	1.3	1.4	353,935	141,574
	Mining and Energy	1	2.0	2.0	3.0	1.5	1.5	122,665	40,888
	Durables	62	3.6	1.4	3.9	1.1	2.8	604,174	154,151
	Nondurables	24	1.6	1.3	1.8	1.2	1.4	164,560	89,760
Vietnam	Agriculture	112	1.9	2.9	3.8	2.0	1.3	4,813,704	1,280,605
	Mining and Energy	27	2.3	2.2	3.0	1.3	1.4	26,523,697	8,841,232
	Durables	255	3.7	2.0	5.3	1.4	2.7	1,513,153	287,522
	Nondurables	217	2.1	1.9	3.1	1.5	1.6	1,015,155	323,954
India	Agriculture	137	1.5	4.2	4.6	3.1	1.1	49,105,513	10,695,477
	Mining and Energy	135	1.9	5.5	6.1	3.3	1.1	619,688,284	100,792,673
	Durables	789	3.2	3.0	6.1	1.9	2.0	7,975,785	1,317,884
	Nondurables	593	1.9	2.4	3.3	1.8	1.3	4,588,154	1,397,419

Notes: This table presents the number of firms, the number of products, partners, and supply chains per firm, and trade value per firm and per supply chain within each sector for exports in the post-war periods. We assign each firm a sector based on the most heavily traded product's HS 2 code.

Table A.5: MNE Shares in Host Country Trade

		Export					Import				
		Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values	Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values
		Panel A: Pre-war Trade Shares by MNE Type									
Mexico	Sanctioning MNEs	25.83%	36.06%	51.02%	64.19%	60.61%	36.22%	40.14%	38.24%	33.89%	34.90%
	Non-sanctioning MNEs	24.50%	29.00%	22.79%	13.75%	15.55%	20.47%	22.45%	20.96%	14.23%	13.84%
	Domestic	49.67%	37.55%	46.60%	22.06%	23.84%	43.31%	44.90%	66.54%	51.88%	51.25%
Vietnam	Sanctioning MNEs	5.27%	6.17%	18.10%	6.95%	12.49%	5.26%	6.94%	7.05%	3.95%	2.80%
	Non-sanctioning MNEs	2.16%	2.36%	6.39%	1.60%	2.24%	2.47%	2.58%	2.19%	1.24%	1.53%
	Domestic	92.57%	93.02%	94.97%	91.45%	85.27%	92.27%	92.57%	97.02%	94.81%	95.67%
India	Sanctioning MNEs	6.66%	9.48%	19.82%	9.33%	19.20%	5.98%	10.08%	20.17%	4.81%	3.34%
	Non-sanctioning MNEs	0.95%	1.58%	2.23%	0.63%	0.46%	1.42%	2.57%	4.91%	0.97%	3.15%
	Domestic	92.39%	91.66%	95.71%	90.04%	80.34%	92.60%	92.39%	93.60%	94.22%	93.52%
		Panel B: Post-war Trade Shares by MNE									
Mexico	Sanctioning MNEs	26.13%	18.69%	24.72%	22.74%	29.75%	37.63%	35.96%	33.50%	28.20%	54.70%
	Non-sanctioning MNEs	23.42%	40.40%	14.76%	17.58%	28.15%	17.20%	18.42%	8.00%	7.54%	6.17%
	Domestic	50.45%	42.42%	75.65%	59.68%	42.10%	45.16%	49.12%	72.00%	64.26%	39.13%
Vietnam	Sanctioning MNEs	4.67%	7.31%	16.32%	6.80%	4.61%	5.24%	6.71%	5.77%	3.45%	2.57%
	Non-sanctioning MNEs	2.53%	3.14%	7.08%	2.46%	5.38%	2.29%	2.07%	1.97%	0.91%	0.78%
	Domestic	92.80%	91.27%	95.32%	90.74%	90.00%	92.47%	93.18%	97.51%	95.64%	96.65%
India	Sanctioning MNEs	5.00%	5.32%	14.80%	3.41%	4.95%	5.50%	7.28%	22.99%	5.92%	1.31%
	Non-sanctioning MNEs	0.69%	1.17%	2.22%	0.43%	0.90%	1.27%	2.57%	2.21%	0.94%	0.77%
	Domestic	94.31%	95.12%	98.77%	96.16%	94.14%	93.23%	94.15%	92.11%	93.14%	97.92%

Notes: This table presents, for the pre-war in Panel A and post-war period in Panel B, the share of MNEs in the total number of firms engaged in trade with Russia (and Belarus), total number of products traded with Russia (and Belarus), total number of Russian/Belarusian trade partners, total number of supply chains involving Russia (and Belarus), and trade value with Russia (and Belarus) for both exports and imports between these neutral developing countries and Russia (and Belarus). A supply chain refers to a neutral developing country trading firm-Russian/Belarusian firm-product relationship.

Table A.6: MNE Shares in Host Country Trade in Agriculture Sector

		Export					Import				
		Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values	Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values
		Panel A: Pre-war Trade Shares by MNE Type									
Mexico	Sanctioning MNEs	6.45%	3.77%	7.69%	2.90%	20.89%	31.25%	40.00%	29.17%	25.00%	97.03%
	Non-sanctioning MNEs	22.58%	28.30%	26.92%	24.64%	23.61%	18.75%	20.00%	8.33%	9.38%	0.00%
	Domestic	70.97%	73.58%	84.62%	72.46%	55.50%	50.00%	40.00%	70.83%	65.63%	2.96%
Vietnam	Sanctioning MNEs	1.27%	0.87%	2.72%	0.45%	0.09%	4.72%	6.40%	20.00%	6.47%	3.79%
	Non-sanctioning MNEs	1.27%	0.87%	2.72%	0.45%	0.90%	0.79%	0.40%	1.43%	0.25%	2.16%
	Domestic	97.46%	99.13%	98.91%	99.10%	99.01%	94.49%	94.00%	95.71%	93.28%	94.05%
India	Sanctioning MNEs	2.88%	2.37%	8.82%	2.17%	1.09%	5.41%	11.63%	6.25%	6.80%	0.21%
	Non-sanctioning MNEs	0.64%	0.79%	1.47%	0.35%	0.76%	1.35%	2.33%	2.08%	1.36%	0.73%
	Domestic	96.49%	97.83%	99.26%	97.48%	98.15%	93.24%	93.02%	100.00%	91.84%	99.06%
		Panel B: Post-war Trade Shares by MNE									
Mexico	Sanctioning MNEs	7.41%	5.13%	11.54%	6.12%	1.90%	66.67%	40.00%	36.36%	26.67%	95.47%
	Non-sanctioning MNEs	22.22%	28.21%	26.92%	26.53%	34.90%	0.00%	0.00%	0.00%	0.00%	0.00%
	Domestic	70.37%	66.67%	76.92%	67.35%	63.19%	33.33%	60.00%	63.64%	73.33%	4.53%
Vietnam	Sanctioning MNEs	1.22%	0.93%	2.42%	0.45%	0.37%	6.25%	7.94%	17.58%	6.65%	2.90%
	Non-sanctioning MNEs	1.63%	0.93%	3.64%	0.45%	0.38%	0.89%	0.79%	2.20%	0.48%	1.26%
	Domestic	97.14%	98.84%	98.79%	99.10%	99.25%	92.86%	93.25%	94.51%	92.87%	95.83%
India	Sanctioning MNEs	1.36%	1.95%	6.64%	1.62%	1.24%	5.11%	3.21%	17.65%	2.07%	0.73%
	Non-sanctioning MNEs	0.54%	0.92%	0.88%	0.43%	0.27%	1.46%	2.88%	5.88%	1.43%	0.59%
	Domestic	98.09%	98.16%	98.23%	97.95%	98.49%	93.43%	99.04%	94.12%	96.50%	98.68%

Notes: This table presents, for the pre-war in Panel A and post-war period in Panel B, for firms in the agriculture sector, the share of MNEs in the total number of firms engaged in trade with Russia (and Belarus), total number of products traded with Russia (and Belarus), total number of Russian/Belarusian trade partners, total number of supply chains involving Russia (and Belarus), and trade value with Russia (and Belarus) for both exports and imports between these neutral developing countries and Russia (and Belarus). A supply chain refers to a neutral developing country trading firm-Russian/Belarusian firm-product relationship.

Table A.7: MNE Shares in Host Country Trade in Mining and Energy Sector

		Export					Import				
		Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values	Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values
		Panel A: Pre-war Trade Shares by MNE Type									
Mexico	Sanctioning MNEs	50.00%	50.00%	50.00%	50.00%	40.98%	66.67%	75.00%	81.82%	85.71%	47.80%
	Non-sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	33.33%	25.00%	18.18%	14.29%	52.20%
	Domestic	50.00%	50.00%	50.00%	50.00%	59.02%	0.00%	0.00%	0.00%	0.00%	0.00%
Vietnam	Sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Non-sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	9.09%	4.55%	0.96%	2.60%	0.16%
	Domestic	100.00%	100.00%	100.00%	100.00%	100.00%	90.91%	95.45%	99.04%	97.40%	99.84%
India	Sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	4.07%	9.50%	9.41%	6.34%	5.76%
	Non-sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	4.07%	4.50%	7.06%	2.48%	0.69%
	Domestic	100.00%	100.00%	100.00%	100.00%	100.00%	91.87%	92.50%	96.47%	91.18%	93.55%
		Panel B: Post-war Trade Shares by MNE									
Mexico	Sanctioning MNEs	NA	NA	NA	NA	NA	0.00%	0.00%	0.00%	0.00%	0.00%
	Non-sanctioning MNEs	NA	NA	NA	NA	NA	100.00%	100.00%	100.00%	100.00%	100.00%
	Domestic	NA	NA	NA	NA	NA	0.00%	0.00%	0.00%	0.00%	0.00%
Vietnam	Sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	Non-sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	11.11%	5.77%	9.30%	6.17%	0.06%
	Domestic	100.00%	100.00%	100.00%	100.00%	100.00%	88.89%	94.23%	93.02%	93.83%	99.94%
India	Sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	2.96%	7.35%	12.05%	3.98%	1.29%
	Non-sanctioning MNEs	0.00%	0.00%	0.00%	0.00%	0.00%	2.96%	3.08%	6.02%	1.81%	0.16%
	Domestic	100.00%	100.00%	100.00%	100.00%	100.00%	94.07%	95.26%	92.77%	94.22%	98.55%

Notes: This table presents, for the pre-war in Panel A and post-war period in Panel B, for firms in the mining and energy sector, the share of MNEs in the total number of firms engaged in trade with Russia (and Belarus), total number of products traded with Russia (and Belarus), total number of Russian trade partners, total number of supply chains involving Russia (and Belarus), and trade value with Russia (and Belarus) for both exports and imports between these neutral developing countries and Russia (and Belarus). A supply chain refers to a neutral developing country trading firm-Russian/Belarusian firm-product relationship.

Table A.8: MNE Shares in Host Country Trade in Durable Goods Manufacturing Sector

		Export					Import				
		Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values	Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values
		Panel A: Pre-war Trade Shares by MNE Type									
Mexico	Sanctioning MNEs	35.00%	48.78%	60.00%	73.64%	72.13%	39.73%	41.57%	36.89%	33.78%	20.01%
	Non-sanctioning MNEs	23.75%	29.27%	20.00%	11.32%	13.22%	12.33%	15.73%	20.39%	12.43%	10.51%
	Domestic	41.25%	23.78%	39.57%	15.05%	14.65%	47.95%	51.69%	71.84%	53.78%	69.48%
Vietnam	Sanctioning MNEs	9.09%	11.91%	21.63%	15.31%	38.94%	4.56%	7.30%	3.34%	2.83%	4.88%
	Non-sanctioning MNEs	3.03%	3.97%	2.82%	1.70%	1.61%	2.28%	2.52%	1.54%	0.86%	0.32%
	Domestic	87.88%	86.64%	93.10%	82.99%	59.45%	93.16%	92.44%	97.94%	96.31%	94.81%
India	Sanctioning MNEs	11.60%	16.02%	30.58%	19.01%	36.67%	5.06%	7.72%	18.89%	3.77%	1.24%
	Non-sanctioning MNEs	0.93%	0.87%	1.65%	0.41%	0.43%	1.18%	1.69%	4.45%	0.77%	5.91%
	Domestic	87.47%	85.77%	92.25%	80.58%	62.90%	93.76%	93.26%	93.70%	95.46%	92.84%
		Panel B: Post-war Trade Shares by MNE									
Mexico	Sanctioning MNEs	37.50%	23.08%	25.47%	23.94%	35.28%	37.10%	37.84%	33.54%	28.81%	52.08%
	Non-sanctioning MNEs	23.21%	46.92%	9.91%	16.02%	31.94%	11.29%	10.81%	4.43%	3.29%	4.34%
	Domestic	39.29%	32.31%	78.30%	60.04%	32.78%	51.61%	55.41%	75.32%	67.90%	43.58%
Vietnam	Sanctioning MNEs	5.68%	11.44%	15.07%	11.12%	15.50%	5.10%	6.11%	3.00%	2.31%	6.04%
	Non-sanctioning MNEs	2.62%	4.90%	5.94%	3.98%	2.90%	1.57%	1.02%	0.86%	0.37%	0.08%
	Domestic	91.70%	86.65%	93.15%	84.90%	81.61%	93.33%	94.66%	98.50%	97.32%	93.88%
India	Sanctioning MNEs	7.77%	7.27%	17.47%	5.46%	9.75%	4.94%	5.85%	23.12%	6.81%	0.96%
	Non-sanctioning MNEs	0.71%	0.77%	1.86%	0.32%	1.23%	1.52%	2.80%	1.55%	0.86%	9.37%
	Domestic	91.52%	93.47%	98.21%	94.22%	89.02%	93.54%	93.38%	89.71%	92.34%	89.67%

Notes: This table presents, for the pre-war in Panel A and post-war period in Panel B, for firms in the durable goods manufacturing sector, the share of MNEs in the total number of firms engaged in trade with Russia (and Belarus), total number of products traded with Russia (and Belarus), total number of Russian/Belarusian trade partners, total number of supply chains involving Russia (and Belarus), and trade value with Russia (and Belarus) for both exports and imports between these neutral developing countries and Russia (and Belarus). A supply chain refers to a neutral developing country trading firm-Russian/Belarusian firm-product relationship.

