Trade Sanctions

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Abstract

We review the economics of trade sanctions and provide new macro and micro evidence with the Russia 2014 and 2022 episodes as central case studies. On the macro side, we calibrate a multi-country, multi-sector general-equilibrium trade model with input–output linkages to quantify welfare effects under alternative coalition and intensity scenarios. Relative to 2014, the 2022 measures imposed substantially larger costs on Russia (about –2.6% of real income) while the average cost for EU/UK senders remained modest (around –0.1%), with larger losses in highly exposed small economies. Coalitions amplify pressure on the target at limited additional cost for most senders; hypothetical extensions bound sanctions potential (e.g., global participation or embargoes). On the micro side, using French customs data (monthly firm–product–destination flows, 2021–2023) and a triple-difference design, we show that exports to Russia fell by roughly three quarters after February 2022. The adjustment is dominated by the extensive margin, with smaller but significant intensive-margin declines among continuing firms. Targeted products contracted far more than non-targeted ones (dual-use goods most severely), and we document diversion consistent with rerouting to nearby non-sanctioning countries. We further discuss financial channels that propagate losses beyond listed goods, limits of "smart" sanctions when governments shield strategic firms, and political responses—including rally-around-the-flag effects.

Keywords: Economic sanctions; international trade; trade diversion and circumvention;

JEL: F13, F14, F51.

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1 Introduction

Economic sanctions likely have a history as old as war itself, but they have evolved significantly over time. From their origins as simple tools accompanying armed conflict (e.g., city sieges, blockades), sanctions have gradually become an independent "economic weapon" since the end of the First World War. This evolution and the increasing reliance on sanctions mirror the history of globalization.[1]

The Global Sanctions Database (Syropoulos et al., 2023), or GSDB, compiles all international economic sanctions imposed between 1950 and 2022. The authors of the database define sanctions as "restrictive political measures undertaken by one or more countries to limit their relations with a target country in order to persuade it to change its policies or address potential violations of international norms and conventions." These measures span a wide range of interventions:

- Trade sanctions: Export and/or import restrictions, ranging from discretionary restrictions to bans and embargoes.
- Financial sanctions: Freezing financial assets or investments (productive, real estate, or movable assets), restrictions on new international investments, cessation of public development aid, limitations on payment mechanisms (e.g., restrictions on the use of the US dollar or exclusion of banks from the SWIFT system, such as Iranian banks in 2012 or Russian banks in 2022).
- Travel restrictions: Stricter visa issuance policies towards individuals or groups of people, or specific travel authorizations for targeted countries.
- Arms embargoes: Cessation of military cooperation, limitations on the delivery of weapons, munitions, or dual-use goods, constraints on financing or industrial cooperation with companies in the defense sector.

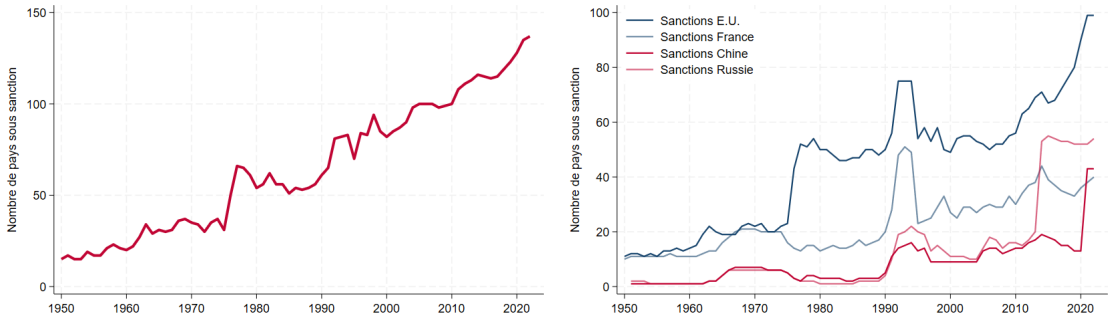
Two additional types of measures not explicitly captured in the GSDB merit attention:

- Diplomatic and cultural sanctions: Expulsion of diplomats, cancellation of meetings or invitations to public events, and cessation of cultural collaborations and exchanges. While these measures have limited short-term impacts on economic relations, they may temporarily disrupt economic cooperation activities, commercial transactions involving government entities, or lead to spontaneous boycotts (see Fuchs and Klann (2013) for an empirical analysis).
- Trade wars: Increases in tariffs or other formal trade restrictions. While these measures directly impact international economic relations, it is often difficult to distinguish trade protectionism aimed at influencing a targeted country's policies

[1] For a detailed history of the use of economic sanctions, see Mulder (2022).

Figure 1: Number of Countries Under Sanctions

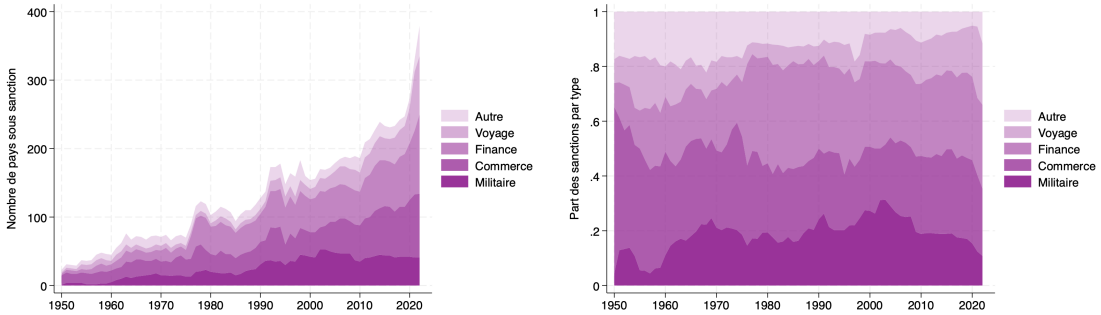
(a) All Sanctions **(b)** Sanctions by France and the US



Sources: Author calculations, Global Sanctions Database (Syropoulos et al., 2023).

Figure 2: Types of Sanctions

(a) Number of Countries Sanctioned **(b)** Share of Total Sanctions



Sources: Author calculations, Global Sanctions Database (Syropoulos et al., 2023).

(and thus akin to sanctions) from measures with purely economic objectives falling under conventional trade policy (compare e.g. the second Trump administration's sudden threat of imposition of drastic tariffs against Colombia in January 2025 after the country disallowed the landing of two US military aircraft carrying return migrants).

Since the 1950s, the number of instances in which these measures were used has steadily increased, becoming a structural feature of international economic relations (see Figure 1a).[2] The evolution of sanctions parallels the process of global economic integration, with notable accelerations in the mid-1980s and the 2000s. This proliferation of sanctions is, if not a natural consequence, at least a predictable byproduct of globalization. More significant, however, is the number of countries under sanctions. Today, over 130 countries are targeted by at least one type of international sanction, representing two-thirds of the world's nations. This highlights the central role of sanctions in foreign policy and global governance. The increasing use of international sanctions has led researchers to develop

[2]This growth must be contextualized: during the Cold War, the segmentation of economies along bloc lines effectively served as de facto sanctions, obviating the need for formal measures.

a guide on the most effective types of sanctions. de Souza et al. (2024) model scenarios where specific sanctions, such as tariffs or embargoes, are the most cost-efficient.

Unsurprisingly, sanctions remain the purview of major Western nations (see Figure 1b). Of the 137 countries targeted in 2022, 99 were sanctioned by the United States and 40 by the EU. However, the field is expanding, with countries like Russia and China increasingly employing counter-sanctions, as seen in 2014 (Russia's response to sanctions over the annexation of Crimea) and 2021 (China's reaction to European sanctions over Xinjiang and Taiwan).

The nature of sanctions has also evolved to match the growing complexity of international economic and financial relations, becoming more precise, targeted, and difficult to circumvent. However, when categorized into broad types, no major shift is observable since the 1950s (Figure 2). A notable increase in financial sanctions occurred in the mid-1970s, coinciding with the end of the fixed exchange rate system and the rise of international financial flows.

This article reviews the burgeoning literature on the economics of trade sanctions and provides new empirical evidence on their effects. We survey the literature by examining the impact of sanctions through two primary lenses: the aggregate, macro-level effects on trade and welfare, which can be quantified using general equilibrium models; and the granular, micro-level adjustments made by individual firms, which can be identified using customs data. We explore foundational topics such as trade diversion, counter-sanctions, and the role of international coalitions, which determine the broad economic pressure a sanctioning regime can exert. We then zoom into firm-level decisions at the extensive margin (staying in or exiting a market) and the intensive margin (adjusting the value of existing trade flows), which reveal the underlying mechanisms of how sanctions disrupt commerce.

The sanctions imposed on the Russian Federation in 2014 and 2022 serve as a central case study for both levels of analysis. The 2014 sanctions, which followed Russia's annexation of Crimea, were relatively targeted and met with specific counter-sanctions from Russia, notably an embargo on agricultural products. In contrast, the measures enacted after the full-scale invasion of Ukraine in February 2022 were far broader, involving an unprecedented coalition of countries and targeting key Russian financial institutions, strategic industries, and dual-use technologies. We leverage this two-stage episode first to conduct a macro-level simulation of the global welfare effects using a quantitative trade model. We then provide a new micro-level analysis of the impact on French exporters, using firm-level customs data to disentangle the effects of the conflict and the sanctions themselves. Finally, we cover two auxiliary questions regarding trade sanctions: the practical and theoretical limits of designing "smart" sanctions that avoid collateral damage, and the ultimate impact of economic pressure through trade sanctions on political stability

and public opinion in the targeted regime.

2 Macro-level Impact of Trade Sanctions

Among the intermediate objectives of sanctions, disrupting international trade flows is prominent. This is either because the sanctions directly target trade (see Figure 2) or because restrictions on financial flows and travel affect cross-border business activities.[3]

For sanctions to be effective, they must weaken the targeted economy without being excessively costly for the sanctioning country (compare also Chowdhry et al., 2024, discussed below). While the interruption of imports from the targeted country might often be celebrated, the reduction in export flows is often seen as an unavoidable cost of imposing sanctions. This distinction between the apparent positive effects (halting imports) and the costs (halting exports) bears the hallmarks of a mercantilist narrative and warrants discussion from the perspective of the sanctioning country.

It is true that the interruption of exports represents a cost for the sanctioning country, the decline in sales to the targeted country reflects real losses in activity and income (see e.g. Crozet and Hinz, 2020). However, tying national welfare to maximizing exports and minimizing imports reflects a mercantilist view of international trade, which does not hold up to thorough analysis. In fact, it is difficult to distinguish between the blows dealt to the targeted country and those self-inflicted by the sanctioning country. The decline in exports cannot simply be regarded as an unfortunate consequence or a necessary price to pay. Instead, it is also a deliberate aim of sanctions. This is particularly evident when trade restrictions involve strategic goods (e.g., the blocking of dual use or outright military goods, like French Mistral-class ships to Russia in 2014, represents both a cost to the French economy and a goal of the sanctions). On the flipside, restrictions to imports may also have the potential for serious disruptions, as was evident in the debate on decoupling from Russian gas in 2022 (see e.g. Bachmann et al., 2024). More fundamentally, international trade theory reminds us that the benefits of trade are derived as much (if not more) from imports as from exports. By reducing its exports, the sanctioning country deprives the targeted country of imports, thereby imposing a certain economic cost.

It is important to note that, in a globalized world, the costs of sanctions are not limited to the sanctioning and sanctioned countries. Kwon et al. (2024) identify the "extraterritorial effects" of sanctions. Their analysis of the U.S. embargo on Cuba shows that its impact on other countries varies. Nearby economic allies increased trade with Cuba after the

[3]Besides the common trade sanctions tools listed above, Lim and Ferguson (2022) define "informal sanctions" as a government-directed disruption of international commerce that does not appear in official laws, yet which seeks to impose costs on key firms or industries. Their three main instruments include "strategic regulation", "informal blacklisting", and "boycott fomentation". They were used, for instance, on behalf of China against South Korea because of the terminal high-altitude area defense (THAAD) missile system deployment between 2016 and 2017.

sanctions were imposed. Ghironi et al. (2024) refer to this phenomenon as "third-country effects." By developing and calibrating a model for Western sanctions against Russia in 2022, they conclude that welfare losses tend to be greater for sanctioning countries and smaller for sanctioned ones if third countries do not participate. Meanwhile, third countries (such as China, India, and Türkiye in this case) benefit from staying out of the sanctions (see e.g. Corsetti et al., 2025). As sanctions increase over time and more third countries become involved, research on their impact is likely to grow.