Table A.9: MNE Shares in Host Country Trade in Non-durable Goods Manufacturing Sector

		Export					Import				
		Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values	Share of Firms	Share of Products	Share of Partners	Share of Supply Chains	Share of Trade Values
		Panel A: Pre-war Trade Shares by MNE Type									
Mexico	Sanctioning MNEs	21.05%	26.42%	32.69%	28.21%	25.37%	28.57%	30.95%	36.36%	27.42%	59.74%
	Non-sanctioning MNEs	28.95%	30.19%	26.92%	28.21%	24.00%	37.14%	35.71%	27.27%	27.42%	31.50%
	Domestic	50.00%	45.28%	46.15%	43.59%	50.64%	34.29%	35.71%	45.45%	45.16%	8.76%
Vietnam	Sanctioning MNEs	5.90%	8.01%	21.48%	8.04%	4.97%	6.81%	8.12%	13.33%	5.63%	3.74%
	Non-sanctioning MNEs	2.30%	2.84%	11.62%	2.50%	4.12%	2.98%	3.90%	4.44%	2.44%	6.77%
	Domestic	91.80%	90.44%	93.66%	89.46%	90.90%	90.21%	91.23%	93.33%	91.93%	89.49%
India	Sanctioning MNEs	2.96%	3.80%	6.11%	1.68%	3.02%	7.99%	14.20%	21.90%	8.50%	7.93%
	Non-sanctioning MNEs	1.07%	2.67%	2.32%	0.91%	0.35%	1.24%	3.45%	3.65%	1.35%	0.07%
	Domestic	95.97%	96.14%	98.63%	97.41%	96.63%	90.76%	89.25%	90.88%	90.14%	92.00%
		Panel B: Post-war Trade Shares by MNE									
Mexico	Sanctioning MNEs	21.43%	18.75%	27.91%	26.42%	30.19%	33.33%	29.03%	32.35%	27.27%	59.35%
	Non-sanctioning MNEs	25.00%	25.00%	27.91%	24.53%	6.54%	33.33%	35.48%	23.53%	27.27%	23.92%
	Domestic	53.57%	56.25%	48.84%	49.06%	63.28%	33.33%	35.48%	52.94%	45.45%	16.73%
Vietnam	Sanctioning MNEs	6.69%	9.54%	21.26%	8.55%	3.38%	5.53%	7.45%	7.00%	4.12%	4.04%
	Non-sanctioning MNEs	3.18%	3.58%	8.91%	2.92%	10.76%	2.76%	3.90%	2.50%	1.62%	3.16%
	Domestic	90.13%	88.27%	95.69%	88.54%	85.87%	91.71%	90.78%	97.00%	94.26%	92.81%
India	Sanctioning MNEs	3.10%	3.75%	7.14%	1.68%	3.04%	6.91%	10.80%	12.19%	5.80%	4.12%
	Non-sanctioning MNEs	0.72%	1.70%	1.69%	0.55%	0.97%	0.51%	1.42%	1.00%	0.62%	0.03%
	Domestic	96.18%	96.22%	99.44%	97.76%	95.99%	92.58%	92.19%	97.01%	93.58%	95.85%

Notes: This table presents, for the pre-war in Panel A and post-war period in Panel B, for firms in the non-durable goods manufacturing sector, the share of MNEs in the total number of firms engaged in trade with Russia (and Belarus), total number of products traded with Russia (and Belarus), total number of Russian/Belarusian trade partners, total number of supply chains involving Russia (and Belarus), and trade value with Russia (and Belarus) for both exports and imports between these neutral developing countries and Russia (and Belarus). A supply chain refers to a neutral developing country trading firm-Russian/Belarusian firm-product relationship.

Table A.10: Pre-war Summary of Sanctioned Products

	# Sanctioned Products	Sanctioned Product Value Share in Sectoral Trade					
	(Share in Sectoral Product #)	Export			Import		
Sector		Mexico	Vietnam	India	Mexico	Vietnam	India
Agriculture	33 (3.34%)	20.41%	0.19%	3.77%	1.44%	0.21%	11.72%
Mining and Energy	39 (26.53%)	0%	100.00%	92.69%	91.19%	83.21%	46.12%
Durables	1495 (64.58%)	72.48%	65.86%	45.51%	35.61%	82.08%	13.02%
Nondurables	564 (26.07%)	11.58%	22.09%	7.44%	59.42%	41.04%	30.58%
All	2131 (37.97%)	59.04%	26.18%	25.68%	37.18%	59.92%	25.26%

Notes: This table presents the number and share of 6-digit HS code products subject to sanctions across various sectors, as well as the percentage of pre-war trade with Russia (and Belarus) that these sanctioned products accounted for. The sanctioned product lists are derived from Supplements No. 2, No. 4, No. 5, and No. 7 of Part 746 of the Export Administration Regulations (EAR) (https://www.bis.doc.gov/index.php/regulations/export-administration-regulations-ear. Products included in these supplements require licenses for export to Russia or Belarus.

Table A.11: Post-war Summary of Sanctioned Products

Sector	# Sanctioned Products (Share in Sectoral Product #)	Sanctioned Product Value Share in Sectoral Trade					
		Export			Import		
		Mexico	Vietnam	India	Mexico	Vietnam	India
Agriculture	33 (3.34%)	51.35%	0.07%	9.99%	0.09%	0.37%	0.60%
Mining and Energy	39 (26.53%)	NA	99.89%	73.43%	39.67%	95.12%	14.71%
Durables	1495 (64.58%)	37.48%	52.28%	75.93%	57.83%	68.77%	27.10%
Nondurables	564 (26.07%)	2.92%	27.82%	17.88%	62.59%	30.24%	14.69%
All	2131 (37.97%)	33.72%	23.64%	36.46%	55.29%	54.54%	14.54%

Notes: This table presents the number and share of 6-digit HS code products subject to sanctions across various sectors, as well as the percentage of post-war trade with Russia (and Belarus) that these sanctioned products accounted for. The sanctioned product lists are derived from Supplements No. 2, No. 4, No. 5, and No. 7 of Part 746 of the Export Administration Regulations (EAR) (https://www.bis.doc.gov/index.php/regulations/export-administration-regulations-ear. Products included in these supplements require licenses for export to Russia or Belarus.

Table A.12: Export Entry and Exit Rates by Sector

Country	Sector	Value Growth	Contribution	Exit rate			Entry rate		
				Supply Chain	Firm-Product	Firm	Supply Chain	Firm-Product	Firm
Mexico	Agriculture	-61.59%	11.42%	0.52	0.30	0.24	0.28	0.18	0.11
	Mining and Energy	-100.00%	1.13%	1.00	1.00	1.00	NA	NA	NA
	Durables	-69.41%	79.77%	0.77	0.58	0.35	0.69	0.72	0.25
	Nondurables	-47.87%	7.69%	0.60	0.45	0.27	0.48	0.38	0.23
Vietnam	Agriculture	-12.32%	46.85%	0.44	0.28	0.14	0.43	0.23	0.14
	Mining and Energy	589.96%	-10.72%	1.00	1.00	1.00	1.00	1.00	1.00
	Durables	-36.03%	102.31%	0.33	0.27	0.20	0.48	0.41	0.29
	Nondurables	10.42%	-38.44%	0.42	0.32	0.20	0.52	0.37	0.22
India	Agriculture	35.42%	224.93%	0.43	0.22	0.13	0.60	0.34	0.19
	Mining and Energy	119.57%	9.44%	0.52	0.20	0.11	0.74	0.51	0.43
	Durables	-27.77%	-527.90%	0.56	0.31	0.17	0.80	0.59	0.36
	Nondurables	29.51%	393.54%	0.56	0.31	0.14	0.78	0.57	0.29

Notes: This table presents the changes in export values to Russia and Belarus for each country and sector, from pre-war to post-war periods. It also shows sectoral contributions to country-level export changes and the exit-entry rates at various levels, including supply chain, firm-product, and trading firm. Trade growth is computed with the method discussed in Section 3, taking into account the different time window lengths between the pre-war and post-war periods.

Figure A.2: Trade with Russia and Belarus by MNE Status

(a) Mexican Export
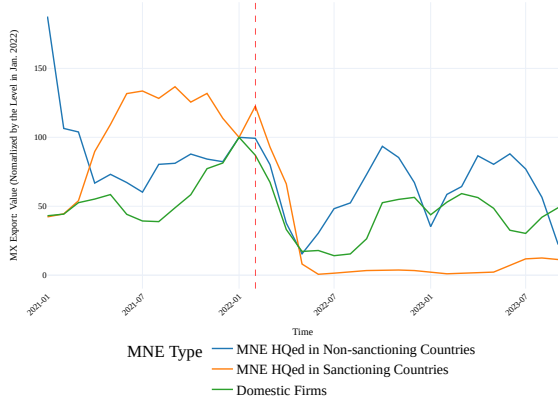
(b) Mexican Import
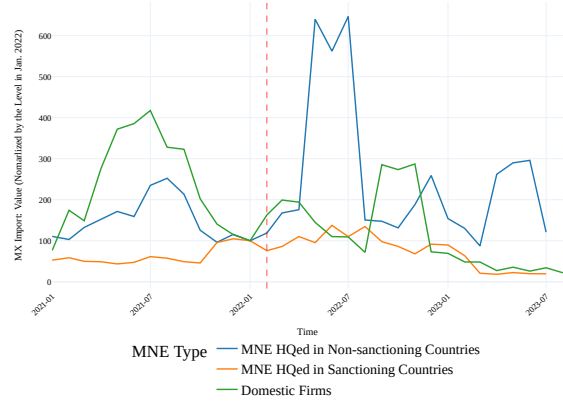
(c) Vietnamese Export
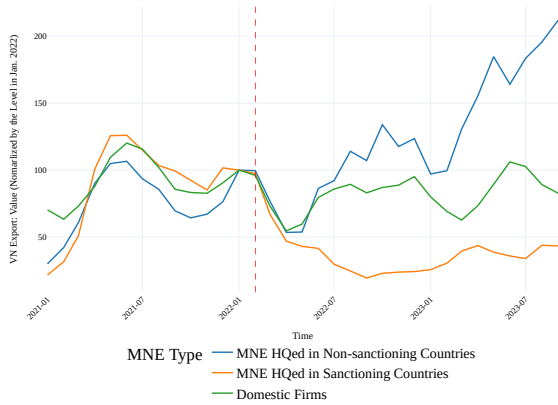
(d) Vietnamese Import
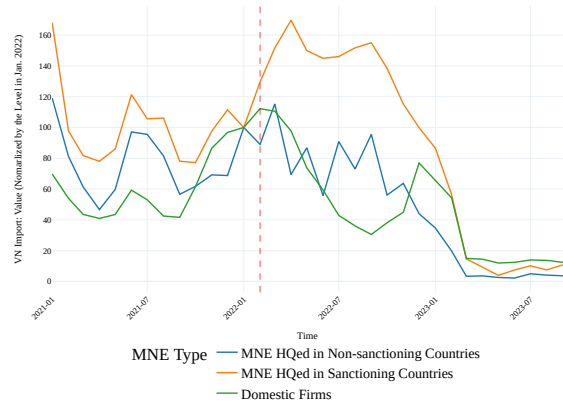
(e) Indian Export
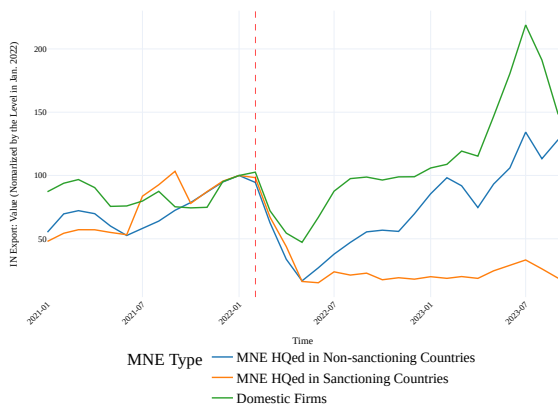
(f) Indian Import
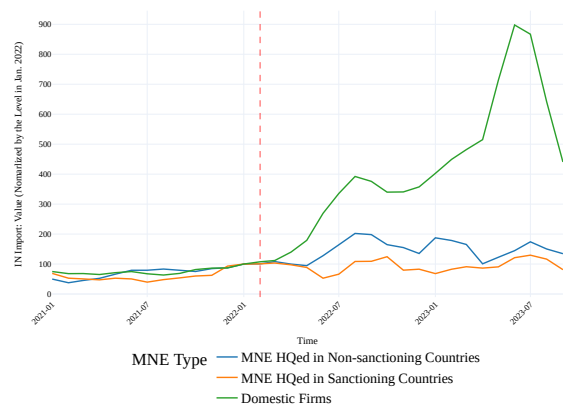
Notes: This figure presents the 3-month moving average of monthly export and import values for developing country trade with Russia (and Belarus). A sanctioning MNE is defined as one originating from the Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, South Korea, Spain, Sweden, Switzerland, Taiwan, United Kingdom, and the United States. MNEs originating from other countries are classified as non-sanctioning MNEs. Each line is normalized such that value = 100 in Jan. 2022.

Figure A.3: Trade with Russia and Belarus by Sector
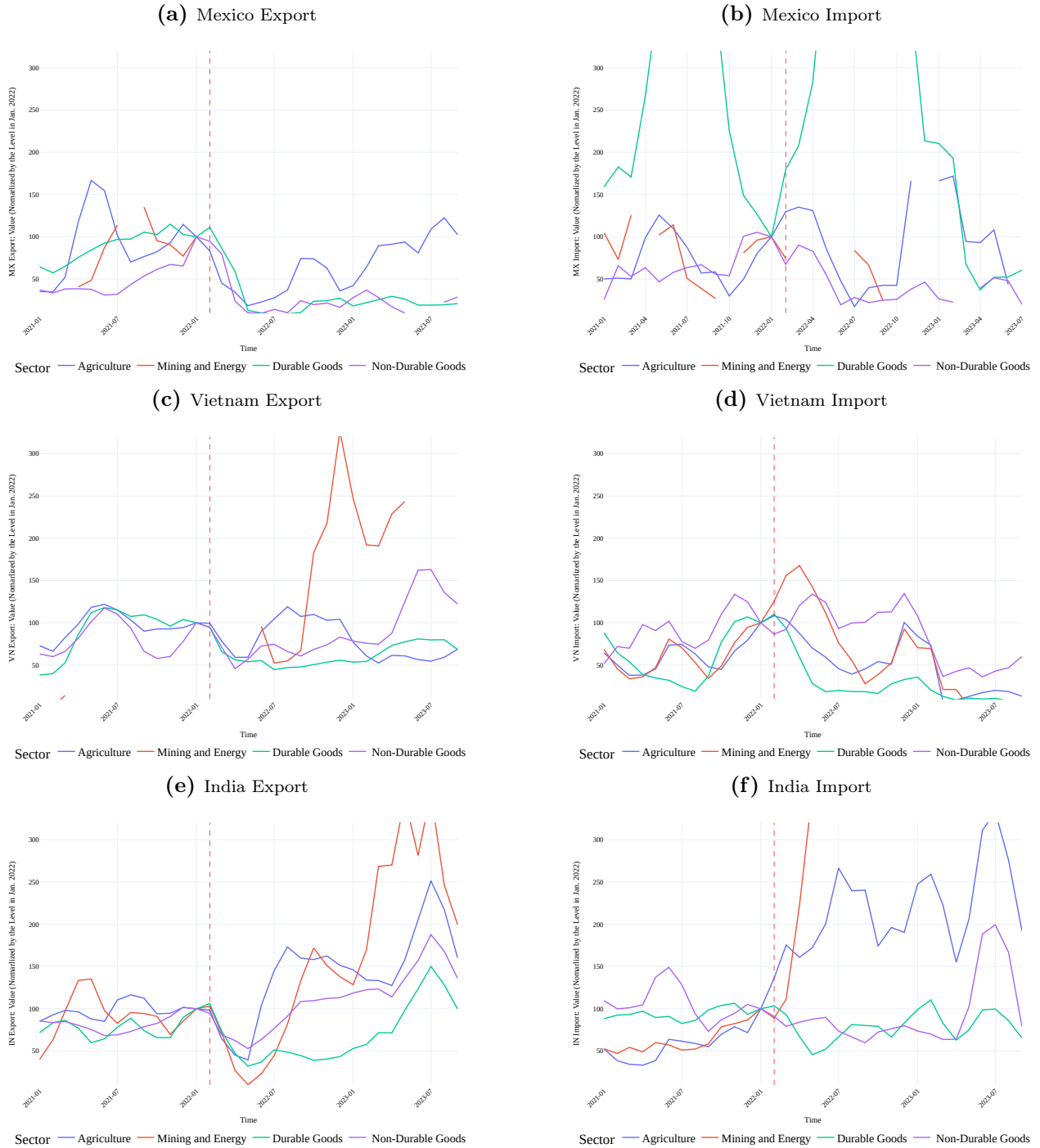
(a) Mexico Export

(b) Mexico Import

(c) Vietnam Export

(d) Vietnam Import

(e) India Export

(f) India Import

Notes: This figure presents the 3-month moving average of monthly export and import values for developing country trade with Russia (and Belarus). We assign each firm a sector based on the most heavily traded product's HS 2 code. Each line is normalized such that value = 100 in Jan. 2022.

Table A.13: Import Entry and Exit Rates by Sector

Country	Sector	Value Growth	Contribution	Exit rate			Entry rate		
				Supply Chain	Firm-Product	Firm	Supply Chain	Firm-Product	Firm
Mexico	Agriculture	-63.04%	19.11%	0.87	0.87	0.82	0.57	0.58	0.46
	Mining and Energy	-67.72%	1.36%	0.75	0.75	0.50	0.50	0.00	0.00
	Durables	-15.67%	36.72%	0.82	0.75	0.42	0.65	0.65	0.34
	Nondurables	-67.27%	42.82%	0.68	0.57	0.48	0.43	0.47	0.33
Vietnam	Agriculture	16.24%	-19.65%	0.60	0.34	0.24	0.63	0.35	0.15
	Mining and Energy	-8.48%	17.31%	0.74	0.62	0.20	0.50	0.30	0.25
	Durables	-44.09%	79.36%	0.67	0.49	0.25	0.71	0.49	0.23
	Nondurables	-28.57%	22.98%	0.66	0.37	0.26	0.75	0.48	0.20
India	Agriculture	324.06%	6.31%	0.57	0.29	0.22	0.88	0.54	0.45
	Mining and Energy	1399.89%	95.81%	0.53	0.32	0.22	0.82	0.45	0.30
	Durables	-27.28%	-2.90%	0.75	0.47	0.33	0.75	0.54	0.27
	Nondurables	30.59%	0.78%	0.61	0.45	0.31	0.73	0.50	0.29

Notes: This table presents the changes in import values to Russia and Belarus for each country and sector, from pre-war to post-war periods. It also shows sectoral contributions to country-level import changes and the exit-entry rates at various levels, including supply chain, firm-product, and trading firm. Trade growth is computed with the method discussed in Section 3, taking into account the different time window lengths between the pre-war and post-war periods.

Table A.14: Decomposition by Margins within Agriculture Sector

Trading Firm Status	Partner Status	Product Status	Export			Import		
			Mexico	Vietnam	India	Mexico	Vietnam	India
Trading Firm Entry			-5.02%	-81.10%	26.13%	-55.98%	19.78%	26.24%
Trading Firm Exit			31.40%	32.21%	-9.19%	156.37%	-211.60%	-0.19%
Continuing Trading Firms			73.62%	148.90%	83.06%	-0.39%	291.82%	73.94%
Continuing Trading Firms	Partner Entry		-22.64%	-196.47%	151.77%	-0.48%	488.65%	78.58%
Continuing Trading Firms	Partner Exit		61.77%	188.48%	-53.09%	0.00%	-127.09%	-12.81%
Continuing Trading Firms	Continuing Partners		34.48%	156.88%	-15.62%	0.08%	-69.74%	8.18%
Continuing Trading Firms	Continuing Partners	Product Entry	0.00%	-24.85%	11.42%	0.00%	6.37%	10.79%
Continuing Trading Firms	Continuing Partners	Product Exit	0.03%	16.45%	-4.16%	0.00%	-16.68%	-0.01%
Continuing Trading Firms	Continuing Partners	Continuing Products	34.45%	165.28%	-22.89%	0.09%	-59.43%	-2.60%

Notes: This table displays the various margins that contributed to India, Mexico, and Vietnam's trade changes with Russia and Belarus for firms in the agriculture sector. A firm is defined to be in the agriculture sector if its mostly traded products fall within the Harmonized System (HS) 2-digit chapters 01-24, or 31. Based on Equations (4.1)-(4.3), a country's trade change with Russia and Belarus in the agriculture sector is decomposed into contributions by (1) trading firm entry/exit, (2) trade partner entry/exit for continuing trading firms, (3) product entry/exit for continuing trading firm-partner relationship, and (4) continuing supply chains.

Table A.15: Decomposition by Margins within Mining and Energy Sector

Trading Firm Status	Partner Status	Product Status	Export			Import		
			Mexico	Vietnam	India	Mexico	Vietnam	India
Trading Firm Entry			0.00%	116.95%	81.45%	0.00%	-54.89%	18.28%
Trading Firm Exit			100.00%	-16.95%	-0.94%	70.58%	37.18%	-0.33%
Continuing Trading Firms			0.00%	0.00%	19.50%	29.42%	117.72%	82.05%
Continuing Trading Firms	Partner Entry		0.00%	0.00%	62.49%	-26.31%	-342.75%	84.45%
Continuing Trading Firms	Partner Exit		0.00%	0.00%	-29.31%	0.00%	436.01%	-2.43%
Continuing Trading Firms	Continuing Partners		0.00%	0.00%	-13.69%	55.72%	24.46%	0.02%
Continuing Trading Firms	Continuing Partners	Product Entry	0.00%	0.00%	0.62%	0.00%	-12.92%	1.13%
Continuing Trading Firms	Continuing Partners	Product Exit	0.00%	0.00%	-0.03%	0.00%	6.45%	-0.15%
Continuing Trading Firms	Continuing Partners	Continuing Products	0.00%	0.00%	-14.29%	55.72%	30.93%	-0.96%

Notes: This table displays the various margins that contributed to India, Mexico, and Vietnam's trade changes with Russia and Belarus for firms in the mining and energy sector. A firm is classified to be in the mining and energy sector if its mostly traded products in the durable goods sector if its mostly traded products fall within the Harmonized System (HS) 2-digit chapters 25, 26, and 27. Based on Equations (4.1)-(4.3), a country's trade change with Russia and Belarus in the mining and energy sector is decomposed into contributions by (1) trading firm entry/exit, (2) trade partner entry/exit for continuing trading firms, (3) product entry/exit for continuing trading firm-partner relationship, and (4) continuing supply chains.

Table A.16: Decomposition by Margins within Durable Goods Sector

Trading Firm Status	Partner Status	Product Status	Export			Import		
			Mexico	Vietnam	India	Mexico	Vietnam	India
Trading Firm Entry			-9.12%	-20.75%	-83.58%	-280.86%	-24.07%	-45.55%
Trading Firm Exit			6.28%	10.20%	17.26%	436.50%	39.47%	41.52%
Continuing Trading Firms			102.84%	110.55%	166.32%	-55.65%	84.60%	104.03%
Continuing Trading Firms	Partner Entry		-17.02%	-23.16%	-84.39%	-113.00%	-27.87%	-131.81%
Continuing Trading Firms	Partner Exit		88.21%	16.55%	143.47%	54.71%	84.75%	127.07%
Continuing Trading Firms	Continuing Partners		31.65%	117.16%	107.25%	2.65%	27.72%	108.77%
Continuing Trading Firms	Continuing Partners	Product Entry	-3.17%	-8.75%	-20.43%	-28.93%	-6.45%	-16.71%
Continuing Trading Firms	Continuing Partners	Product Exit	4.45%	4.68%	81.73%	32.01%	13.00%	9.56%
Continuing Trading Firms	Continuing Partners	Continuing Products	30.37%	121.23%	45.95%	-0.43%	21.17%	115.92%

Notes: This table displays the various margins that contributed to India, Mexico, and Vietnam's trade changes with Russia and Belarus for firms in the durable goods sector. A firm is classified to be in the durable goods sector if its mostly traded products fall within the Harmonized System (HS) 2-digit chapters 44-46, 68-76, or 78-97. Based on Equations (4.1)-(4.3), a country's trade change with Russia and Belarus in the durable goods sector is decomposed into contributions by (1) trading firm entry/exit, (2) trade partner entry/exit for continuing trading firms, (3) product entry/exit for continuing trading firm-partner relationship, and (4) continuing supply chains.