Diversion and Circumvention

Globalization has complex effects on international conflicts and the consequences of sanctions (see Martin et al. (2008) for a detailed theoretical and empirical analysis). On the one hand, the broad integration of most countries into international trade has increased economic interdependencies, raising the economic costs of conflicts and enhancing the effectiveness of sanctions. However, globalization does not make perpetual peace inevitable, as envisioned by Kant (or Montesquieu's concept of "gentle commerce"). The proliferation of trade partners also increases the ability of countries to compensate for the interruption of bilateral trade relations by diverting them to other countries.

Accounting for these diversion effects is essential in impact analysis. The ability to quickly reroute trade flows is a factor in the economic independence of countries and their resilience to sanctions. It is important to clearly define what is meant by "diversion" and distinguish it from "circumvention," where regulatory constraints are intentionally bypassed by routing goods through a third country or relabeling them. Recent episodes demonstrate these circumvention mechanisms in action. Haidar (2017), for example, shows how Iranian companies — particularly larger ones — mitigated the effects of sanctions by redirecting exports to hub countries (e.g., Turkey, Gulf states), which simultaneously saw their exports increase. Chupilkin et al. (2024, 2025a) show that in 2022, Russian firms swiftly reorganized their supplier networks. While imports of sanctioned goods from Western countries plummeted, imports of the same products originating from sanctioned economies or bearing Western brands but transshipped through neutral countries increased by 100–200%. Similarly, Chupilkin et al. (2025b), using aggregate data, reveal that former Soviet republics played a complicit role in channeling exports of goods targeted by sanctions against Russia since 2022, corroborating numerous anecdotes reported in European media. Aytun et al. (2024) report similar findings for Turkish firms re-rerouting exports to Russia via Caucasus countries in response to an embargo of Turkish agricultural produce *by Russia* following political tensions in 2015. Neglecting these effects would naturally lead to an overestimation of sanctions' impacts.

Simple trade diversion, understood as the reorganization of trade networks, is far less problematic. From a general equilibrium perspective, these mechanisms are natural and

fully contribute to assessing sanctions' effectiveness. Unless sanctions target highly specific and irreplaceable products, trade barriers will inevitably be lead to new connections to varying degrees. Faced with the unavailability of their usual suppliers, consumers and businesses in the targeted country must find alternatives — turning to local production, other exporting countries, or substitute products. However, these diversions come at a cost. Resorting to less competitive suppliers imposes economic losses on the targeted country. This was clearly evident during Europe's 2022 energy crisis: EU countries compensated for the (partial) cessation of Russian gas, coal, and oil supplies, but at significantly higher procurement costs. Another example is Russia's 2014 embargo on agricultural products from Western countries. Using detailed Russian consumer price data, Hinz and Monastyrenko (2022) assessed the consequences of this import halt. The need to rely on other suppliers (local or non-embargoed countries) increased the prices of affected goods by 7.7–15% in the short term and by 2.6–8% in the longer term. Ultimately, the Russian embargo raised the consumer price index by 0.33% and reduced household welfare by nearly 2%. Circumventing sanctions is similarly costly. For the 2022 sanctions episode, Chupilkin et al. (2024) shows that bypassing direct Western imports via intermediaries in neutral countries led to an average import price increase of 20–40%.

Macroeconomic estimates of sanctions' impacts are primarily based on measuring the consequences of trade flow reorganization. Welfare losses attributable to sanctions stem from both reduced export revenues (due to reorientation towards less competitive markets) and higher consumer prices resulting from replacing competitive imports with less efficient suppliers.

Counter-Sanctions and Retaliation

As countries targeted by sanctions increasingly employ reciprocal sanctions, also denoted as "counter-sanctions", authors investigate whether these might have equally damaging, or potentially even more harmful, impact than the initial sanctions. In 2014, the US, EU, Canada, Japan, Ukraine, and other countries imposed economic sanctions on the Russian Federation due to its annexation of Crimea. In response, the Russian Federation imposed counter-sanctions and introduced import bans on a wide range of agricultural products. The impact of these sanctions and counter-sanctions are examined by Nguyen and Do (2021). According to their results, sanctions led to a significant decline in Russia's exports, especially in oil products, and counter-sanctions also substantially reduced its imports. There was a 25% decline in the Russian aggregate export values and a 26% decrease in its imports from sanctioning countries. The results are not homogeneous among product categories, with a reduction of about 37% of Russia's export value of oil products, while the effects on non-oil categories were insignificant. On the other hand, the counter-sanctions caused a decline in the import value of agro and non-agro products by 55% and 21%, respectively. Overall, these non-tariff barriers were harmful to both

sanctioning and sanctioned economies.

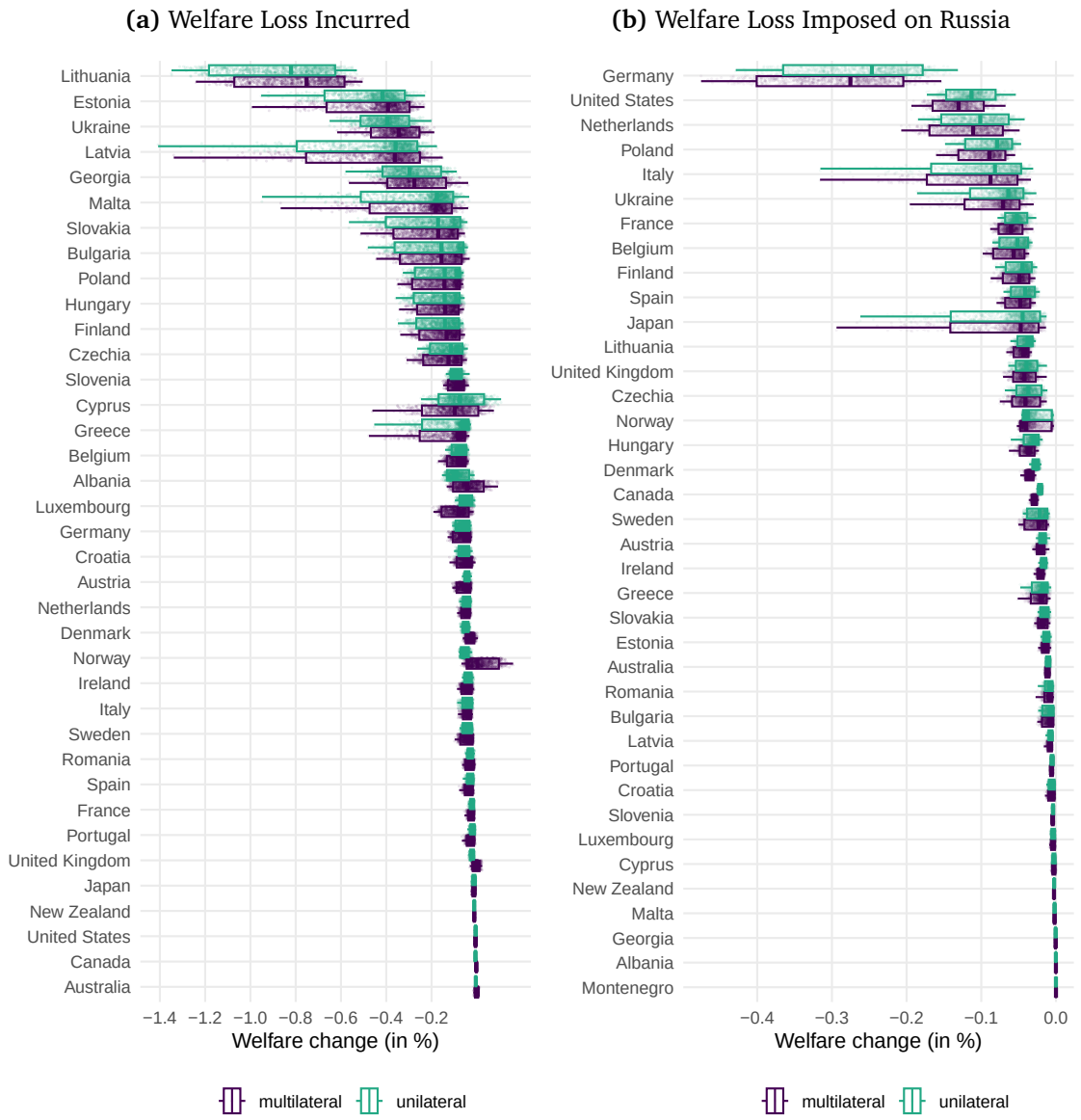
Moreover, Bělín and Hanousek (2021) conclude that the Russian sanctions imposed on European and American food imports after 2014 resulted in about an 8 times stronger decline in trade flows than those imposed by the EU and the US on exports of extraction equipment. This is due to the fact that the costs of imposing trade restrictions are higher for the sender countries, the Western coalition designing its sanctions in such a way as to minimize costs to domestic interest groups, allowing exporters to honour pre-existing contracts. The consequences of the Russian agricultural import ban in 2014 are also investigated by Fedoseeva and Herrmann (2019), who focus on the German export market. According to their study, the ban is just one of a list of factors that have reduced exports. Other significant contributors include political imbalances, the depreciating ruble, and falling oil prices. Thus, lifting the ban alone is unlikely to restore trade with Russia to pre-sanction levels.

Chowdhry et al. (2024) provides an example of a general equilibrium model calibration aimed at assessing the welfare losses experienced by Russia and the countries in the Western coalition. Figure 3 presents the results for the case of the 2014 sanctions against Russia. The study employs a quantitative general equilibrium trade model similar to that of Caliendo and Parro (2015). The panel on the left displays the welfare losses incurred by each member of the coalition sanctioning Russia. The heterogeneity is substantial. Small countries (due to their structural openness to trade and hence greater sensitivity to trade disruptions) and/or those geographically close to Russia bear relatively high costs: the welfare loss for the Baltic states is estimated between -0.8% and -0.2%. Conversely, countries with limited trade exposure to Russia suffer negligible losses.

The right panel illustrates the welfare cost borne by Russia, attributable to each coalition member. Here, economies with significant weight in Russia's exports and/or imports naturally have the greatest impact (e.g., Germany, the United States, and Poland). This clearly highlights the role of size asymmetries in the dynamics of sanctions. Sanctions are more effective (in the sense that the cost imposed is greater than the cost incurred) when imposed by a major trading power (which constitutes a large share of the target country's trade) on a smaller country (which accounts for a small share of the sanctioning country's trade).

The figures also underscore the importance of coalitions. Two scenarios are tested. The "unilateral" scenario shows the costs (imposed and incurred) if each country decides to sanction Russia independently, without others' involvement. The "multilateral" scenario illustrates the welfare consequences when each country opts to join an already-formed coalition of sanctions. It becomes evident that unilateral sanctions are costlier for the sanctioning country and less effective (with smaller costs imposed on Russia). The logic is straightforward: if a country like Poland sanctions Russia alone, the latter can

Figure 3: Costs of Sanctions on Russia (2014) – Source: Chowdhry et al. (2024)



relatively easily redirect its trade, both imports and exports, to other European countries. However, if Poland joins the European coalition, Russia must seek alternative suppliers and markets further afield, leading to greater price increases (due to higher import costs) and larger wage reductions (due to decreased perceived demand and the need for greater competitiveness).

3 Case Study: Macro-level Impact of the Sanctions against Russia in 2014 and 2022

In 2014, following the annexation of Crimea and the conflict in Eastern Ukraine, the US, EU, and partners imposed sanctions on the Russian Federation; Russia responded with agricultural counter-sanctions. In February 2022, the full-scale invasion of Ukraine triggered a broader and more coordinated package of trade and financial measures, including, early on, the exclusion of seven Russian banks from the SWIFT system (March 2022). As discussed above, third countries such as China, India, and Türkiye largely remained outside the coalition, shaping both circumvention incentives and third-country effects.

3.1 Methodology

This section provides a quantification of the trade sanctions against Russia imposed in 2022, along with a comparison to the sanctions of 2014, using a quantitative model. The method replicates the approach by Chowdhry et al. (2024), relying on a general equilibrium multi-country, multi-sector trade model with input-output linkages inspired by Caliendo and Parro (2015). In the model, technologies are Ricardian, markets are competitive, and sectors are linked through input–output networks, so shocks propagate along supply chains. The model is solved in changes ("hat algebra"), which avoids recovering hard-to-observe levels and makes large counterfactual exercises tractable. Sanctions enter as bilateral, sector- and direction-specific increases in trade costs. Calibration draws on WIOD for IO coefficients, consumption shares, tariffs, and global services/energy trade; BACI is used for goods trade shares and balances. Uncertainty is quantified with a Bayesian bootstrap. We draw common weights across sectors so the correlated trade-network structure is preserved, re-estimate the gravity shocks under those weights, and feed each draw through the general-equilibrium model. This yields confidence bands for both the sanction-induced trade-cost changes and the simulated outcomes (here, welfare for targets and senders).[4].

The following scenarios are considered:

- Scenario 1 examines the 2014 sanctions and counter-sanctions against Russia.
- Scenario 2 evaluates the impact of the 2022 sanctions against Russia.
- Scenario 3 simulates the consequences of extending the 2022 coalition to all other countries worldwide (including China). While highly improbable, this hypothesis gauges the current coalition's coercive power.
- Scenario 4 simulates the effects of the U.S. withdrawing from the coalition. This scenario is more plausible, potentially reflecting a shift in U.S. policy under a more

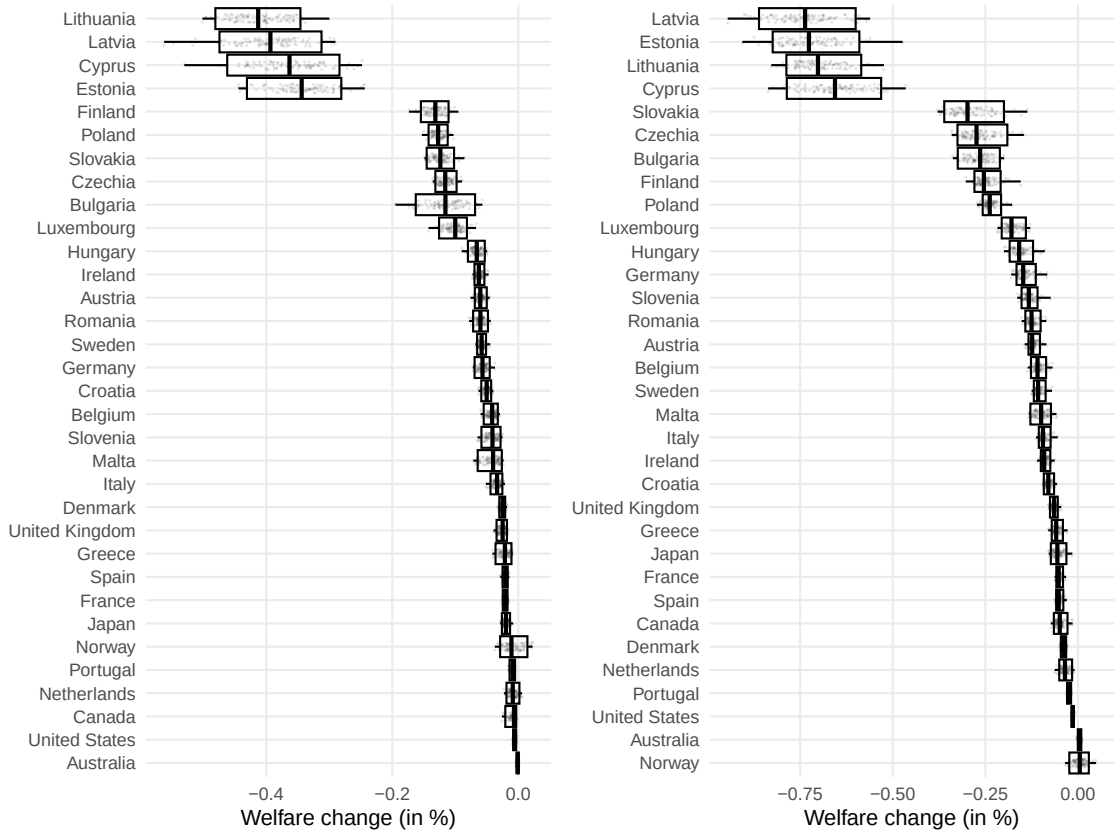
[4]See Chowdhry et al. (2024) for a complete technical description.

isolationist administration or one less invested in European affairs. Crucially, it highlights the U.S.'s contribution to pressure on Russia.

- Scenario 5 simulates the impact of intensifying sanctions to a complete trade embargo (total blockade).
- Scenario 6 considers a total embargo imposed only by the EU, with other coalition countries maintaining sanctions at current levels.
- Scenario 7 represents the most extreme case: a global embargo on Russia, effectively placing the country in complete autarky.

3.2 Results

Figure 4: Impact Estimates of Russian Sanctions in 2014 and 2022



(a) Scenario 1: Benchmark 2014

(b) Scenario 2: Benchmark 2022

Figures 4a and 4b show the welfare impact of the sanctions in 2014 and 2022 on sanctioning countries. Welfare changes are measured as percentages of real national income reductions, with negative values indicating welfare losses.

In the 2014 sanctions scenario (4a), the countries most affected in terms of welfare costs are Lithuania, Latvia, Cyprus, and Estonia—countries with historically close economic ties

to Russia. For these countries, welfare reductions approach -0.4%.[5] Conversely, countries far away from Russia and less economically involved in the region — like Australia, the United States, and Canada — show almost negligible and statistically insignificant welfare variations. For France, the welfare loss attributed to sanctions is estimated at -0.02%.

In the 2022 sanctions scenario (4b), the most affected countries again include Latvia, Estonia, Lithuania, and Cyprus, but the losses are now nearly twice as large: around -0.75% of real income. For the least affected countries (the U.S., Australia, and Norway, which benefited from rising energy prices), the associated costs remain economically and statistically insignificant. France's cost has increased significantly compared to 2014, yet remains modest at -0.05%. The United Kingdom's estimated loss is -0.065%, and Germany—highly dependent on exports—bears a noticeably higher cost of -0.148% (up from -0.057% in 2014). On average (weighted by GDP), the EU's total welfare cost is around -0.1% (compared to -0.047% in 2014).

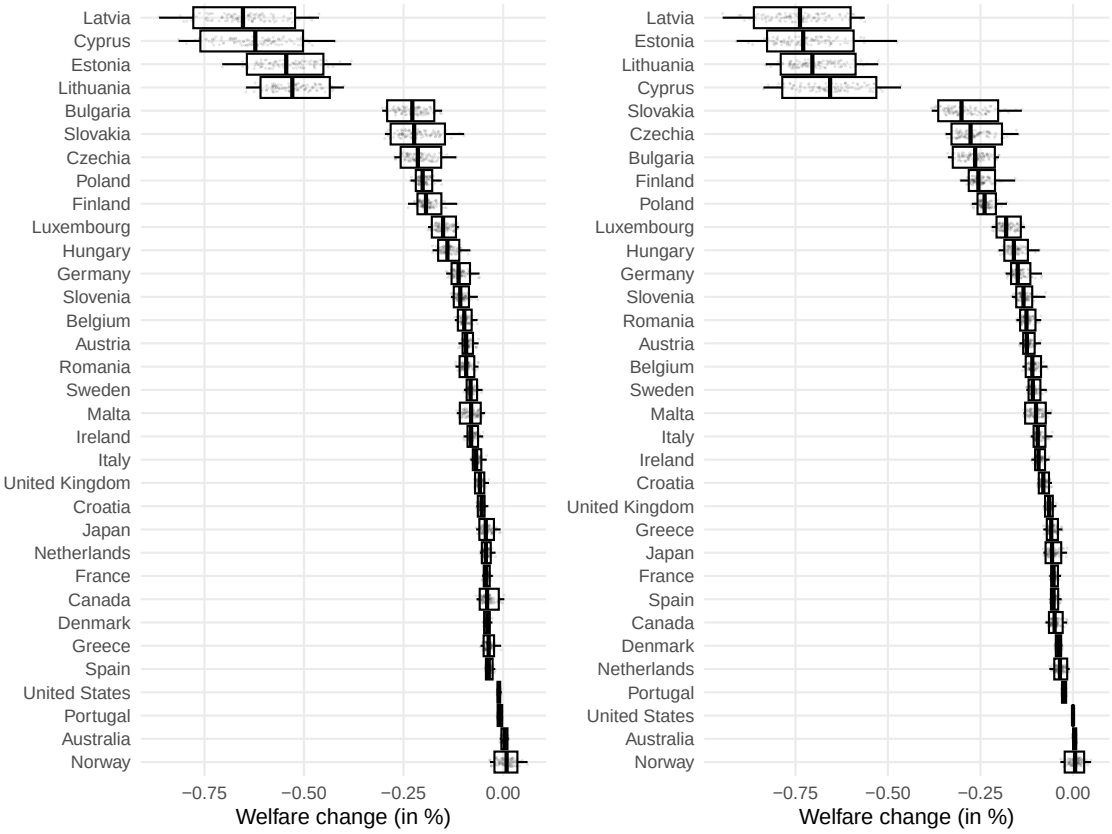
These welfare losses for European countries, while small fractions of real income, represent an important contribution to Western support for Ukraine. The Kiel Institute for the World Economy tracks direct aid to Ukraine since February 2022: Until early 2025, aid totaled 77.7 billion from EU countries and institutions, 9.1 billion from the UK, and 67 billion from the U.S., along with a recently approved 61 billion package. By this measure, European countries lag behind the U.S. in their support for Ukraine (128 billion vs. less than 87 billion). However, when the cost of sanctions is included, financial contributions are more evenly distributed across the Atlantic. If, as estimated, the EU and UK suffered a loss equivalent to 0.1% of 2021 real GDP, this amounts to a total cost of approximately 41 billion over two years of war. This brings Europe's total war effort to over 127 billion, with one-third attributable to sanctions.

The impact on Western countries pales in comparison to the economic shock imposed on Russia. In the 2014 baseline scenario, sanctions cost Russia approximately 1.05% of welfare. In 2022, this figure increased significantly to 2.6%. This is about 26 times higher, as a percentage of national income, than what EU countries endured. Considering differences in economic size, the absolute cost for Russia compared to Europe is smaller. The 2.6% reduction in 2021 real income corresponds to over 40 billion—double the amount borne by the European coalition, though it is close to the total cost borne by the entire Western coalition.

Figures 5a and 5b present results from two hypothetical scenarios (3 and 4). On the left, the impact of 2022 sanctions applied by a global coalition is shown. While this is highly unlikely, it evaluates the power of circumvention mechanisms. Excluding Russia, the European countries most affected remain Latvia, Estonia, Lithuania, and Cyprus. The

[5] A 0.4% change is economically significant. During the 2010s, the Baltic states recorded annual growth rates of about 3%. Losing roughly half a percentage point represents about 1/6th of annual growth.

Figure 5: Hypothetical Coalition Scenarios



(a) Scenario 3: Global Coalition

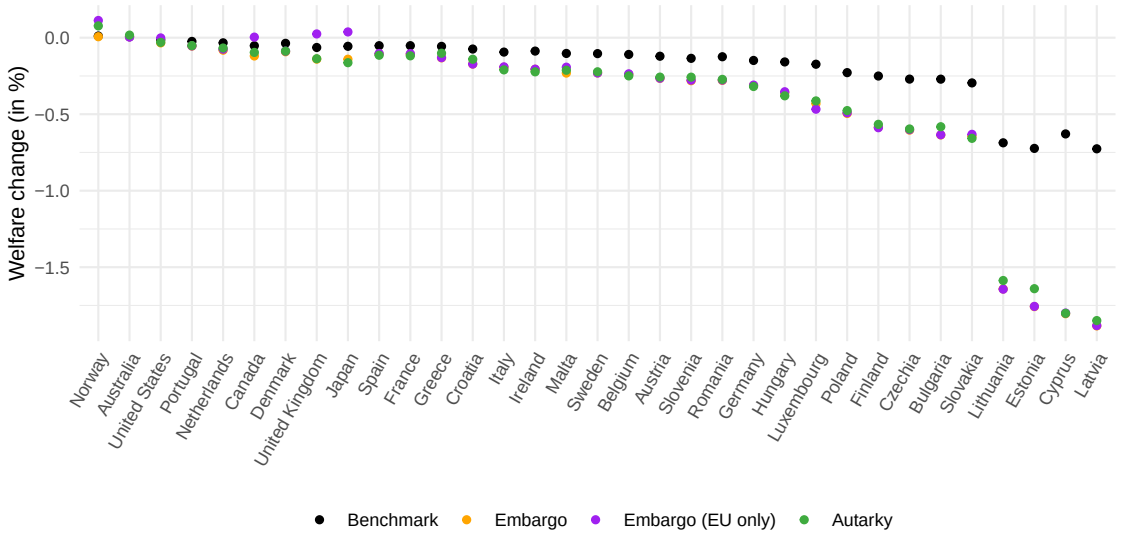
(b) Scenario 4: Coalition Without the U.S.

magnitude of shocks is also very similar to Scenario 2, with only minor variations. The main difference is seen in Russia. Multiplying bilateral relationships under sanctions and limiting Russia's ability to turn to substitute suppliers triples the welfare loss to -7.23%. Extending the coalition does not equitably distribute the economic burden of sanctions but instead amplifies efforts and increases pressure on Russia.