Table A.17: Decomposition by Margins within Non-durable Goods Sector

Trading Firm Status	Partner Status	Product Status	Export			Import		
			Mexico	Vietnam	India	Mexico	Vietnam	India
Trading Firm Entry			-32.29%	261.84%	78.51%	-3.33%	-66.29%	47.41%
Trading Firm Exit			16.90%	-82.30%	-15.03%	30.07%	52.52%	-20.63%
Continuing Trading Firms			115.39%	-79.54%	36.53%	73.26%	113.77%	73.22%
Continuing Trading Firms	Partner Entry		-33.46%	238.58%	111.79%	-12.23%	-73.20%	232.60%
Continuing Trading Firms	Partner Exit		30.65%	-82.19%	-60.45%	8.34%	99.79%	-41.72%
Continuing Trading Firms	Continuing Partners		118.19%	-235.94%	-14.81%	77.15%	87.19%	-117.66%
Continuing Trading Firms	Continuing Partners	Product Entry	-0.01%	107.65%	32.27%	-0.01%	-8.89%	12.09%
Continuing Trading Firms	Continuing Partners	Product Exit	0.10%	-100.80%	-16.48%	2.19%	8.61%	-22.04%
Continuing Trading Firms	Continuing Partners	Continuing Products	118.10%	-242.79%	-30.60%	74.97%	87.46%	-107.71%

Notes: This table displays the various margins that contributed to India, Mexico, and Vietnam's trade changes with Russia and Belarus for firms in the non-durable goods sector. A firm is classified to be in the non-durable goods sector if its mostly traded products fall within the Harmonized System (HS) 2-digit chapters 28-30, 32-43, and 47-67. Based on Equations (4.1)-(4.3), a country's trade change with Russia and Belarus in the non-durable goods sector is decomposed into contributions by (1) trading firm entry/exit, (2) trade partner entry/exit for continuing trading firms, (3) product entry/exit for continuing trading firm-partner relationship, and (4) continuing supply chains.

Appendix B Additional Tables and Figures: Empirical Analysis

Table B.1: Effects of Sanctions on Imports from Russia and Belarus (Firm - Product Level)

	(1)	(2)	(3)	(4)
	IHS(Import from Russia-Belarus)			
$\text{Post}_t \times \text{SP}_p$	-0.0212***	-0.0250***	-0.0148***	-0.0145
	(0.0030)	(0.0042)	(0.0037)	(0.0138)
R^2	0.483	0.485	0.458	0.486
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	1813339	1175570	557447	80322

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Figure B.1: Effects of Sanctions on Imports from Russia/Belarus (Firm-Product Level)
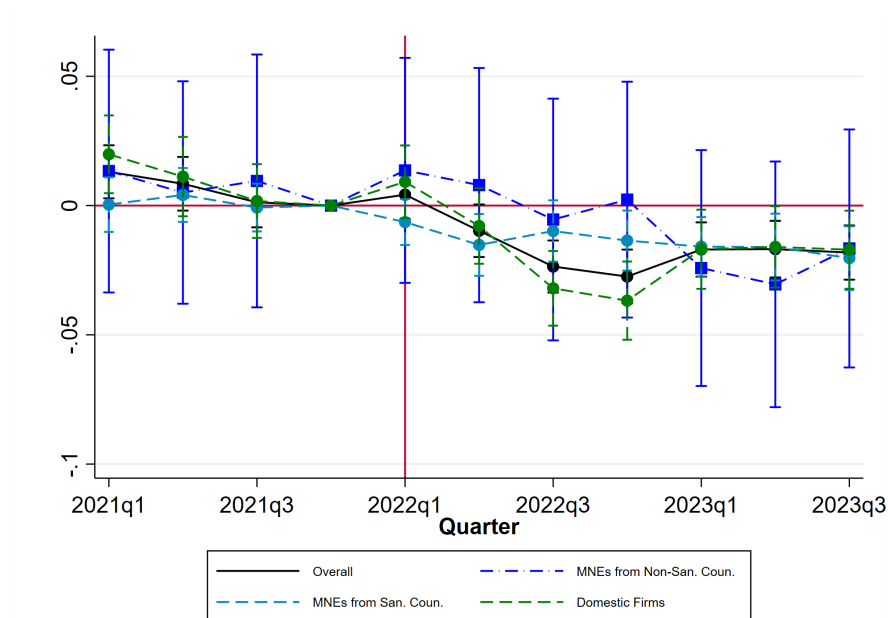
Notes: Figure displays the coefficients and 95% confidence interval from Equation (5.8) for each sample indicated by the legend. The vertical red line refers to the first quarter of 2022 when the Russo-Ukrainian war broke out. Standard errors are clustered at the firm-product (ip) level. The quarter prior to the war (2021q4) is the omitted reference quarter.

Table B.2: Effects of Sanctions on Imports from Russia and Belarus (Product Level)

	(1)	(2)	(3)	(4)	(5)
	IHS(Import from Russia-Belarus)				
$\text{Post}_t \times \text{Multi}_m \times \text{SP}_p$	0.1277	0.2161*			
	(0.1204)	(0.1212)			
$\text{Post}_t \times \text{Multi Sanc}_m \times \text{SP}_p$		-0.1767*	0.0394	0.0394	0.0394
		(0.0901)	(0.1355)	(0.1355)	(0.1355)
$\text{Post}_t \times \text{Multi No-Sanc}_m \times \text{SP}_p$			0.2161*	0.2161*	0.2161*
			(0.1212)	(0.1212)	(0.1212)
$\text{Post}_t \times \text{Multi Sanc}_m$			1.1825**		
			(0.5044)		
$\text{Post}_t \times \text{Multi No-Sanc}_m$			0.8855*		
			(0.4582)		
$\text{Post}_t \times \text{Sanction Product}_p$				-0.3189***	
				(0.1148)	
$\text{Post}_t \times \text{Skill Intensity}_p$				-0.0378	
				(0.1586)	
$\text{Post}_t \times \text{Capital Intensity}_p$				0.1068	
				(0.0657)	
$\text{Post}_t \times \text{Advanced Technology}_p$				0.0064	
				(0.1494)	
R^2	0.757	0.757	0.756	0.626	0.757
Product x MNEs Status FE	✓	✓	✓	✓	✓
MNEs Status x Quarter FE	✓	✓	-	✓	✓
Product x Quarter FE	✓	✓	✓	-	✓
Controls	✓	✓	✓	✓	✓
Observations	65769	65769	65769	65769	65769

Notes: Table reports the regression results of Equation (5.1) where the dependent variable is the value of imports of products p from Russia and Belarus to India, Mexico, Vietnam. Column (1) controls for $Post_t \times X_p \times Multi_m$. Column (2) controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$. Column (3)-(5) control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.3: Effects of Sanctions on Imports to Russia and Belarus (Firm-Product Level)

	(1)	(2)	(3)	(4)	(5)
	IHS(Import from Russia-Belarus)				
$\text{Post}_t \times \text{Multi}_i \times \text{SP}_p$	-0.0045	0.0041			
	(0.0053)	(0.0140)			
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{SP}_p$		-0.0098	-0.0008	0.0101*	-0.0057
		(0.0139)	(0.0056)	(0.0056)	(0.0053)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{SP}_p$			0.0077	0.0104	0.0041
			(0.0149)	(0.0145)	(0.0140)
$\text{Post}_t \times \text{Multi Sanc}_i$			0.0305		
			(0.0250)		
$\text{Post}_t \times \text{Multi No-Sanc}_i$			-0.0263		
			(0.0620)		
$\text{Post}_t \times \text{SP}_p$				-0.0250***	
				(0.0042)	
$\text{Post}_t \times \text{Capital Intensity}_p$				-0.0178***	
				(0.0037)	
$\text{Post}_t \times \text{Skill Intensity}_p$				0.0230***	
				(0.0077)	
$\text{Post}_t \times \text{Advanced Technology}_p$				-0.0051	
				(0.0053)	
R^2	0.505	0.505	0.432	0.483	0.505
Firm x Product FE	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	-	✓	✓
Country x Quarter FE	-	-	✓	-	-
Product x Quarter FE	✓	✓	✓	-	✓
Controls	✓	✓	✓	✓	✓
Observations	1812635	1812635	1818905	1813339	1812635

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of imports of products p from Russia and Belarus to India, Mexico, or Vietnam. Column (1) controls for $Post_t \times X_p \times Multi_m$. Column (2) controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$. Column (3)-(5) control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.4: Effects of Sanctions on Exports to Russia and Belarus (Supply Chain Level)

	(1)	(2)	(3)	(4)	(5)
	IHS(Export to Russia-Belarus)				
$Post_t \times Multi_i \times SP_p$	-0.0279***	0.0170			
	(0.0064)	(0.0136)			
$Post_t \times Multi\ Sanc_i \times SP_p$		-0.0509***	-0.0356***	-0.0338***	-0.0339***
		(0.0144)	(0.0067)	(0.0067)	(0.0068)
$Post_t \times Multi\ No\text{-}Sanc_i \times SP_p$			0.0087	0.0181	0.0170
			(0.0178)	(0.0135)	(0.0136)
$Post_t \times Multi\ Sanc_i$			0.0472*		
			(0.0272)		
$Post_t \times Multi\ No\text{-}Sanc_i$			-0.0870		
			(0.0822)		
$Post_t \times SP_p$				0.0117***	
				(0.0031)	
$Post_t \times Capital\ Intensity_p$				-0.0036	
				(0.0024)	
$Post_t \times Skill\ Intensity_p$				0.0039	
				(0.0053)	
$Post_t \times Advanced\ Technology_p$				-0.0072	
				(0.0045)	
R^2	0.644	0.644	0.620	0.642	0.644
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	-	✓	✓
Country Firm x Quarter FE	-	-	✓	-	-
Foreign Firm x Product FE	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	-	✓
Controls	✓	✓	✓	✓	✓
Observations	2612907	2612907	2612918	2612907	2612907

Notes: Table reports the regression results of Equation (7.1) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Column (1) controls for $Post_t \times X_p \times Multi_m$. Column (2) controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$. Column (3)-(5) control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the domestic firm $\times$ Russian/Belarusian firm $\times$ product level $(i-j-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.5: Effects of Sanctions on Imports from Russia and Belarus (Supply Chain Level)

	(1)	(2)	(3)	(4)	(5)
	IHS(Import from Russia-Belarus)				
$\text{Post}_t \times \text{Multi}_i \times \text{SP}_p$	-0.0022	0.0005			
	(0.0014)	(0.0036)			
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{SP}_p$		-0.0030	-0.0032**	-0.0016	-0.0026*
		(0.0035)	(0.0015)	(0.0015)	(0.0014)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{SP}_p$			0.0008	0.0003	0.0005
			(0.0036)	(0.0036)	(0.0036)
$\text{Post}_t \times \text{Multi Sanc}_i$			0.0074		
			(0.0063)		
$\text{Post}_t \times \text{Multi No-Sanc}_i$			0.0163		
			(0.0136)		
$\text{Post}_t \times \text{SP}_p$				0.0002	
				(0.0011)	
$\text{Post}_t \times \text{Capital Intensity}_p$				0.0004	
				(0.0009)	
$\text{Post}_t \times \text{Skill Intensity}_p$				-0.0024	
				(0.0019)	
$\text{Post}_t \times \text{Advanced Technology}_p$				0.0015	
				(0.0015)	
R^2	0.632	0.632	0.611	0.629	0.632
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	-	✓	✓
Country Firm x Quarter FE	-	-	✓	-	-
Foreign Firm x Product FE	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	-	✓
Controls	✓	✓	✓	✓	✓
Observations	3730958	3730958	3730958	3730958	3730958

Notes: Table reports the regression results of Equation (7.1) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam from Russia and Belarus. Column (1) controls for $Post_t \times X_p \times Multi_m$. Column (2) controls for $Post_t \times X_p \times Multi_m$ and $Post_t \times X_p \times Multi\ Sanc_m$. Column (3)-(5) control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the domestic firm $\times$ Russian/Belarusian firm $\times$ product level ($i - j - p$). *** p<0.01, ** p<0.05, * p<0.1.