Scenario 4 is more plausible, envisioning the U.S. withdrawing from the coalition due to potential political changes in Washington. Such a withdrawal, if accompanied by halting arms shipments and intelligence support, would have significant military consequences. However, on the sanctions front, the impact would be minimal. Once again, the costs borne by European countries would remain nearly the same. The blow to Russia would also remain largely unaffected: from -2.6% in the baseline scenario to -2.51%.

Figure 6 shows results for Scenarios 5, 6, and 7, focusing on the intensity of trade restrictions rather than coalition size. As before, the economic costs of each sanctions package are shown as changes in average welfare (confidence intervals are omitted for simplicity). Different colors represent scenarios: black for the baseline (2022 sanctions), orange for a total embargo imposed by the current coalition, purple for an EU-only

Figure 6: Alternative Scenarios



embargo, and green for a global embargo on Russia.

Tightening sanctions would increase the economic cost for coalition countries. The difference is stark for the hardest-hit nations: Latvia, Estonia, Lithuania, and Cyprus, whose welfare losses approach or exceed -1.5% under extreme measures, compared to -0.7% in the current situation. Conversely, broadening the coalition (total autarky, green points) slightly eases their burden. At the opposite end, countries like Norway, Australia, the U.S., and Canada show minimal welfare changes. Norway might even benefit from a complete trade disruption with Russia.

Unsurprisingly, Russia itself remains by far the hardest hit in any hypothetical scenario. Under a total embargo by the current coalition, Russia would experience a 5.05% decline in real income. If only the EU implemented an embargo, the decline would still be 3.8%, while global autarky would impose a 20.67% loss of GDP. The economic costs of sanctions for Russia across scenarios are summarized in Table 1. The figure of 20.67%, representing the most extreme and least probable case, is worth discussing. While this equates to an immense economic crisis, it would not completely cripple the Russian economy. Like all large nations, Russia is structurally less exposed to trade shocks due to production diversity and transport costs. Nevertheless, this figure provides a benchmark for evaluating the intensity and effectiveness of current sanctions. With a 2.62% economic cost, existing sanctions achieve just over 10% of the maximum possible impact—a non-negligible outcome. Comparing Scenarios 2 and 5 is even more illuminating since intensifying sanctions is more feasible than expanding the coalition. Tightening trade restrictions to the maximum would double Russia's cost from -2.6% to -5.05%. This represents the remaining leverage available for threats to exert greater pressure on Russia.

Table 1: Summary of Welfare Effects by Sanction Scenarios

Scenario	Coalition	Sanction Intensity	Cost Imposed on Russia
Benchmark			
1	2014 Group	2014 Measures	1.06%
2	2022 Group	2022 Measures	2.62%
Counterfactual Scenarios - Coalition			
3	Global	2022 Measures	7.23%
4	Without U.S.	2022 Measures	2.6%
Counterfactual Scenarios - Embargos			
5	2022 Group	Total Embargo	5.05%
6	EU	Total Embargo	3.8%
7	Global	Total Embargo	20.67%

4 Firm-level Impact of Trade Sanctions

Another dimension to consider when evaluating the impact of sanctions on trade is the distinction between a simple reduction in trade volumes and higher prices, and a complete interruption of trade flows. This analysis requires using microeconomic data from firms' customs declarations. Aggregate reductions in exports (or imports) can be broken down into two complementary margins: the intensive margin, representing a reduction in the traded volume, and the extensive margin, which reflects the complete cessation of transactions. This distinction is crucial. Expanding trade networks into new destinations requires significant investments in building business relationships. This development is costly and gradual (see, for example, Morales et al. (2019) or Albornoz et al. (2012)). Extending firms' international networks is even slower and more challenging in environments characterized by high country risk (Berman et al., 2019).

The decision to entirely exit a sanctioned market may result explicitly from sanctions (e.g., for firms exporting prohibited goods) or from economic calculations when trade difficulties outweigh expected benefits. It may also reflect long-term strategic decisions, such as preserving brand image or market development.[6] The long-term impact of sanctions on trade differs depending on whether they primarily affect the extensive or intensive margins. Extensive margin effects are generally more profound and enduring:

Rebuilding business networks is costly in terms of both time and investment. Consequently, the effects of sanctions are asymmetric: lifting sanctions does not simply reverse their initial impacts. If sanctions are strong enough to disrupt trade relationships, they alter

[6]For example, Tosun and Eshraghi (2022) analyzed stock market reactions in February and March 2022 and found that Western firms continuing operations in Russia after the invasion were penalized compared to those choosing to exit. Through qualitative surveys of firms voluntarily leaving Russia in 2022, Hart et al. (2023) highlighted the significant influence of consumer perceptions in these decisions (or rather, firms' perceptions of their image among customers). This phenomenon of firms voluntarily leaving a market is often referred to as "self-sanctions".

business networks. Firms in both sanctioning and sanctioned countries sever their bilateral relationships and establish new ones, meaning the end of sanctions does not restore the initial status quo. For instance, Crozet et al. (2021) shows that the partial lifting of sanctions against Cuba or Myanmar did not lead to a sudden boom in bilateral trade comparable to the decline observed when sanctions were imposed. Similarly, Aytun et al. (2024) analyzed the relatively short-lived sanctions episode of Russia's agricultural embargo against Turkey following the November 2015 downing of a Russian military aircraft near the Syrian border. Their findings reveal clear negative effects on Turkish exports during the sanctions period, which persisted even after the embargo was lifted. Moreover, firms directly affected experienced a lasting reduction in sales (including in domestic markets) and employment.

A complete cessation of trade amounts to the destruction of intangible assets, which sanctions exacerbate by increasing the inherent uncertainty of international trade. Their proliferation raises the costs of developing operations in countries likely to be sanctioned, particularly for younger, less experienced firms with less diversified market portfolios and greater financial constraints (see, for example, Dickstein and Morales (2018) or Berman et al. (2019)). Sanctions, especially those impacting the extensive margin, thus have heterogeneous effects across sectors (e.g., depending on reliance on trade financing or insurance tools, cf. Crozet and Hinz (2020), Crozet et al. (2021)) and firm types. They may also influence trade relationships with other nations sharing similar geopolitical profiles.

4.1 Extensive Margin: Leaving vs. Staying

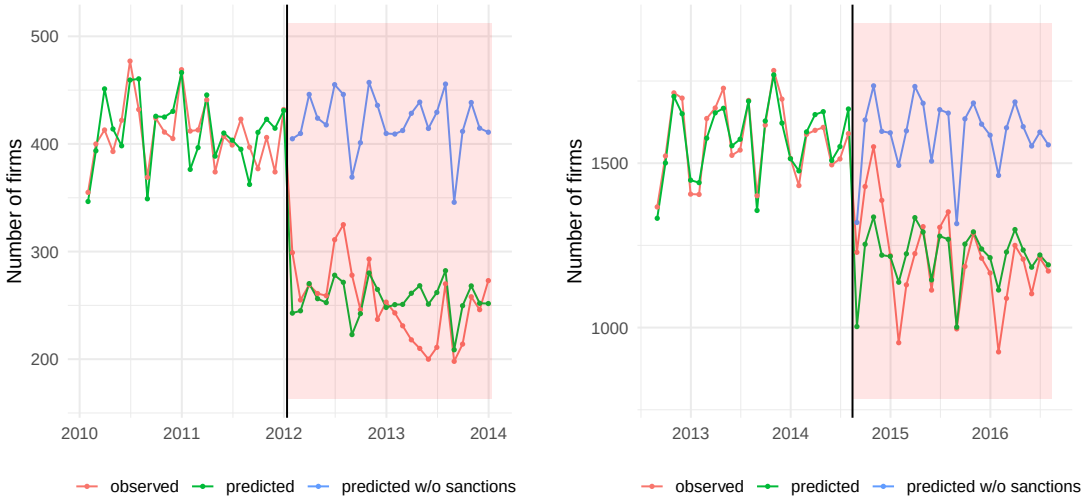
Another dimension when evaluating the impact of sanctions on trade is the split between a reduction in volumes and a complete interruption of flows. Using highly disaggregated French customs data, Crozet et al. (2021) study sanctions against Iran (2012), Russia (2014), Myanmar, and Cuba, and show that prior market experience mitigates exit, while finance intensity matters for continuation. They also document asymmetry: lifting sanctions does not simply reverse the imposition due to relationship-specific sunk costs and network re-wiring.

Investor and consumer pressures can further push exits. Around the 2022 invasion, companies that publicly remained in Russia under-performed peers that exited, consistent with an equity-market penalty (Tosun and Eshraghi, 2022). Surveys likewise suggest "self-sanctions" driven by customer perceptions (Hart et al., 2023).

4.2 Intensive Margin: Firms That Stay

For firms that continue trading, volumes typically decline. Crozet and Hinz (2020) show for French exporters during the 2014 Russia episode that most "lost trade" occurred in

Figure 7: Impact of Sanctions on the Extensive Margin of Trade (Source: Crozet et al. 2021)



(a) Iran sanctions (2012) **(b)** Russia sanctions (2014)

Notes: Observed exporters (red), model-predicted under sanctions (green), and counterfactual without sanctions (blue). The gap to the counterfactual indicates exits along the extensive margin.

non-embargoed goods—consistent with sanctions raising financing frictions and country risk, not simply banning listed products.

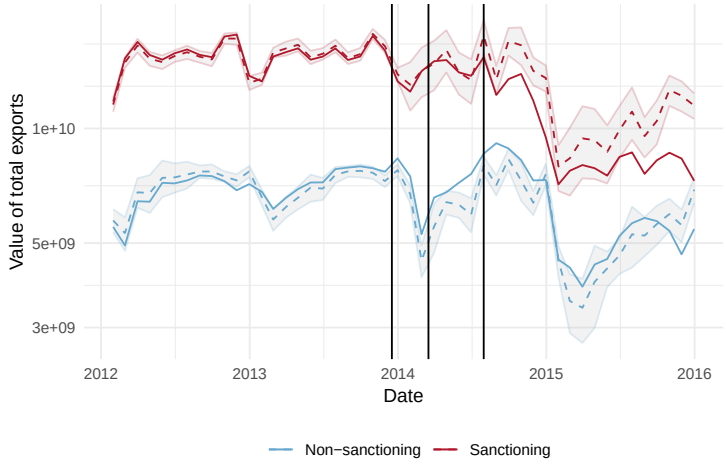
Comparable firm-level evidence exists for other senders: Germany (Görg et al., 2024), Denmark (Jäkel et al., 2023), and the Netherlands (Kohl et al., 2023) report reductions among firms remaining active, with magnitudes varying by finance intensity, product type, and pre-existing relationships.