Table B.6: Effects of Sanctions on Exports to Russia and Belarus (Supply Chain Level)

	(1)	(2)	(3)	(4)
	IHS(Export to Russia-Belarus)			
$\text{Post}_t \times \text{SP}_p$	0.0058**	0.0111***	-0.0144***	0.0104
	(0.0027)	(0.0031)	(0.0053)	(0.0112)
R^2	0.642	0.634	0.750	0.734
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	✓	✓
Foreign Firm x Product FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	2612907	2136607	417593	55462

Notes: Table reports the regression results of Equation (7.2) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the domestic firm × Russian/Belarusian firm × product level $(i - j - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.7: Effects of Sanctions on Imports from Russia and Belarus (Supply Chain Level)

	(1)	(2)	(3)	(4)
	IHS(Import from Russia-Belarus)			
$\text{Post}_t \times \text{SP}_p$	-0.0003	-0.0000	-0.0016***	0.0002
	(0.0008)	(0.0011)	(0.0006)	(0.0027)
R^2	0.629	0.623	0.758	0.694
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	✓	✓
Foreign Firm x Product FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	3730958	2444123	1122660	162987

Notes: Table reports the regression results of Equation (7.2) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the domestic firm × Russian/Belarusian firm × product level $(i - j - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.8: Effects of Sanctions on Exports to CIS and SPFS Countries (Supply Chain Level)

	(1)	(2)	(3)	(4)
	IHS(Export to CIS + SPFS Countries)			
$Post_t \times SP_p$	0.0006*	0.0003	0.0017**	-0.0019
	(0.0003)	(0.0003)	(0.0008)	(0.0020)
R^2	0.618	0.604	0.679	0.748
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	✓	✓
Foreign Firm x Product FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	12950509	10459504	2200440	288057

Notes: Table reports the regression results of Equation (7.2) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to CIS and SPFS countries. Controls include $Post_t \times$Capital Intensity$_p$, $Post_t \times$Skill Intensity$_p$, and $Post_t \times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the domestic firm $\times$ Russian/Belarusian firm $\times$ product level $(i - j - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.9: Effects of Sanctions on Imports from CIS and SPFS Countries (Supply Chain Level)

	(1)	(2)	(3)	(4)
	IHS(Import from CIS + SPFS Countries)			
$Post_t \times SP_p$	-0.0002	-0.0001	-0.0001	-0.0008***
	(0.0001)	(0.0001)	(0.0002)	(0.0003)
R^2	0.693	0.688	0.716	0.658
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	✓	✓
Foreign Firm x Product FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	20105635	13051555	6166699	886028

Notes: Table reports the regression results of Equation (7.2) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam from CIS and SPFS countries. Controls include $Post_t \times$Capital Intensity$_p$, $Post_t \times$Skill Intensity$_p$, and $Post_t \times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the domestic firm $\times$ Russian/Belarusian firm $\times$ product level $(i - j - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.10: Extensive Margin Effects of Sanctions on Exports to Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
		I(Export to Russia-Belarus)		
$\text{Post}_t \times \text{SP}_p$	0.0018	0.0430***	-0.0416***	0.0040
	(0.0059)	(0.0134)	(0.0100)	(0.0047)
R^2	0.226	0.605	0.578	0.527
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	66330	22110	22110	22110

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the indicator of exporting non-zero amount of products p in India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.11: Extensive Margin Effects of Sanctions on Imports from Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
		I(Import from Russia-Belarus)		
$\text{Post}_t \times \text{SP}_p$	-0.0215***	-0.0252**	-0.0315***	-0.0079*
	(0.0049)	(0.0107)	(0.0079)	(0.0046)
R^2	0.264	0.560	0.476	0.387
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	65769	21923	21923	21923

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the indicator of importing non-zero amount of products p in India, Mexico, or Vietnam from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.12: Extensive Margin Effects of Sanctions on Exports to Russia/Belarus (Firm-Product)

	(1)	(2)	(3)	(4)
		I(Export to Russia-Belarus)		
$\text{Post}_t \times \text{SP}_p$	0.0009	0.0028***	-0.0076***	0.0054
	(0.0008)	(0.0009)	(0.0020)	(0.0039)
R^2	0.556	0.560	0.521	0.570
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	1153218	929874	197571	25773

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the indicator of exporting non-zero amount of product p from India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.13: Extensive Margin Effects of Sanctions on Imports from Russia/Belarus (Firm-Product)

	(1)	(2)	(3)	(4)
		I(Import from Russia-Belarus)		
$\text{Post}_t \times \text{SP}_p$	-0.0018***	-0.0019***	-0.0017***	-0.0008
	(0.0003)	(0.0004)	(0.0004)	(0.0013)
R^2	0.450	0.458	0.386	0.447
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	1813339	1175570	557447	80322

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the indicator of importing non-zero amount of product p to India, Mexico, or Vietnam from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.14: Intensive Margin Effects of Sanctions on Exports to Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
		log(Export to Russia-Belarus)		
$\text{Post}_t \times \text{SP}_p$	0.0220	0.2224**	-0.4839	0.0012
	(0.1212)	(0.1124)	(0.3196)	(0.3370)
R^2	0.581	0.719	0.719	0.807
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	11592	8987	1901	485

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the log value of exporting of products p in India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.15: Intensive Margin Effects of Sanctions on Imports from Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
		log(Import from Russia-Belarus)		
$\text{Post}_t \times \text{SP}_p$	-0.1810	-0.0055	-0.7058*	-0.8232*
	(0.1531)	(0.1781)	(0.4004)	(0.4904)
R^2	0.621	0.720	0.726	0.775
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	5493	3993	992	296

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the log value of importing of products p in India, Mexico, or Vietnam from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.16: Intensive Margin Effects of Sanctions on Exports to Russia/Belarus (Firm-Product)

	(1)	(2)	(3)	(4)
	log(Export to Russia-Belarus)			
$\text{Post}_t \times \text{SP}_p$	0.0722	0.1125	0.0503	-0.5201***
	(0.0914)	(0.1043)	(0.1841)	(0.1609)
R^2	0.899	0.890	0.926	0.906
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	21039	18191	2556	292

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the log value of exporting of product p from India, Mexico, or Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times$Capital Intensity$_p$, $\text{Post}_t \times$Skill Intensity$_p$, and $\text{Post}_t \times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the Firm$\times$Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.17: Intensive Margin Effects of Sanctions on Imports from Russia/Belarus (Firm-Product)

	(1)	(2)	(3)	(4)
	log(Import from Russia-Belarus)			
$\text{Post}_t \times \text{SP}_p$	0.2530	0.3764	-0.4893	-0.3725
	(0.2667)	(0.3002)	(0.6246)	(0.9370)
R^2	0.902	0.900	0.939	0.838
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	4575	3840	581	154

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the log value of importing of product p to India, Mexico, or Vietnam from Russia and Belarus. Controls include $\text{Post}_t \times$Capital Intensity$_p$, $\text{Post}_t \times$Skill Intensity$_p$, and $\text{Post}_t \times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the Firm$\times$Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.18: Effects of Sanctions on Exports to Russia and Belarus (Product Level - All Product Level Controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	IHS(Export to Russia-Belarus)									
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{SP}_p$	-0.6749***	-0.9290***	-1.1187***	-0.9976***	-0.9267***	-0.9731***	-1.0231***	-0.9966***	-1.0089***	-0.6419***
	(0.1757)	(0.1718)	(0.1801)	(0.1741)	(0.1919)	(0.1734)	(0.1829)	(0.1732)	(0.1879)	(0.2014)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{SP}_p$	-0.2822*	-0.2937**	-0.5538***	-0.3740**	-0.5349***	-0.3459**	-0.5103***	-0.3698**	-0.5393***	-0.5384***
	(0.1467)	(0.1470)	(0.1552)	(0.1476)	(0.1677)	(0.1485)	(0.1591)	(0.1473)	(0.1629)	(0.1732)
$\text{Post}_t \times \text{Export}_{p,2021}^{World}$	-0.0977***									-0.0995***
	(0.0139)									(0.0138)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Skill Intensity}_p$		-0.9255***								-0.9175***
		(0.1870)								(0.2829)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Skill Intensity}_p$		-1.0087***								-0.9865***
		(0.1661)								(0.2646)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Capital Intensity}_p$			-0.3241***							-0.3879***
			(0.0964)							(0.1380)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Capital Intensity}_p$			-0.4842***							-0.2218*
			(0.0866)							(0.1284)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Advanced Technology}_p$				-0.2752						0.2633
				(0.1802)						(0.2828)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Advanced Technology}_p$				-0.4392***						-0.0563
				(0.1532)						(0.2046)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Contract Intensity}_p$					-0.3644					-0.7705
					(0.4577)					(0.6174)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Contract Intensity}_p$					1.0768***					0.5877
					(0.3909)					(0.5510)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{External Finance Dependence}_p$						-0.1740				-0.1760
						(0.1599)				(0.2018)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{External Finance Dependence}_p$						-0.1389				-0.1636
						(0.1473)				(0.1810)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Asset Tangibility}_p$							-0.5379			-1.4427
							(0.7650)			(1.2808)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Asset Tangibility}_p$							-2.2785***			-1.9078
							(0.6820)			(1.1839)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Trade Credit Intensity}_p$								3.4389		-4.7253*
								(2.1356)		(2.7039)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Trade Credit Intensity}_p$								4.6012**		-2.1649
								(1.9119)		(2.3532)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Inventory Ratio}_p$									0.8754	-2.8480
									(2.8340)	(3.8314)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Inventory Ratio}_p$									7.2745***	0.7020
									(2.4991)	(3.2093)
R^2	0.827	0.827	0.826	0.826	0.826	0.826	0.826	0.826	0.826	0.828
Product x MNEs Status FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MNEs Status x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	66330	66330	66330	66330	66330	66330	66330	66330	66330	66330

Notes: Table reports the regression results of Equation (5.1) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Standard errors (in parentheses) are clustered at the Product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.19: Effects of Sanctions on Imports from Russia and Belarus (Product Level - All Product Level Controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	IHS(Import from Russia-Belarus)									
$Post_t \times$ Multi Sanc$_i \times$ SP$_p$	0.1231	0.1246	0.0269	0.1187	-0.0656	0.1033	0.0629	0.1274	0.1009	0.0359
	(0.1299)	(0.1306)	(0.1321)	(0.1298)	(0.1413)	(0.1304)	(0.1381)	(0.1295)	(0.1435)	(0.1544)
$Post_t \times$ Multi No-Sanc$_i \times$ SP$_p$	0.2679**	0.2628**	0.2179*	0.2660**	0.2233*	0.2533**	0.2202*	0.2775**	0.2778**	0.3308**
	(0.1144)	(0.1161)	(0.1180)	(0.1139)	(0.1285)	(0.1150)	(0.1253)	(0.1140)	(0.1323)	(0.1391)
$Post_t \times$ Import$^{World}_{p,2021}$	-0.0116*									-0.0147**
	(0.0064)									(0.0066)
$Post_t \times$ Multi Sanc$_i \times$ Skill Intensity$_p$		-0.1117								-0.3557
		(0.1306)								(0.2381)
$Post_t \times$ Multi No-Sanc$_i \times$ Skill Intensity$_p$		0.0201								-0.2272
		(0.1278)								(0.2157)
$Post_t \times$ Multi Sanc$_i \times$ Capital Intensity$_p$			-0.2214***							-0.1724
			(0.0714)							(0.1232)
$Post_t \times$ Multi No-Sanc$_i \times$ Capital Intensity$_p$			-0.1127*							-0.1746
			(0.0656)							(0.1090)
$Post_t \times$ Multi Sanc$_i \times$ Advanced Technology$_p$				0.0341						0.0175
				(0.1318)						(0.1837)
$Post_t \times$ Multi No-Sanc$_i \times$ Advanced Technology$_p$				0.0591						0.0513
				(0.1248)						(0.1624)
$Post_t \times$ Multi Sanc$_i \times$ Contract Intensity$_p$					1.1075***					1.0166*
					(0.3413)					(0.5290)
$Post_t \times$ Multi No-Sanc$_i \times$ Contract Intensity$_p$					0.2465					-0.3616
					(0.3129)					(0.4450)
$Post_t \times$ Multi Sanc$_i \times$ External Finance Dependence$_p$						0.1714				0.1556
						(0.1184)				(0.1462)
$Post_t \times$ Multi No-Sanc$_i \times$ External Finance Dependence$_p$						0.1294				0.0565
						(0.1118)				(0.1354)
$Post_t \times$ Multi Sanc$_i \times$ Asset Tangibility$_p$							-0.8422			1.2116
							(0.6180)			(1.0907)
$Post_t \times$ Multi No-Sanc$_i \times$ Asset Tangibility$_p$							-0.6750			-0.1552
							(0.5999)			(0.9895)
$Post_t \times$ Multi Sanc$_i \times$ Trade Credit Intensity$_p$								-3.5034***		-5.5801***
								(1.2942)		(2.1357)
$Post_t \times$ Multi No-Sanc$_i \times$ Trade Credit Intensity$_p$								-4.7833***		-6.2778***
								(1.3665)		(2.0854)
$Post_t \times$ Multi Sanc$_i \times$ Inventory Ratio$_p$									0.6741	-1.8488
									(2.0947)	(2.7743)
$Post_t \times$ Multi No-Sanc$_i \times$ Inventory Ratio$_p$									-0.5595	-2.2125
									(2.1012)	(2.5821)
R^2	0.757	0.756	0.757	0.756	0.757	0.757	0.757	0.757	0.756	0.757
Product x MNEs Status FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
MNEs Status x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	65769	65769	65769	65769	65769	65769	65769	65769	65769	65769

Notes: Table reports the regression results of Equation (5.1) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Standard errors (in parentheses) are clustered at the Product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.20: Effects of Sanctions on Exports to Russia and Belarus (Firm-Product Level - All Product Level Controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
					IHS(Export to Russia-Belarus)					
$Post_t \times$ Multi Sanc$_i \times SP_p$	-0.0899***	-0.1157***	-0.1146***	-0.1224***	-0.0907***	-0.1199***	-0.1063***	-0.1095***	-0.1154***	-0.0741***
	(0.0200)	(0.0209)	(0.0205)	(0.0215)	(0.0216)	(0.0220)	(0.0218)	(0.0203)	(0.0228)	(0.0239)
$Post_t \times$ Multi No-Sanc$_i \times SP_p$	-0.0036	0.0202	0.0079	-0.0022	0.0263	-0.0131	0.0097	0.0029	0.0184	0.0279
	(0.0418)	(0.0428)	(0.0433)	(0.0441)	(0.0467)	(0.0439)	(0.0451)	(0.0419)	(0.0460)	(0.0475)
$Post_t \times \text{Export}^{World}_{ip,2021}$	-0.0259***									-0.0258***
	(0.0011)									(0.0011)
$Post_t \times$ Multi Sanc$_i \times$ Skill Intensity$_p$		0.0251								-0.0252
		(0.0262)								(0.0358)
$Post_t \times$ Multi No-Sanc$_i \times$ Skill Intensity$_p$		-0.1214**								-0.1976**
		(0.0557)								(0.0870)
$Post_t \times$ Multi Sanc$_i \times$ Capital Intensity$_p$			-0.0210							-0.0385**
			(0.0145)							(0.0177)
$Post_t \times$ Multi No-Sanc$_i \times$ Capital Intensity$_p$			0.0264							0.0200
			(0.0288)							(0.0386)
$Post_t \times$ Multi Sanc$_i \times$ Advanced Technology$_p$				0.0539***						0.0534*
				(0.0207)						(0.0305)
$Post_t \times$ Multi No-Sanc$_i \times$ Advanced Technology$_p$				0.0195						0.0770
				(0.0354)						(0.0578)
$Post_t \times$ Multi Sanc$_i \times$ Contract Intensity$_p$					-0.1644***					-0.2470***
					(0.0540)					(0.0740)
$Post_t \times$ Multi No-Sanc$_i \times$ Contract Intensity$_p$					-0.2072**					-0.2133
					(0.1019)					(0.1553)
$Post_t \times$ Multi Sanc$_i \times$ External Finance Dependence$_p$						0.0460*				0.0454
						(0.0242)				(0.0296)
$Post_t \times$ Multi No-Sanc$_i \times$ External Finance Dependence$_p$						0.0840**				0.1380***
						(0.0388)				(0.0484)
$Post_t \times$ Multi Sanc$_i \times$ Asset Tangibility$_p$							0.0567			0.1672
							(0.0935)			(0.1342)
$Post_t \times$ Multi No-Sanc$_i \times$ Asset Tangibility$_p$							0.1196			-0.0433
							(0.1710)			(0.2956)
$Post_t \times$ Multi Sanc$_i \times$ Trade Credit Intensity$_p$								-1.4146***		-1.4992***
								(0.3526)		(0.4204)
$Post_t \times$ Multi No-Sanc$_i \times$ Trade Credit Intensity$_p$								0.6354		0.4783
								(0.7469)		(0.8490)
$Post_t \times$ Multi Sanc$_i \times$ Inventory Ratio$_p$									0.1757	0.1449
									(0.3258)	(0.3998)
$Post_t \times$ Multi No-Sanc$_i \times$ Inventory Ratio$_p$									-0.6637	-0.3014
									(0.5587)	(0.6764)
R^2	0.618	0.617	0.617	0.617	0.617	0.617	0.617	0.617	0.617	0.618
Firm x Product FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	1152745	1152745	1152745	1152745	1152745	1152745	1152745	1152745	1152745	1152745

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Standard errors (in parentheses) are clustered at the Firm×Product level $(i - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.21: Effects of Sanctions on Imports from Russia and Belarus (Firm-Product Level - All Product Level Controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	IHS(Import from Russia-Belarus)									
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{SP}_p$	-0.0014	-0.0045	-0.0055	-0.0050	-0.0074	-0.0090	-0.0039	-0.0042	-0.0022	-0.0026
	(0.0050)	(0.0052)	(0.0051)	(0.0051)	(0.0059)	(0.0055)	(0.0060)	(0.0050)	(0.0060)	(0.0070)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{SP}_p$	0.0075	0.0040	0.0064	0.0041	0.0119	0.0003	0.0057	0.0069	0.0078	0.0141
	(0.0117)	(0.0131)	(0.0128)	(0.0126)	(0.0146)	(0.0123)	(0.0152)	(0.0116)	(0.0154)	(0.0170)
$\text{Post}_t \times \text{Import}_{ip,2021}^{World}$	-0.0085***									-0.0085***
	(0.0004)									(0.0004)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Skill Intensity}_p$		0.0007								-0.0036
		(0.0073)								(0.0095)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Skill Intensity}_p$		0.0136								0.0034
		(0.0180)								(0.0234)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Capital Intensity}_p$			-0.0041							-0.0038
			(0.0045)							(0.0051)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Capital Intensity}_p$			0.0009							-0.0070
			(0.0104)							(0.0108)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Advanced Technology}_p$				0.0034						-0.0048
				(0.0055)						(0.0079)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Advanced Technology}_p$				0.0124						0.0036
				(0.0124)						(0.0158)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Contract Intensity}_p$					0.0209					0.0309
					(0.0185)					(0.0238)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Contract Intensity}_p$					-0.0404					-0.0977**
					(0.0375)					(0.0455)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{External Finance Dependence}_p$						0.0201***				0.0242***
						(0.0077)				(0.0093)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{External Finance Dependence}_p$						0.0274*				0.0315
						(0.0156)				(0.0201)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Asset Tangibility}_p$							0.0051			0.0513
							(0.0294)			(0.0444)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Asset Tangibility}_p$							-0.0058			-0.0085
							(0.0847)			(0.1111)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Trade Credit Intensity}_p$								-0.0522		0.0278
								(0.0927)		(0.1192)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Trade Credit Intensity}_p$								-0.3340		-0.2831
								(0.2838)		(0.3528)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Inventory Ratio}_p$									-0.0763	-0.1535
									(0.0966)	(0.1122)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Inventory Ratio}_p$									-0.0612	-0.0991
									(0.2823)	(0.2914)
R^2	0.506	0.505	0.505	0.505	0.505	0.505	0.505	0.505	0.505	0.506
Firm x Product FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	1812635	1812635	1812635	1812635	1812635	1812635	1812635	1812635	1812635	1812635

Notes: Table reports the regression results of Equation (5.5) the dependent variable is the value of imports of products p in India, Mexico, or Vietnam to Russia and Belarus. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.22: Effects of Sanctions on Exports to Russia and Belarus (Supply Chain Level - All Product Level Controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	IHS(Export to Russia-Belarus)									
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{SP}_p$	-0.0270***	-0.0320***	-0.0323***	-0.0351***	-0.0251***	-0.0352***	-0.0330***	-0.0309***	-0.0350***	-0.0285***
	(0.0062)	(0.0066)	(0.0063)	(0.0067)	(0.0067)	(0.0069)	(0.0068)	(0.0062)	(0.0070)	(0.0075)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{SP}_p$	0.0082	0.0130	0.0144	0.0105	0.0203	0.0064	0.0112	0.0092	0.0162	0.0214
	(0.0122)	(0.0133)	(0.0126)	(0.0127)	(0.0131)	(0.0127)	(0.0123)	(0.0122)	(0.0125)	(0.0131)
$\text{Post}_t \times \text{Export}^{World}_{ip,2021}$	-0.0053***									-0.0053***
	(0.0003)									(0.0003)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Skill Intensity}_p$		0.0041								-0.0156
		(0.0082)								(0.0110)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Skill Intensity}_p$		-0.0236								-0.0396
		(0.0216)								(0.0290)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Capital Intensity}_p$			-0.0061							-0.0078
			(0.0044)							(0.0055)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Capital Intensity}_p$			0.0199**							0.0166
			(0.0101)							(0.0126)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Advanced Technology}_p$				0.0184***						0.0242***
				(0.0062)						(0.0092)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Advanced Technology}_p$				-0.0053						0.0049
				(0.0121)						(0.0188)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Contract Intensity}_p$					-0.0513***					-0.1040***
					(0.0159)					(0.0218)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Contract Intensity}_p$					-0.0897***					-0.0884**
					(0.0337)					(0.0449)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{External Finance Dependence}_p$						0.0204**				0.0200*
						(0.0089)				(0.0107)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{External Finance Dependence}_p$						0.0184				0.0275
						(0.0162)				(0.0189)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Asset Tangibility}_p$							-0.0252			-0.0474
							(0.0293)			(0.0416)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Asset Tangibility}_p$							0.0241			-0.0718
							(0.0635)			(0.1104)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Trade Credit Intensity}_p$								-0.1969*		-0.0432
								(0.1040)		(0.1234)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Trade Credit Intensity}_p$								-0.2707		-0.3938
								(0.2230)		(0.2584)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Inventory Ratio}_p$									0.1429	0.0980
									(0.0958)	(0.1167)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Inventory Ratio}_p$									-0.2613	-0.1113
									(0.1619)	(0.2086)
R^2	0.644	0.644	0.644	0.644	0.644	0.644	0.644	0.644	0.644	0.644
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Foreign Firm x Product FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	2612907	2612907	2612907	2612907	2612907	2612907	2612907	2612907	2612907	2612907

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Standard errors (in parentheses) are clustered at the Domestic Firm×Foreign Firm×Product level $(i-j-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.23: Effects of Sanctions on Imports from Russia and Belarus (Supply Chain Level - All Product Level Controls)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	IHS(Import from Russia-Belarus)									
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{SP}_p$	-0.0018	-0.0024*	-0.0025*	-0.0022	-0.0033**	-0.0017	-0.0024	-0.0022*	-0.0030*	-0.0027
	(0.0013)	(0.0014)	(0.0014)	(0.0014)	(0.0016)	(0.0015)	(0.0016)	(0.0013)	(0.0017)	(0.0020)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{SP}_p$	0.0012	0.0009	0.0004	0.0013	0.0003	0.0016	0.0008	0.0012	-0.0006	0.0015
	(0.0032)	(0.0034)	(0.0034)	(0.0033)	(0.0039)	(0.0033)	(0.0042)	(0.0031)	(0.0043)	(0.0042)
$\text{Post}_t \times \text{Import}_{ip,2021}^{World}$	-0.0013***									-0.0013***
	(0.0001)									(0.0001)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Skill Intensity}_p$		0.0008								0.0022
		(0.0021)								(0.0027)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Skill Intensity}_p$		0.0007								0.0025
		(0.0043)								(0.0056)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Capital Intensity}_p$			-0.0009							-0.0003
			(0.0012)							(0.0013)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Capital Intensity}_p$			-0.0021							-0.0028
			(0.0024)							(0.0027)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Advanced Technology}_p$				-0.0004						-0.0017
				(0.0015)						(0.0021)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Advanced Technology}_p$				-0.0018						-0.0050
				(0.0031)						(0.0039)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Contract Intensity}_p$					0.0074					0.0122*
					(0.0055)					(0.0066)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Contract Intensity}_p$					0.0051					0.0033
					(0.0102)					(0.0126)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{External Finance Dependence}_p$						-0.0022				-0.0039
						(0.0021)				(0.0025)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{External Finance Dependence}_p$						-0.0027				-0.0035
						(0.0027)				(0.0040)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Asset Tangibility}_p$							-0.0021			0.0100
							(0.0083)			(0.0117)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Asset Tangibility}_p$							-0.0025			0.0307
							(0.0214)			(0.0242)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Trade Credit Intensity}_p$								-0.0004		0.0024
								(0.0276)		(0.0342)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Trade Credit Intensity}_p$								-0.0658		-0.0989
								(0.1011)		(0.1138)
$\text{Post}_t \times \text{Multi Sanc}_i \times \text{Inventory Ratio}_p$									0.0279	0.0278
									(0.0289)	(0.0321)
$\text{Post}_t \times \text{Multi No-Sanc}_i \times \text{Inventory Ratio}_p$									0.0635	0.0951
									(0.0755)	(0.0694)
R^2	0.632	0.632	0.632	0.632	0.632	0.632	0.632	0.632	0.632	0.632
Domestic Firm x Foreign Firm x Product FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Domestic Firm x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Foreign Firm x Product FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	3730958	3730958	3730958	3730958	3730958	3730958	3730958	3730958	3730958	3730958