5 Case Study: French Firm-Level Impact of the Sanctions against Russia in 2014 and 2022

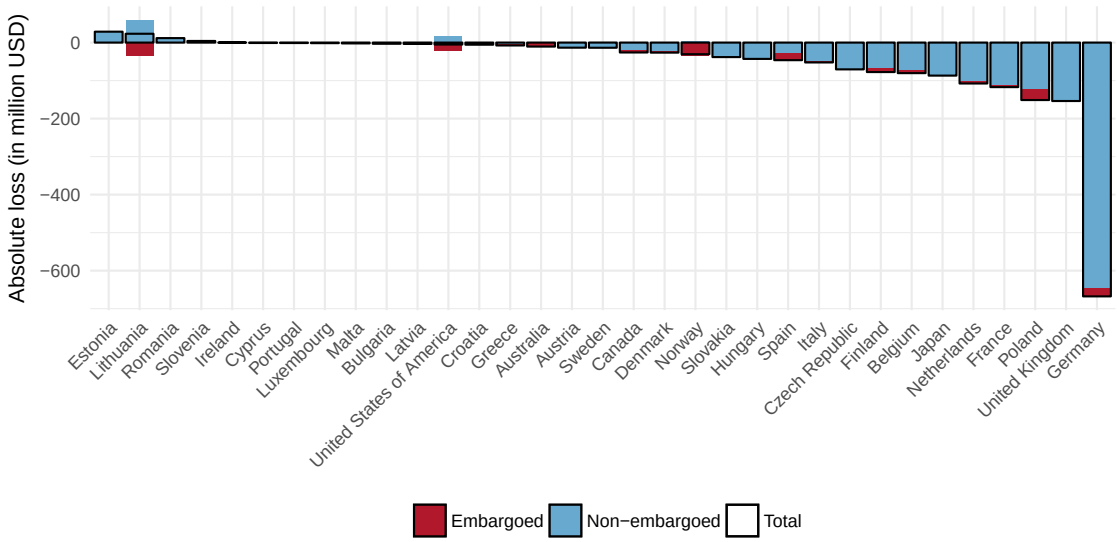
We now turn to the quantification of the impact of the 2014 and 2022 sanctions against Russia at the firm-level in a *sanctioning* country.[7]

[7]Egorov et al. (2025) provide an almost exhaustive account of the impact of the 2022 sanctions against Russia for the Russian side in an identically named paper. For their analysis they link a hand-coded sanctions dataset to Russian customs data at the firm level, firm balance sheets, domestic rail shipments, and procurement records to measure the real effects of the 2022 sanctions regime. Difference-in-differences estimates show sanctioned country–product flows to Russia fell by about 62% after February 2022 (nearly 80% by end-2023). Imports of sanctioned goods via "friendly" countries (e.g., China, Turkey) rose sharply — roughly 150% and largely through rerouting of Western goods — but did not fully offset losses: total Russian imports of sanctioned products were still down 27% through 2023. Firms that had relied on soon-to-be-sanctioned inputs experienced sizable output declines (≈14% lower revenues on average, ≈20% in science/technology; similar effects in manufacturing), weaker procurement outcomes (–2.4 pp probability of any award; –31% contract value), and negative spillovers along supply chains to their buyers and suppliers. While certain critical military components were preserved via rerouting, Egorov et al. conclude that measures materially constrained Russian production capacity and propagated economy-wide.

Figure 8: Lost Trade for Sanctioning Countries in the 2014 Russia Sanctions (Source: Crozet and Hinz 2020)



(a) Observed vs. counterfactual exports to Russia



(b) Average monthly export loss (US$ millions) by sender

Notes: The bulk of lost exports arises in non-embargoed products, consistent with finance/trust frictions binding even where trade is legally permitted.

Using French data we quantify the impact along different margins and channels. The French customs authorities provide researchers with detailed customs declarations by French firms. The data are aggregated by firm (identified via their SIREN number), product (classified under NC8), destination country (for exports), or origin country (for imports), and by month. This creates a large dataset of bilateral monthly trade flows at the microeconomic level. The data cover the period from January 1993 to December 2023, allowing for the observation of French firms' responses to several sanctions episodes. This

analysis focuses on the case of Russia in 2022[8]. Data on extra-EU trade flows are nearly exhaustive, while for intra-community flows, they are partially censored (Bergounhon et al., 2018). The vast number of observations necessitates choices for econometric analyses, such as aggregating products or destinations to manage the database's size. Specifically, for the econometric analysis below we will limit the data to the years 2021 to 2023 and aggregate product and control groups where plausible.

5.1 Margin Decomposition

Figures 9a and 9b provide an overview of over 30 years of French exports to Russia. From 1993 to 2013, French exports grew steadily, weathering the 1998 Russian financial crisis and the 2008 global financial crisis. The political tensions of 2014 and 2022, however, caused far greater trade disruptions. In 2014–15, exports fell by nearly half, a decline attributable to the conflict itself (and the associated rise in country risk), economic disruptions (a falling ruble and oil prices), EU sanctions, and the Russian agricultural embargo. Trade subsequently resumed its upward trend, suggesting much of the decline was driven by temporary instability. By early 2022, French exports had nearly recovered to their 2013 peak. The trade collapse in 2022, however, was unprecedented in its speed and depth. Within a month, approximately two-thirds of French exports vanished, falling to their 1998 levels.

The total exported value can be decomposed into an extensive margin (the number of exporting firms) and an intensive margin (the average value per flow). The shock of February 2022 is particularly striking on the extensive margin (Figure 9b). While the 2014 crisis reduced the number of exporters from approximately 2,000 to 1,500, the 2022 crisis saw this figure plummet from 1,200 to just over 300—a level not seen since before 1993. It is notable that even as export values rebounded between 2015 and 2021, the number of exporters continued to decline.

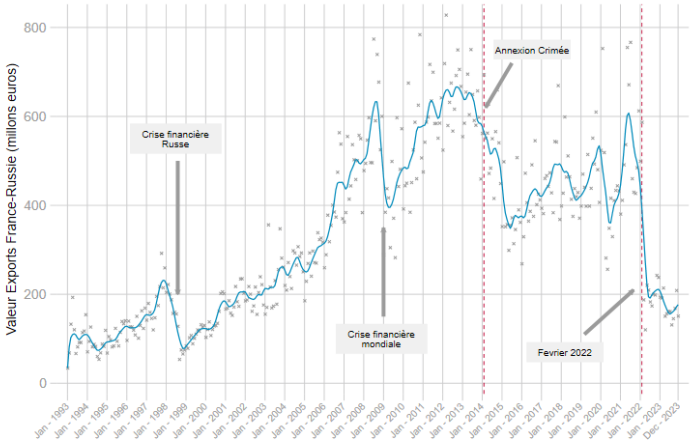
Conversely, the average intensive margin shown in Figure 9c increased sharply after February 2022. This should not be interpreted as larger exports by continuing firms; rather, it is a composition effect. Smaller firms tended to exit the market abruptly, meaning those that continued exporting were, on average, larger to begin with. Our econometric results confirm that these remaining firms also reduced their individual export volumes.

This pronounced shift toward an extensive-margin adjustment is significant. On one hand, it suggests that French exporters perceived the 2022 rupture as deeper and more durable than that of 2014, likely reflecting heightened geopolitical risks beyond the sanctions themselves. On the other hand, it implies that any potential return to normalcy will be slow and arduous, as severed trade networks are costly and time-consuming to rebuild

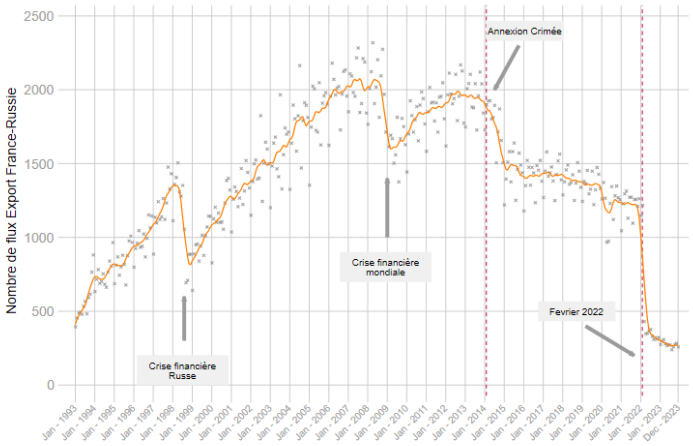
[8] See Crozet and Hinz (2020) for an analysis of the 2014 Russian sanctions and Crozet et al. (2021) for studies on sanctions against Iran and Myanmar.

Figure 9: 30 Years of French Exports to Russia

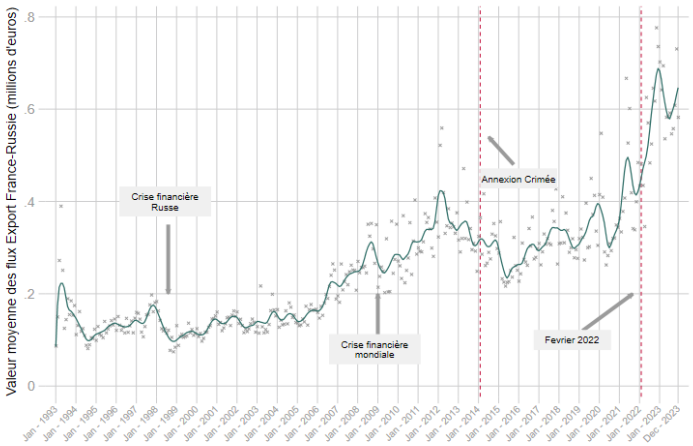
(a) Current Export Values



(b) Extensive Margin (Number of Flows)



(c) Average Intensive Margin (Value per Flow)

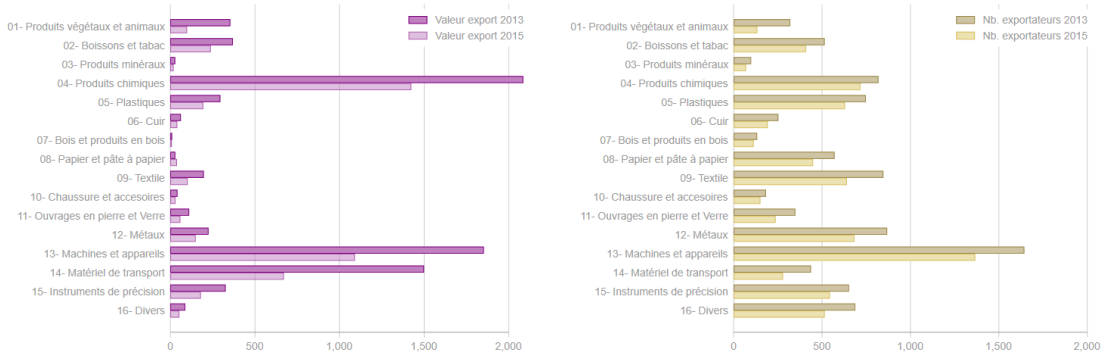


Source: Authors' calculations, French customs data

(see Crozet et al., 2021; Aytun et al., 2024).

Figure 10: The Decline in French Exports to Russia—2014

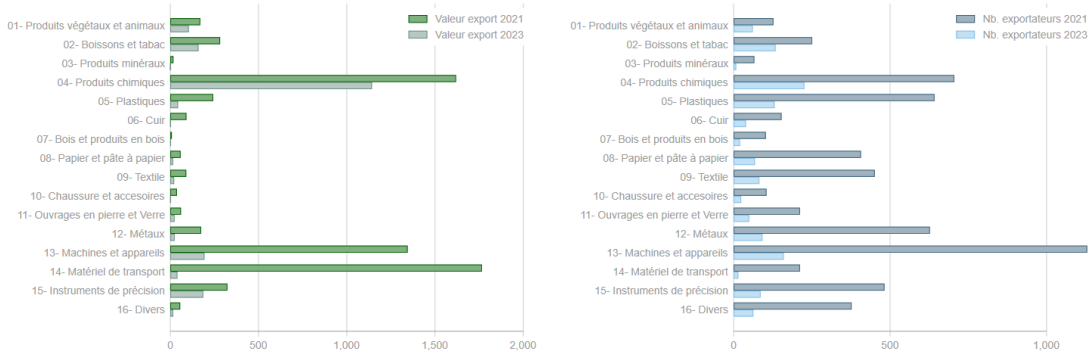
(a) Values **(b)** Number of Exporters



Source: Authors' calculations, French customs data

Figure 11: The Decline in French Exports to Russia—2022

(a) Values **(b)** Number of Exporters



Source: Authors' calculations, French customs data

5.2 Methodology

In order to identify the impact of the sanctions regime on the observed overall effects, we turn use a triple difference setup to control for unobservable factors specific to each firm, product, destination, and time period. We estimate the following equation:

$$Trade_{ikdt} = \alpha \cdot Treatment_{dt} + \theta_{ikt} + \theta_{ikd} + \varepsilon_{ikdt}$$

where indices i, k, d, t denote firm, product, destination, and date, respectively. The high-dimensional fixed effects θ_{ikt} (firm-product-date) and θ_{ikd} (firm-product-destination) absorb unobserved shocks to a firm's export capacity and time-invariant aspects of a firm's relationship with a market. The variable of interest, $Treatment_{dt}$, is an indicator for flows to Russia after February 2022. We estimate the impact on the total trade value (PPML), the

intensive margin (OLS on log values), and the extensive margin (LPM on a binary trade indicator).

The results in Table 2 (rows 1–3) confirm a sharp decline in French trade with Russia. The coefficient of -1.369 implies that, on average, a given firm's exports to Russia were 74.6% lower from March 2022 to December 2023 compared to 2021.[9] This decline is driven far more by the extensive margin than the intensive one. While the value of persisting trade flows fell by a modest but significant 25.5%, the probability of exporting in any given month dropped by 0.258, a 76.8% reduction relative to the 2021 baseline average probability of 0.34.[10]

Table 2: Impact of the 2022 Russia Sanctions on French Firms' Exports

	Margin	Treatment	Coefficient	Std. Error
(1)	Total	Russia-2022	-1.369a	(0.347)
(2)	Intensive	Russia-2022	-0.294a	(0.017)
(3)	Extensive	Russia-2022	-0.258a	(0.002)
(4)	Total	Russia-2022/23	-1.544a	(0.381)
(5)	Intensive	Russia-2022/23	-0.354a	(0.014)
(6)	Extensive	Russia-2022/23	-0.267a	(0.001)

Notes: Fixed effects: Firm-Product (HS4)-Destination and Firm-Product (HS4)-Date. Monthly data (2021–2022) and (2021–2023) for rows (4) to (6). Models: PPML (Total), OLS (Intensive Margin), LPM (Extensive Margin). Clusters: Firm-product. [a] indicates 1% significance level.

Figure 12 presents the dynamic results, plotting the estimated coefficients for each margin on a monthly basis from 2021 through 2023. The coefficients are estimated relative to the baseline month of February 2022, which is omitted.

For the total trade value (Panel (a)), the stable, non-trending coefficients throughout 2021 act as a placebo test, supporting the assumption that the sharp decline in 2022 resulted from an exogenous shock rather than a pre-existing trend. This lack of a pre-trend also suggests that the geopolitical events and their commercial consequences were largely unanticipated by firms. The drop is immediate and remains remarkably stable through December 2023. This stability suggests that while the initial shock drove the drop, the persistence of the effect was not primarily driven by the subsequent, incremental tightening of sanction packages.

Panels (b) and (c) decompose this effect. The intensive margin (Panel (b)) shows a sharp initial drop, followed by a brief recovery, and then a gradual decline, stabilizing around

[9] The effect is computed as $1 - exp(-1.369) \approx 0.746$.

[10] Note that to reduce the datasets' size, the control group is restricted to European countries imposing sanctions, aggregated into two groups: Nordic and Central European countries, and Western European countries. Similarly, in our baseline specification, products are aggregated at the 4-digit level of the Harmonized System (HS4) classification while distinguishing between products explicitly targeted by EU sanctions and others. The observation period is limited to 2021–2023. The resulting database contains over 32 million observations and roughly 9 million when excluding zero flows.

22% below 2021 levels. Firms that maintained their relationships with Russia initially appeared to pause shipments amid acute military uncertainty before subsequently fulfilling pre-existing orders, eventually settling at a lower level of engagement. In contrast, the extensive margin (Panel (c)) shows a sharp, permanent drop. Firms that exited the market did so decisively and did not return. This highlights two distinct firm responses: a definitive exit by one group, and a cautious continuation by another.

This analysis illustrates the shock's magnitude but does not disentangle its causes, which could include: de-risking by firms, a Russian economic slowdown, boycotts, reputational concerns, financing disruptions, or the direct effect of sanctions. Isolating the role of sanctions requires further steps.

5.3 Targeted vs. Non-targeted Products

A more precise approach to assess sanctions' impact is to compare products explicitly targeted by EU export bans with those that are not. We use the product list compiled by Chupilkin et al. (2025b), which is based on EU regulations covering dual-use and other strategic goods.[11]

Figure 14 provides a descriptive overview. In 2021, sanctioned products accounted for just over half of French export value to Russia. While the chart shows a steep decline for both sanctioned and non-sanctioned goods, with no immediately obvious differential impact, our econometric results confirm that targeted products were indeed more severely affected. By interacting our treatment variable with an indicator for sanctioned products, we can formally test for this differential reaction.

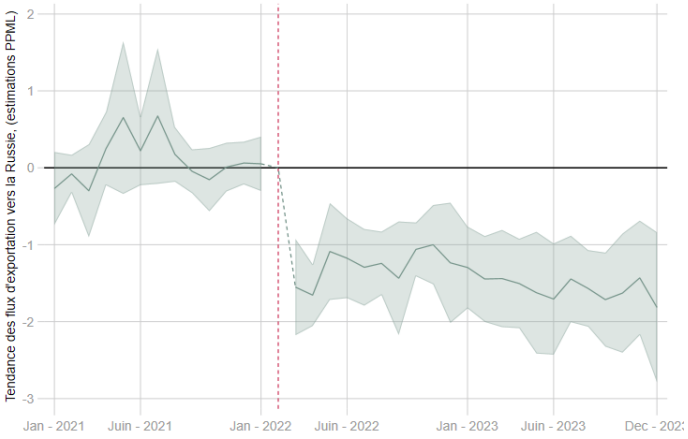
The econometric estimates in Table 2 (rows 7 to 9) quantify this differential impact. The effect on total export value is stark: after February 2022, the value of exports of non-targeted products fell by about 50% ($1 - \exp^{-0.677}$), whereas exports of sanctioned products fell by over 86%. This difference is driven primarily by the intensive margin (a larger reduction in flow values) rather than the extensive margin (where the difference in exit probability is not statistically significant). Figure 15 details the differential impact on products targeted by sanctions. For export values, the gap emerges immediately after February 2022 and remains constant, showing no further reaction to subsequent sanctions packages.

We can further distinguish between dual-use items and other sanctioned goods (e.g., luxury items, mining equipment). Table 2 (rows 10 to 12) reveals a clear hierarchy: the decline is most severe for dual-use products (a drop of nearly 94%), followed by other sanctioned

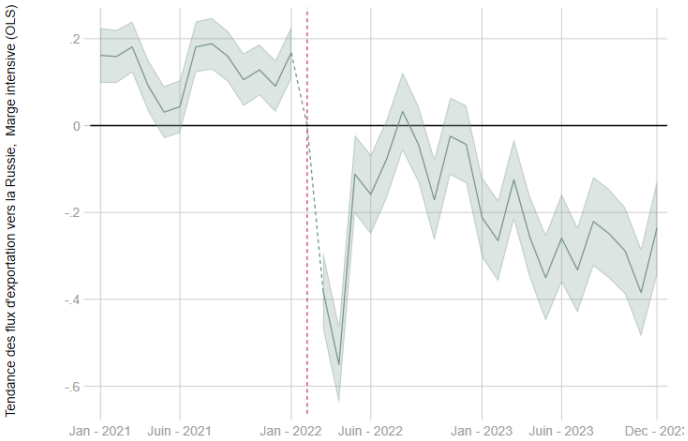
[11] Products are defined at the six-digit level of the HS classification. The list is based on a review of European regulations, including Council Regulation (EU) No 833/2014 of 31 July 2014 concerning restrictive measures in response to Russia's actions destabilizing the situation in Ukraine, as well as the list of dual-use products, Regulation (EU) 2021/821 of the European Parliament and Council of 20 May 2021 establishing an EU regime for the control of exports, brokering, technical assistance, transit, and transfers of dual-use items.

Figure 12: Estimation of the impact of the 2022 conflict on French exporters to Russia

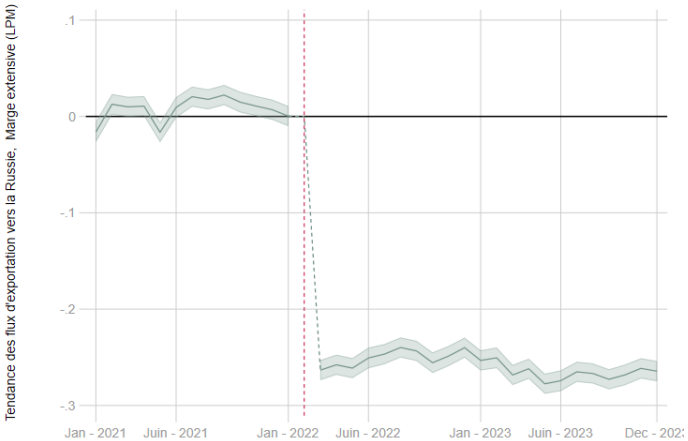
(a) Total



(b) Intensive margin
(values, excluding interruptions)



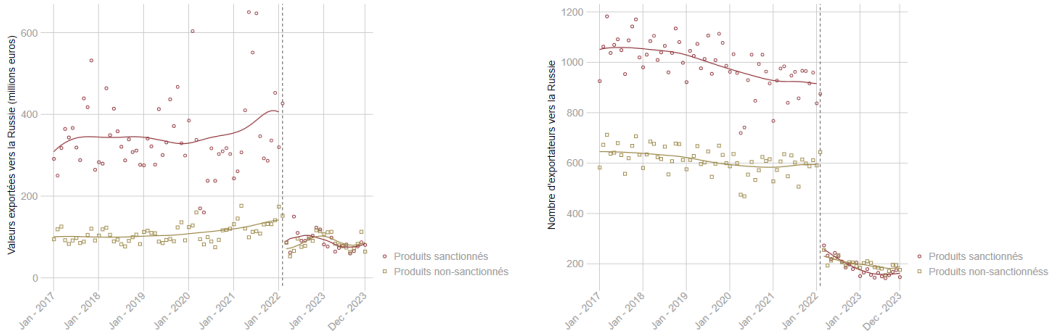
(c) Extensive margin
(probability of exporting)



Source: Authors' estimations, French customs data

Figure 13: Evolution of exports to Russia for targeted and non-targeted products

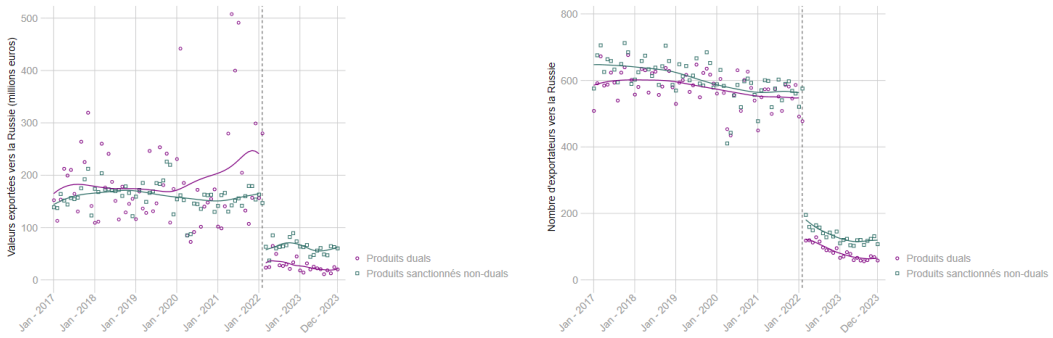
(a) Value **(b)** Number of exporters



Source: Authors' calculations, French customs data

Figure 14: Evolution of exports to Russia for dual-use and other sanctioned products

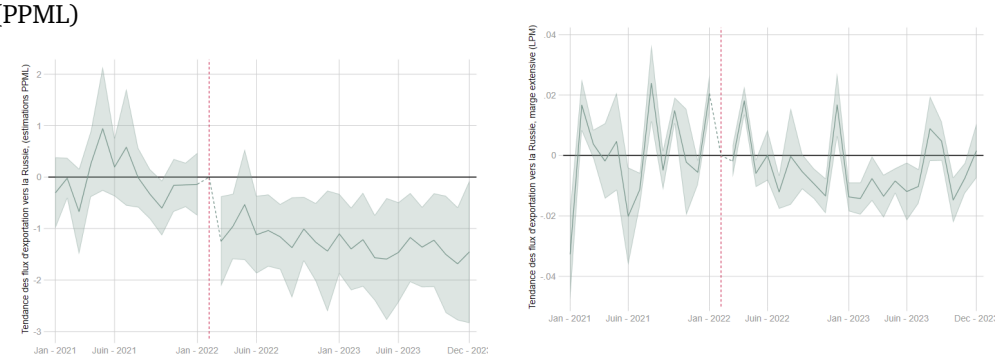
(a) Values **(b)** Number of exporters



Source: Authors' calculations, French customs data

Figure 15: Overreaction of targeted product exports

(a) Export value, including interruptions (PPML) **(b)** Probability of exporting (LPM)

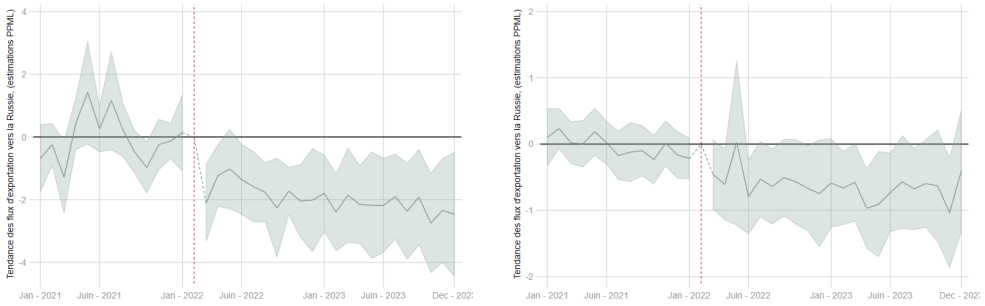


Source: Authors' calculations, French customs data

products (-72%), and finally non-sanctioned products (-50%). Once again, this hierarchy is driven by adjustments on the intensive margin.