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam to Russia and Belarus. Standard errors (in parentheses) are clustered at the Domestic Firm×Foreign Firm×Product level $(i - j - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.24: Effects of Sanctions on Exports to Russia and Belarus (Firm-Product Level - Trade Share and Advanced Economy Controls)

	(1)	(2)	(3)	(4)	(5)
	IHS(Export to Russia-Belarus)				
$Post_t \times SP_p \times$ Multi Sanc$_i$	-0.1173***	-0.1373***	-0.1122**	-0.1390**	-0.1853**
	(0.0219)	(0.0223)	(0.0439)	(0.0700)	(0.0736)
$Post_t \times SP_p \times$ Multi No-Sanc$_i$	0.0279	0.0183	0.0268	0.0191	0.0215
	(0.0450)	(0.0446)	(0.0520)	(0.0514)	(0.0552)
$Post_t \times SP_p \times$ San Exp Share$_{i,2021}$	-0.0458**				-0.0565**
	(0.0230)				(0.0255)
$Post_t \times SP_p \times$ San Imp Share$_{i,2021}$		0.0420*			0.0455*
		(0.0254)			(0.0258)
$Post_t \times SP_p \times$ Above Median GDP$_{i,2021}$			-0.0108		-0.0179
			(0.0452)		(0.0464)
$Post_t \times SP_p \times$ Advanced Economy$_i$				0.0178	0.0680
				(0.0665)	(0.0739)
R^2	0.619	0.624	0.617	0.617	0.624
Firm x Product FE	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	1128116	931953	1152745	1152745	927465

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. *San Exp Share$_{i,2021}$* measures firm i's export share from sanctioning countries in 2021. *San Imp Share$_{i,2021}$* measures firm i's import share from sanctioning countries in 2021. *Advanced Economy$_i$* is an indicator that equals 1 if the headquarter of the firm is an advanced economy. *Above Median GDP$_i$* is an indicator that equals 1 if the headquarter' GDP per capita is above the median of all headquarters countries in the sample. All columns control for $Post_t \times X_p \times$ *Multi Sanc$_m$* and $Post_t \times X_p \times$ *Multi No-Sanc$_m$*. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the Domestic Firm×Product level $(i - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.25: Effects of Sanctions on Imports from Russia and Belarus (Firm-Product Level - Trade Share and Advanced Economy Controls)

	(1)	(2)	(3)	(4)	(5)
	IHS(Import from Russia-Belarus)				
$Post_t \times SP_p \times$ Multi Sanc$_i$	-0.0084	-0.0058	-0.0024	0.0096	0.0102
	(0.0052)	(0.0051)	(0.0075)	(0.0154)	(0.0158)
$Post_t \times SP_p \times$ Multi No-Sanc$_i$	0.0000	0.0020	0.0058	0.0046	0.0011
	(0.0126)	(0.0141)	(0.0146)	(0.0142)	(0.0135)
$Post_t \times SP_p \times$ San Exp Share$_{i,2021}$	-0.0061				-0.0069
	(0.0080)				(0.0082)
$Post_t \times SP_p \times$ San Imp Share$_{i,2021}$		-0.0014			0.0053
		(0.0090)			(0.0085)
$Post_t \times SP_p \times$ Above Median GDP$_{i,2021}$			-0.0041		-0.0041
			(0.0073)		(0.0069)
$Post_t \times SP_p \times$ Advanced Economy$_i$				-0.0155	-0.0159
				(0.0149)	(0.0144)
R^2	0.493	0.506	0.505	0.505	0.493
Firm x Product FE	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	1654840	1805232	1812635	1812635	1654510

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam from Russia and Belarus. *San Exp Share$_{i,2021}$* measures firm i's export share from sanctioning countries in 2021. *San Imp Share$_{i,2021}$* measures firm i's import share from sanctioning countries in 2021. *Advanced Economy$_i$* is an indicator that equals 1 if the headquarter of the firm is an advanced economy. *Above Median GDP$_i$* is an indicator that equals 1 if the headquarter' GDP per capita is above the median of all headquarters countries in the sample. All columns control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the Domestic Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.26: Effects of Sanctions on Exports to Russia and Belarus (Firm-Product Level - HQ Finance System Development Controls)

	(1)	(2)	(3)	(4)	(5)
	IHS(Export to Russia-Belarus)				
$\text{Post}_t \times \text{SP}_p \times \text{Multi Sanc}_i$	-0.1338***	-0.1151***	-0.1350***	-0.1251***	-0.2099***
	(0.0282)	(0.0257)	(0.0308)	(0.0282)	(0.0607)
$\text{Post}_t \times \text{SP}_p \times \text{Multi No-Sanc}_i$	0.0531	0.0201	0.0675	0.0599	0.0784
	(0.0689)	(0.0833)	(0.0791)	(0.0718)	(0.1317)
$\text{Post}_t \times \text{SP}_p \times \text{Private Credit Ratio}_i$	0.0004				0.0058
	(0.0003)				(0.0037)
$\text{Post}_t \times \text{SP}_p \times \text{Debt Ratio}_i$		0.0001			-0.0003
		(0.0002)			(0.0004)
$\text{Post}_t \times \text{SP}_p \times \text{CB Asset Ratio}_i$			-0.0002		0.0035
			(0.0010)		(0.0025)
$\text{Post}_t \times \text{SP}_p \times \text{DM Asset Ratio}_i$				0.0003	-0.0054
				(0.0003)	(0.0039)
R^2	0.621	0.621	0.619	0.621	0.622
Firm x Product FE	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	1072775	1066263	1085623	1073270	1026795

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. *Private Credit Ratio$_i$* measures firm i's headquarter country's private credit by deposit money banks to GDP in 2021. *Debt Ratio$_i$* measures firm i's headquarter country's liquidity liabilities to GDP ratio in 2021. *CB Asset Ratio$_i$* measures firm i's headquarter country's central bank assets to GDP ratio in 2021. *DM Asset Ratio$_i$* measures firm i's headquarter country's deposit money bank assets to GDP ratio in 2021. All columns control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the Domestic Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.27: Effects of Sanctions on Imports from Russia and Belarus (Firm-Product Level - HQ Finance System Development Controls)

	(1)	(2)	(3)	(4)	(5)
	IHS(Export to Russia-Belarus)				
$Post_t \times SP_p \times$Multi Sanc$_i$	-0.0068	-0.0059	-0.0105	-0.0077	-0.0231*
	(0.0068)	(0.0071)	(0.0072)	(0.0074)	(0.0128)
$Post_t \times SP_p \times$Multi No-Sanc$_i$	0.0049	-0.0213	0.0196	0.0031	-0.0060
	(0.0197)	(0.0346)	(0.0216)	(0.0204)	(0.0435)
$Post_t \times SP_p \times$Private Credit Ratio$_i$	0.0001				0.0011
	(0.0001)				(0.0009)
$Post_t \times SP_p \times$Debt Ratio$_i$		0.0000			-0.0000
		(0.0000)			(0.0001)
$Post_t \times SP_p \times$CB Asset Ratio$_i$			0.0001		0.0007
			(0.0001)		(0.0005)
$Post_t \times SP_p \times$DM Asset Ratio$_i$				0.0001	-0.0009
				(0.0001)	(0.0009)
R^2	0.510	0.510	0.509	0.510	0.513
Firm x Product FE	✓	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓	✓
Product x Quarter FE	✓	✓	✓	✓	✓
Controls	✓	✓	✓	✓	✓
Observations	1600676	1572285	1586607	1601721	1438118

Notes: Table reports the regression results of Equation (5.5) where the dependent variable is the value of imports of products p from India, Mexico, or Vietnam to Russia and Belarus. *Private Credit Ratio$_i$* measures firm i's headquarter country's private credit by deposit money banks to GDP in 2021. *Debt Ratio$_i$* measures firm i's headquarter country's liquidity liabilities to GDP ratio in 2021. *CB Asset Ratio$_i$* measures firm i's headquarter country's central bank assets to GDP ratio in 2021. *DM Asset Ratio$_i$* measures firm i's headquarter country's deposit money bank assets to GDP ratio in 2021. All columns control for $Post_t \times X_p \times Multi\ Sanc_m$ and $Post_t \times X_p \times Multi\ No\text{-}Sanc_m$. X_p includes skill intensity, capital intensity, and advanced technology usage. Standard errors (in parentheses) are clustered at the Domestic Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.28: Effects of Sanctions on Mexican Exports to Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Export to Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	-0.0481	0.0673	-0.1972**	-0.0145
	(0.0419)	(0.0775)	(0.0984)	(0.0252)
R^2	0.149	0.394	0.378	0.369
Panel B. DV: IHS(Export to CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0117	-0.0807*	0.1019	0.0139
	(0.0265)	(0.0450)	(0.0631)	(0.0233)
R^2	0.246	0.624	0.676	0.548
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	37092	12364	12364	12364

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of exports of products p in Mexico to Russia and Belarus. Controls include $\text{Post}_t \times$Capital Intensity$_p$, $\text{Post}_t \times$Skill Intensity$_p$, and $\text{Post}_t \times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.29: Effects of Sanctions on Indian Exports to Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Export to Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	-0.0412	0.4094***	-0.5246***	-0.0082
	(0.0629)	(0.1512)	(0.0998)	(0.0384)
R^2	0.252	0.693	0.603	0.610
Panel B. DV: IHS(Export to CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0774*	0.0960	0.1356**	0.0008
	(0.0404)	(0.1050)	(0.0555)	(0.0131)
R^2	0.258	0.638	0.588	0.585
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	65802	21934	21934	21934

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of exports of products p in India to Russia and Belarus. Controls include $\text{Post}_t \times$Capital Intensity$_p$, $\text{Post}_t \times$Skill Intensity$_p$, and $\text{Post}_t \times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.30: Effects of Sanctions on Vietnamese Exports to Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Export to Russia + Belarus)				
Post$_t\times$SP$_p$	0.2193***	0.6211***	-0.0356	0.0723
	(0.0459)	(0.1132)	(0.0577)	(0.0462)
R^2	0.321	0.695	0.724	0.653
Panel B. DV: IHS(Export to CIS + SPFS Countries)				
Post$_t\times$SP$_p$	0 0.1115***	0.1531**	0.1406**	0.0407
	(0.0325)	(0.0668)	(0.0625)	(0.0335)
R^2	0.319	0.713	0.750	0.735
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	42867	14289	14289	14289

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of exports of products p in Vietnam to Russia and Belarus. Controls include Post$_t\times$Capital Intensity$_p$, Post$_t\times$Skill Intensity$_p$, and Post$_t\times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.31: Effects of Sanctions on Mexican Exports to Russia/Belarus (Firm-Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Export to Russia + Belarus)				
Post$_t\times$SP$_p$	-0.0345	-0.0073	-0.0485	-0.0407
	(0.0216)	(0.0318)	(0.0312)	(0.0522)
R^2	0.446	0.490	0.398	0.421
Panel B. DV: IHS(Export to CIS + SPFS Countries)				
Post$_t\times$SP$_p$	0.0127	-0.0332*	0.0397*	0.0244
	(0.0152)	(0.0198)	(0.0226)	(0.0499)
R^2	0.606	0.642	0.595	0.579
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	75889	27797	43274	4818

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of exports of products p in Mexico to Russia and Belarus. Controls include Post$_t\times$Capital Intensity$_p$, Post$_t\times$Skill Intensity$_p$, and Post$_t\times$Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the Firm$\times$Product level ($i-p$). *** p<0.01, ** p<0.05, * p<0.1.