Figure 16: Overreaction of targeted product exports: dual-use vs other goods (Values, PPML)

(a) Sanctioned Dual-Use Products **(b)** Sanctioned Non-Dual Products



Source: Authors' calculations, French customs data

5.4 Trade Diversion and Circumvention

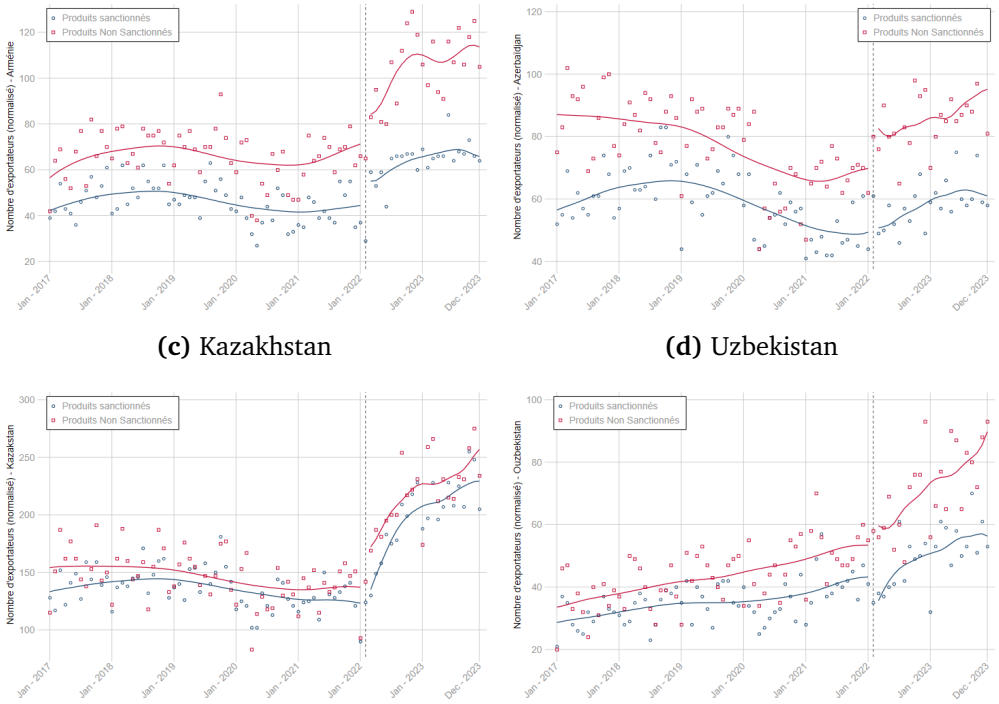
The potential circumvention of sanctions is a major concern. This could occur—particularly for multinational groups—through the use of subsidiaries located in countries not participating in sanctions against Russia, or by redirecting flows to non-sanctioning countries where intermediaries can handle re-exports to Russia. Many cases have been identified, and some examples have been publicized. Chupilkin et al. (2025b) provides a more systematic analysis, exploiting bilateral trade data by product. These authors confirm a clear diversion effect, identified by a noticeable increase in imports of Western products in countries bordering Russia, especially dual-use goods specifically targeted by sanctions.

This trend is also observed in individual French data. Figure 17 shows the number of firm-product pairs exporting to four countries near Russia that are highly likely to serve as hubs for diversion: Armenia, Azerbaijan, Kazakhstan, and Uzbekistan. A sudden interest in these destinations is evident starting in February/March 2022. By contrast, the suspicion of diversion is far less perceptible for China, India, and Turkey (Figure 18). However, these countries are major trading partners for France, and the entry of a few new exporters prevented from trading with Russia is inevitably diluted in the volume of trade flows.

Our econometric analysis confirms these patterns. We perform a triple difference analysis comparing firms with prior exposure to the Russian market to those without. We estimate the evolution of French firms' exports to each country neighboring Russia, comparing both the trend from 2021 to the post-February 2022 period and the trends of exports to other European destinations (excluding Russia, Belarus, and Ukraine). The third difference distinguishes between "non-exposed" exporters and "exposed" exporters. The latter refers to firms that exported to Russia within the 14 months preceding February 2022. The countries analyzed are Armenia, Kazakhstan, Azerbaijan, Tajikistan, Uzbekistan, Georgia,

Figure 17: Evolution of the number of French exporters to countries bordering Russia

(a) Armenia **(b)** Azerbaijan



(c) Kazakhstan **(d)** Uzbekistan

Source: Authors' calculations, French customs data

Turkmenistan, and Turkey.[12] Given that the main countries likely to serve as hubs for trade diversion are modest-sized economies located far from France, French exports to these destinations are relatively sporadic.

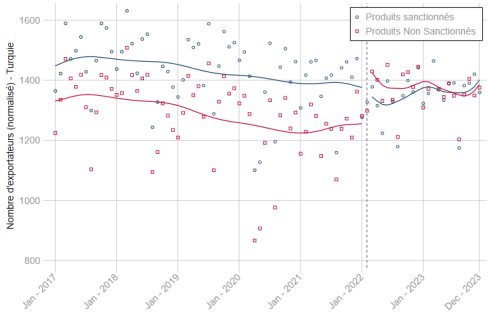
The econometric estimates are presented in graphical form in Figure 19 for the value of flows (extensive and intensive margins) and in Figure 20 for the extensive margin (probability of exporting). The results are particularly insightful. The analysis of the value of flows shows significant results for Armenia, Uzbekistan, and Turkey. The results for the probability of exporting are even more striking, revealing a very clear increase in the presence of exposed firms in all destinations except Turkmenistan. French exporters that had shipped their products to Russia before the 2022 war have clearly increased the frequency of their exports or started exporting to diversion countries.

These results clearly indicate that firms reducing or halting their exports to Russia redirected part of their flows to neighboring countries. However, it should be noted that this is not sufficient to claim that they deliberately circumvented sanctions. There is no direct evidence in French customs statistics that these new exports to Central Asia were re-exported to Russia, and nothing excludes the possibility that firms losing their Russian market made greater efforts to find alternative markets for their products.

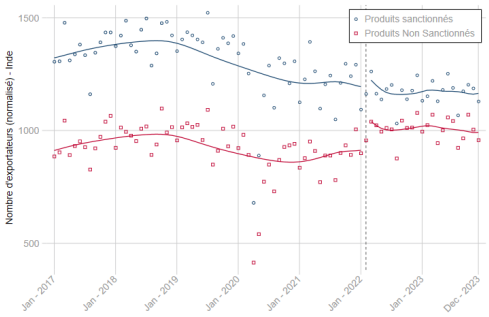
[12]The results for India and China do not show significant changes.

Figure 18: Evolution of the number of French exporters to other potential diversion countries

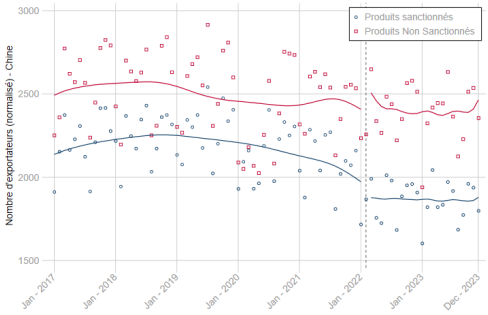
(a) Turkey



(b) India



(c) China



Source: Authors' calculations, French customs data

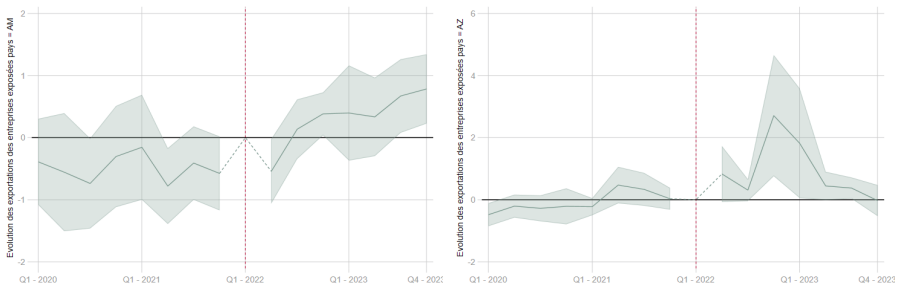
6 Financial Effects of Trade Sanctions and Trade Effects of Financial Sanctions

The impact of trade sanctions propagates through financial links and capital markets beyond direct trade flows. Using German balance-of-payments microdata, Besedeš et al. (2021) find marked reductions in financial activities with sanctioned countries by non-financial firms, alongside redirection toward non-sanctioned partners—yet limited immediate effects on employment or total sales, suggesting short-run adaptation on the finance margin. Equity markets also embed these shocks: firms with higher Russia exposure saw lower cumulative returns around the 2022 invasion, particularly where commodity dependence was high (Biermann and Leromain, 2023).

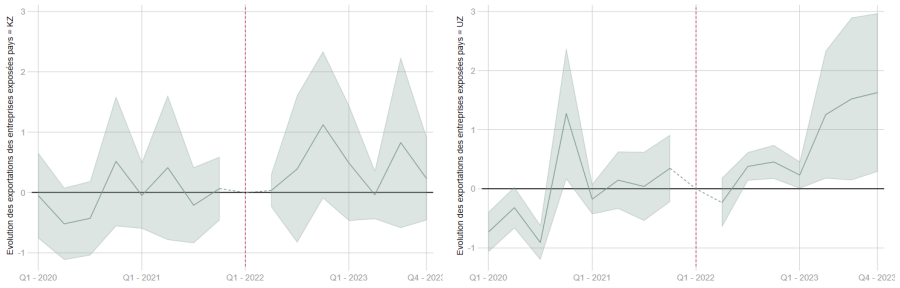
Not only do trade sanctions have effects in financial markets, but financial sanctions powerfully drive observed trade effects of accompanying trade sanctions. Targeted financial sanctions impose extensive monitoring costs on all international payments, creating friction for firms not directly targeted by trade sanctions. Crozet and Hinz (2020) show that the 2014 Russia sanctions had a significant negative impact on overall trade relations, even for non-sanctioned products, as displayed in Figures 8a and 8b. The effect was most

Figure 19: Trade Diversion: Value of Individual Flows

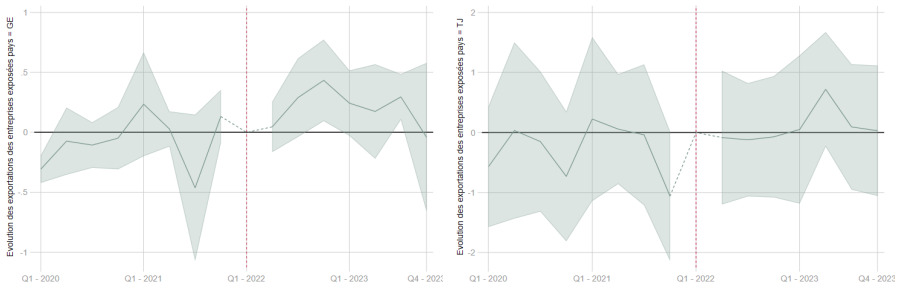
(a) Armenia **(b)** Azerbaijan



(c) Kazakhstan **(d)** Uzbekistan



(e) Georgia **(f)** Tajikistan



(g) Turkmenistan **(h)** Turkey

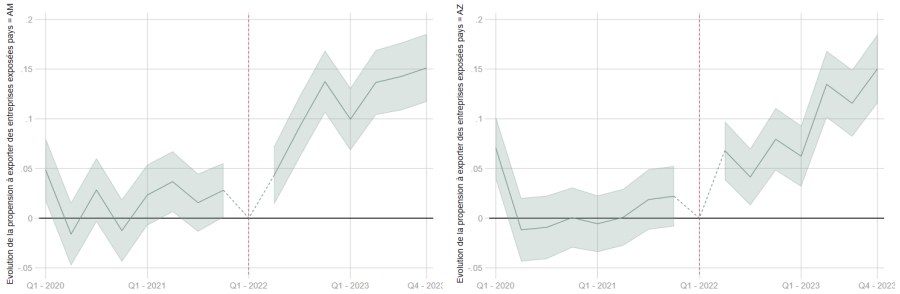


Source: Authors' calculations, French customs data

pronounced for goods reliant on external financing and trade insurance, pointing to frictions generated by financial transaction sanctions as a key channel (Corsetti et al., 2025).