Table B.32: Effects of Sanctions on Indian Exports to Russia/Belarus (Firm-Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Export to Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	0.0055	0.0298***	-0.1274***	0.0020
	(0.0094)	(0.0101)	(0.0261)	(0.0744)
R^2	0.598	0.601	0.549	0.643
Panel B. DV: IHS(Export to CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0109**	0.0093*	0.0187*	-0.0044
	(0.0046)	(0.0051)	(0.0110)	(0.0205)
R^2	0.558	0.561	0.529	0.632
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	936716	796840	127985	11891

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of exports of products p in India to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.33: Effects of Sanctions on Vietnamese Exports to Russia/Belarus (Firm-Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Export to Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	0.0394**	0.0428**	-0.0112	0.1522**
	(0.0159)	(0.0170)	(0.0420)	(0.0730)
R^2	0.710	0.714	0.702	0.678
Panel B. DV: IHS(Export to CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0546***	0.0228*	0.1655***	0.0629
	(0.0151)	(0.0117)	(0.0570)	(0.0570)
R^2	0.708	0.702	0.698	0.765
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	140613	105237	26312	9064

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of exports of products p in Vietnam to Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.34: Effects of Sanctions on Mexican Imports from Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Import from Russia + Belarus)				
Post$_t$×SP$_p$	-0.0594**	-0.0479	-0.0842*	-0.0461**
	(0.0266)	(0.0538)	(0.0430)	(0.0180)
R^2	0.173	0.412	0.427	0.298
Panel B. DV: IHS(Import from CIS + SPFS Countries)				
Post$_t$×SP$_p$	0.0060	0.0827**	-0.0444	-0.0203
	(0.0236)	(0.0380)	(0.0567)	(0.0264)
R^2	0.317	0.555	0.771	0.572
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	55044	18348	18348	18348

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of imports of products p in Mexico from Russia and Belarus. Controls include Post$_t$×Capital Intensity$_p$, Post$_t$×Skill Intensity$_p$, and Post$_t$×Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.35: Effects of Sanctions on Indian Imports from Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Import from Russia + Belarus)				
Post$_t$×SP$_p$	-0.1108**	-0.0921	-0.2258***	-0.0146
	(0.0492)	(0.1107)	(0.0777)	(0.0392)
R^2	0.271	0.619	0.501	0.437
Panel B. DV: IHS(Import from CIS + SPFS Countries)				
Post$_t$×SP$_p$	0.0313	0.0865	-0.0209	0.0282
	(0.0344)	(0.0809)	(0.0557)	(0.0178)
R^2	0.238	0.479	0.539	0.329
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	62271	20757	20757	20757

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of imports of products p in India from Russia and Belarus. Controls include Post$_t$×Capital Intensity$_p$, Post$_t$×Skill Intensity$_p$, and Post$_t$×Advanced Technology$_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.36: Effects of Sanctions on Vietnamese Imports from Russia/Belarus (Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Import from Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	-0.2121***	-0.4983***	-0.0883**	-0.0496
	(0.0375)	(0.0910)	(0.0370)	(0.0322)
R^2	0.223	0.546	0.497	0.417
Panel B. DV: IHS(Import from CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0281	-0.0040	0.0912	-0.0028
	(0.0364)	(0.0819)	(0.0666)	(0.0250)
R^2	0.297	0.679	0.640	0.438
Product FE	✓	✓	✓	✓
Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	58542	19514	19514	19514

Notes: Table reports the regression results of Equation (5.2) where the dependent variable is the value of imports of products p in Vietnam from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the product level (p). *** p<0.01, ** p<0.05, * p<0.1.

Table B.37: Effects of Sanctions on Mexican Imports from Russia/Belarus (Firm-Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Import from Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	-0.0040	0.0058	-0.0078	-0.0419*
	(0.0045)	(0.0084)	(0.0048)	(0.0254)
R^2	0.436	0.457	0.398	0.341
Panel B. DV: IHS(Import from CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0013	0.0095	-0.0018	-0.0293
	(0.0059)	(0.0064)	(0.0096)	(0.0224)
R^2	0.664	0.513	0.710	0.572
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	282392	120637	147972	13783

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of imports of products p in Mexico from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level ($i - p$). *** p<0.01, ** p<0.05, * p<0.1.

Table B.38: Effects of Sanctions on Indian Imports from Russia/Belarus (Firm-Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Import from Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	-0.0229***	-0.0248***	-0.0221***	0.0448
	(0.0050)	(0.0061)	(0.0086)	(0.0538)
R^2	0.493	0.495	0.467	0.523
Panel B. DV: IHS(Import from CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0007	0.0011	-0.0019	0.0172
	(0.0030)	(0.0035)	(0.0063)	(0.0186)
R^2	0.430	0.421	0.456	0.364
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	939972	701426	220286	18260

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of imports of products p in India from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.39: Effects of Sanctions on Vietnamese Imports from Russia/Belarus (Firm-Product Level)

	(1)	(2)	(3)	(4)
Panel A. DV: IHS(Import from Russia + Belarus)				
$\text{Post}_t \times \text{SP}_p$	-0.0275***	-0.0362***	-0.0128***	-0.0254**
	(0.0045)	(0.0073)	(0.0038)	(0.0122)
R^2	0.459	0.459	0.468	0.405
Panel B. DV: IHS(Import from CIS + SPFS Countries)				
$\text{Post}_t \times \text{SP}_p$	0.0091*	0.0118*	0.0063	0.0022
	(0.0048)	(0.0062)	(0.0090)	(0.0115)
R^2	0.571	0.584	0.557	0.426
Firm x Product FE	✓	✓	✓	✓
Firm x Quarter FE	✓	✓	✓	✓
Controls	✓	✓	✓	✓
Sample	Full Sample	Domestic firms	MNEs from sanctioning countries	MNEs from non-sanctioning countries
Observations	590975	353507	189189	48279

Notes: Table reports the regression results of Equation (5.6) where the dependent variable is the value of imports of products p in Vietnam from Russia and Belarus. Controls include $\text{Post}_t \times \text{Capital Intensity}_p$, $\text{Post}_t \times \text{Skill Intensity}_p$, and $\text{Post}_t \times \text{Advanced Technology}_p$. Standard errors (in parentheses) are clustered at the Firm×Product level $(i-p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.40: Effects on Import from Russia and Belarus: Financial Risks

	(1)	(2)	(3)
	IHS(Import from Russia-Belarus)		
$\text{Post}_t \times \text{Multinational Sanc}_i \times \text{AVG4}_p$	-0.0075	-0.0098*	-0.0115**
	(0.0047)	(0.0050)	(0.0055)
$\text{Post}_t \times \text{Multinational No-Sanc}_i \times \text{AVG4}_p$	0.0141	0.0112	0.0108
	(0.0161)	(0.0160)	(0.0172)
$\text{Post}_t \times \text{Financial Profit Rate}_i \times \text{AVG4}_p$		0.0004**	0.0004**
		(0.0002)	(0.0002)
$\text{Post}_t \times \text{Liquidity Ratio}_i \times \text{AVG4}_p$		0.4872**	0.4331**
		(0.1960)	(0.1964)
$\text{Post}_t \times \text{Leverage}_i \times \text{AVG4}_p$		-0.0006	0.0012
		(0.0018)	(0.0019)
$\text{Post}_t \times \text{Firm Age}_i \times \text{AVG4}_p$		0.0042**	0.0075***
		(0.0020)	(0.0019)
$\text{Post}_t \times \text{Import}_{ip,2021}^{World}$		-0.0070***	-0.0096***
		(0.0004)	(0.0005)
$\text{Post}_t \times \text{AVG4}_p$			-0.0206**
			(0.0102)
$\text{Post}_t \times \text{Sanction Product}_p$			0.0036
			(0.0040)
R^2	0.536	0.536	0.494
Firm x Product FE	✓	✓	✓
Firm x Quarter FE	✓	✓	✓
Product x Quarter FE	✓	✓	-
Observations	1446698	1446698	1448381

Notes: Table reports the regression results of Equation (8.1) where the dependent variable is the value of imports of products p in India, Mexico, or Vietnam from Russia and Belarus. Financial Vulnerability$_p$ is the standardized mean of external finance dependence, inventory ratio, trade credibility and asset tangibility collected from Manova et al. (2015). Financial Profit Rate$_i$ is firm i's financial profit divided by its financial expenditure in 2021. Liquidity Ratio$_i$ equals (*Current assets$_i$* − *Stocks$_i$*) divided by *Current liabilities$_i$* in 2021. Leverage$_i$ equals (*Non current liabilities$_i$* + *Loans$_i$*) divided by *Shareholders funds$_i$* in 2021. Firm Age$_i$ is the log value of firm i's age. Standard errors (in parentheses) are clustered at Firm-Product level $(i - p)$. *** p<0.01, ** p<0.05, * p<0.1.

Table B.41: Effects on Export to Russia and Belarus: Financial Risks

	(1)	(2)	(3)
	IHS(Export to Russia-Belarus)		
$\text{Post}_t \times \text{Multinational Sanc}_i \times \text{FPC4}_p$	-0.0057	0.0025	0.0132
	(0.0102)	(0.0107)	(0.0103)
$\text{Post}_t \times \text{Multinational No-Sanc}_i \times \text{FPC4}_p$	-0.0123	-0.0078	-0.0024
	(0.0164)	(0.0165)	(0.0156)
$\text{Post}_t \times \text{Financial Profit Rate}_i \times \text{FPC4}_p$		-0.0000	0.0000
		(0.0001)	(0.0001)
$\text{Post}_t \times \text{Liquidity Ratio}_i \times \text{FPC4}_p$		0.3120	0.4919
		(0.5955)	(0.6183)
$\text{Post}_t \times \text{Leverage}_i \times \text{FPC4}_p$		-0.0025	-0.0044
		(0.0031)	(0.0032)
$\text{Post}_t \times \text{Firm Age}_i \times \text{FPC4}_p$		-0.0116***	-0.0141***
		(0.0027)	(0.0027)
$\text{Post}_t \times \text{Export}_{ip,2021}^{World}$		-0.0348***	-0.0394***
		(0.0013)	(0.0014)
$\text{Post}_t \times \text{FPC4}_p$			0.0296
			(0.0188)
$\text{Post}_t \times \text{Sanction Product}_p$			0.0354***
			(0.0106)
R^2	0.630	0.631	0.610
Firm x Product FE	✓	✓	✓
Firm x Quarter FE	✓	✓	✓
Product x Quarter FE	✓	✓	-
Observations	765006	765006	767030

Notes: Table reports the regression results of Equation (8.1) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Financial Vulnerability$_p$ is the first principal component of external finance dependence, inventory ratio, (the negative of) trade credit intensity and (the negative of) asset tangibility collected from Manova et al. (2015). Financial Profit Rate$_i$ is firm i's financial profit divided by its financial expenditure in 2021. Liquidity Ratio$_i$ equals (*Current assets$_i$* − *Stocks$_i$*) divided by *Current liabilities$_i$* in 2021. Leverage$_i$ equals (*Non current liabilities$_i$* + *Loans$_i$*) divided by *Shareholders funds$_i$* in 2021. Firm Age$_i$ is the log value of firm i's age. Standard errors (in parentheses) are clustered at Firm-Product level ($i - p$). *** p<0.01, ** p<0.05, * p<0.1.

Table B.42: Effects on Export to Russia and Belarus: Financial Risks

	(1)	(2)	(3)
	IHS(Export to Russia-Belarus)		
$\text{Post}_t \times \text{Multinational Sanc}_i \times \text{AVG4}_p$	-0.0059	0.0139	0.0119
	(0.0179)	(0.0191)	(0.0187)
$\text{Post}_t \times \text{Multinational No-Sanc}_i \times \text{AVG4}_p$	0.0008	0.0019	-0.0032
	(0.0274)	(0.0279)	(0.0268)
$\text{Post}_t \times \text{Financial Profit Rate}_i \times \text{AVG4}_p$		-0.0002	-0.0001
		(0.0001)	(0.0001)
$\text{Post}_t \times \text{Liquidity Ratio}_i \times \text{AVG4}_p$		1.3110	1.8915*
		(0.9573)	(0.9853)
$\text{Post}_t \times \text{Leverage}_i \times \text{AVG4}_p$		0.0005	-0.0034
		(0.0061)	(0.0061)
$\text{Post}_t \times \text{Firm Age}_i \times \text{AVG4}_p$		-0.0085	-0.0075
		(0.0052)	(0.0053)
$\text{Post}_t \times \text{Export}^{World}_{ip,2021}$		-0.0350***	-0.0397***
		(0.0013)	(0.0014)
$\text{Post}_t \times \text{AVG4}_p$			-0.0062
			(0.0349)
$\text{Post}_t \times \text{Sanction Product}_p$			0.0289***
			(0.0106)
R^2	0.630	0.631	0.610
Firm x Product FE	✓	✓	✓
Firm x Quarter FE	✓	✓	✓
Product x Quarter FE	✓	✓	-
Observations	765006	765006	767030

Notes: Table reports the regression results of Equation (8.1) where the dependent variable is the value of exports of products p in India, Mexico, or Vietnam to Russia and Belarus. Financial Vulnerability$_p$ is the first principal component of external finance dependence, inventory ratio, (the negative of) trade credit intensity and (the negative of) asset tangibility collected from Manova et al. (2015). Financial Profit Rate$_i$ is firm i's financial profit divided by its financial expenditure in 2021. Liquidity Ratio$_i$ equals (*Current assets$_i$ − Stocks$_i$*) divided by *Current liabilities$_i$* in 2021. Leverage$_i$ equals (*Non current liabilities$_i$ + Loans$_i$*) divided by *Shareholders funds$_i$* in 2021. Firm Age$_i$ is the log value of firm i's age. Standard errors (in parentheses) are clustered at Firm-Product level ($i-p$). *** p<0.01, ** p<0.05, * p<0.1.