Figure 20: Trade Diversion: Extensive Margin

(a) Armenia **(b)** Azerbaijan



(c) Kazakhstan **(d)** Uzbekistan



(e) Georgia **(f)** Tajikistan



(g) Turkmenistan **(h)** Turkey



Source: Authors' calculations, French customs data

7 The Limits of "Smart" Sanctions

Sanctions aim to influence political decisions or hinder specific economic capacities. Hence, ideally, sanctions are targeted to maximize pressure on decision-makers while sparing innocent populations and minimizing costs for sanctioning countries. This doctrine of

"smart" or "targeted" sanctions has guided policy since the 1990s. However, the expectation that targeted sanctions can avoid collateral damage while remaining effective is widely considered unrealistic (Tostensen and Bull, 2002, e.g.).

Targeted sanctions include visa bans, asset freezes, restrictions on specific banks, and — in terms of trade sanctions — prohibitions on strategic products. In practice, measures aimed at a few individuals have limited leverage, and few measures successfully hit only their intended targets. This is due to two primary factors: (*i*) externalities, where shocks inflicted on specific targets ripple through the rest of the economy, and (*ii*) the ability of political authorities in the targeted country to compensate for losses, thereby shifting the burden of sanctions onto other actors.

7.1 Shields and Collateral Victims

Efforts by governments to protect targeted firms often result in a protective shield that rarely provides complete immunity but instead redirects sanctions to other actors who were expected to be spared.

This phenomenon is clearly illustrated in Ahn and Ludema (2020), examining the 2014 sanctions on Russia. Using records of Russian firms and individuals specifically designated by individual measures, the study compiles a list of nearly 3,000 firms or subsidiaries explicitly or indirectly sanctioned (e.g., due to majority ownership by sanctioned individuals or high dependency on imports from Western countries).[13] The results show a significant impact: on average, a targeted firm loses about one-quarter of its operating revenue, more than half its asset value, and approximately one-third of its employees compared to non-targeted comparable firms. The study also identifies a subgroup of firms publicly labeled by Russian authorities as "strategic" entities requiring support. These firms were largely shielded from the effects of sanctions, likely due to substantial government aid. This finding highlights the limitations of targeted sanctions. Public support for strategic firms is not free—it takes the form of subsidies, concessional loans, or public contracts. Thus, while the ability of a sanctioned government to support its targeted firms does not signify a failure of sanctions, it undermines the notion of targeted sanctions. The defensive measures of the sanctioned country redirect economic restrictions to a broader economic base: taxpayers (funding the subsidies), consumers (paying higher prices), and other firms (facing competition for credit access).

Nigmatulina (2023) arrives at a similar conclusion. Using detailed accounting data from a large sample of Russian firms, the study finds that firms explicitly targeted by 2014 Western sanctions did not experience reduced activity. On the contrary, these firms significantly increased their sales and capital relative to comparable firms, largely due to public contracts. However, this protection proved costly for Russia. Targeted

[13] These firms are not exclusively in Russia; many are located in other countries.

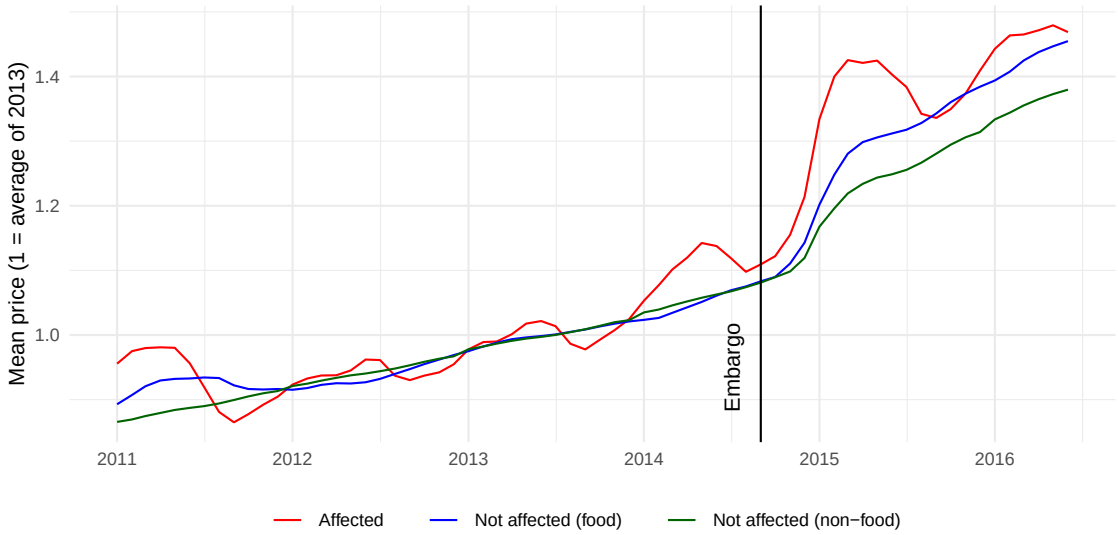


Figure 21: Average Prices of Embargoed vs. Non-Embargoed Products after Russia's 2014 Embargo (Source: Hinz and Monastyrenko (2022))

firms, already prone to overcapitalization and low productivity, further solidified their position in the Russian economy, reducing the overall efficiency of the production system. Nigmatulina (2023) estimates that sanctions and accompanying countermeasures led to a 1.1% productivity loss at the national level. Ultimately, the study concludes that "smart" sanctions missed their target and made the broader Russian economy a collateral victim.

Conversely, Draca et al. (2023) concludes that sanctions on Iran were more effective (or, rather, that the Iranian government's protective measures were less effective). The paper examines the Tehran Stock Exchange's reaction to announcements of progress in lifting sanctions. Unsurprisingly, such positive news triggered a rise in stock prices. Notably, the gains were significantly greater for firms owned by elites close to the government (such as Ali Khamenei and leaders of the Islamic Revolutionary Guard Corps).

7.2 Consumer Prices and Collateral Damage

As discussed above, trade diversion and supplier switching impose direct costs on the target country's population via higher import prices. In Russia's 2014 agricultural embargo on Western goods, for example, city-level price data show that the prices of embargoed goods rose by 7.7–14.9% in the short run and 2.6–8.1% on average over the longer term. Input-output linkages also caused spillover price increases for non-embargoed goods (Hinz and Monastyrenko, 2022). A quantitative trade model built to analyze this episode implies a welfare loss of about 1.84% for Russia, with an overall CPI impact near 0.33%, consistent with the micro-price evidence. This demonstrates how even a counter-sanction, intended as a retaliatory measure, ultimately imposes a significant and untargeted burden on domestic consumers, serving as another example of widespread collateral damage.

8 Political Outcomes

The primary objective of sanctions are to change political outcomes. Hence, in the end, evaluating the effect of trade sanctions ultimately means studying their technical effectiveness: To what extent has a sanctions regime weakened the targeted regime. This question is critical because the expected outcome is ambiguous.

8.1 Popular Revolt, Elite Rebellion, and the Rally-Around-the-Flag Effect

On the one hand, it is reasonable to hope that populations bearing the economic burden of sanctions will develop resentment and mobilize to demand that their leaders change policies or step down.[14] This effect, however, is not guaranteed and can vary in intensity depending on the political regime. The economic cost imposed by sanctions is likely a stronger incentive for policy change when leaders are sensitive to public opinion. This is typically true of democracies (Marinov, 2005), but also of some illiberal regimes—either because they rely heavily on a broad popular base (e.g., populist, agrarian, ethnic, or religious governments) or because their ability to suppress popular dissent is limited.[15]

Conversely, the economic burden imposed by foreign powers could foster a sense of victimization and ultimately strengthen national cohesion around political leaders (the "rally-around-the-flag" effect). This backlash effect may stem from a spontaneous rise in nationalist and patriotic sentiments, a media-driven denigration of foreign adversaries, or increased repression of domestic opposition.

Empirical analyses show that the intensity of these two mechanisms depends on the nature of the sanctions (e.g., "smart" sanctions or broader restrictions)[16], and especially on the type of political regime. Studies by Marinov (2005) and Escribà-Folch and Wright (2010) estimate the impact of international sanctions on the likelihood of targeted governments being forced out of power. Unsurprisingly, they find that non-democratic regimes are more resilient. Escribà-Folch and Wright (2010) specifically highlights that this is especially true for military regimes or single-party states. In these systems, power is maintained through the allocation of national resources to support groups directly aligned with the government. The economic impact of sanctions on elites is thus neutralized through intensified predation and repression. In contrast, "personalist" dictatorships and autocratic regimes centered

[14] Firms must also decide whether to follow the choices made by their political leaders. Weber and Stepien (2020) conceptualize this problem by distinguishing between a "Conformance" strategy (to adapt to sanctions) or a "Challenge" strategy (to be opposed to sanctions). Among other determinants, market and resource dependency induces strategies that challenge sanction policies. Institutional factors in the form of administrative burdens have the opposite effect.

[15] For example, this may be the case in China, where non-linear effects are evident. Popular discontent can remain politically inconsequential as long as it is diffuse and localized, but it can induce significant and rapid changes once the dissent becomes entrenched and widespread. The abrupt abandonment of the zero-COVID policy illustrates this dynamic.

[16] Marinov (2005), for instance, notes that the threat of violence tends, all else being equal, to increase the likelihood of governments staying in power.

on smaller clans are more likely to struggle with managing popular discontent. More specifically, the econometric results of Escribà-Folch and Wright (2010) show that sanctions tend to increase the likelihood of regime change in personalist dictatorships but reinforce the stability of military regimes.

It is worth noting that these empirical studies, which span numerous countries and long time periods, remain fragile and often struggle to establish truly causal relationships. Clearly, sanctions are not imposed randomly, making it difficult to disentangle the effects of sanctions from the events that prompted their imposition. A government may fall due to international sanctions, but equally likely due to pre-existing internal movements motivated by the political choices or crises condemned by the international community. Similarly, foreign nations may impose sanctions precisely when they perceive that the targeted regime is showing signs of weakness, aiming to bolster an existing opposition movement.

Nonetheless, some studies offer more robust analyses. Grossman et al. (2018) conducted a controlled experiment based on a series of surveys of the Israeli population. They found that Israeli voters were more likely to support the incumbent government when reminded of the EU's 2015 decision to impose specific labeling on products manufactured in occupied territories. This result clearly challenges the general notion that democracies are vulnerable to sanctions while illiberal systems are better equipped to generate backlash by rallying their political support bases. Even in democracies, rally-around-the-flag effects can be observed.

8.2 The Impact of Western Sanctions on Russian Public Opinion

Two recent studies have examined the impact of Western sanctions on Russian public opinion, as expressed in elections outcomes. These studies analyze the period after the annexation of Crimea and the following sanction from Western countries in 2014. To accurately evaluate the political impact of the imposed sanctions, it is necessary to distinguish their effects from the broader political and economic disruptions affecting the targeted country.

Gold et al. (2023) investigate the reaction of the Russian population to the 2014 sanctions. They causally relate election results—both parliamentary and presidential—across Russian regions with those regions' levels of exposure to sanctions, measured by estimated losses in international trade. They identify a pronounced rally-around-the-flag effect: support for the regime significantly increases with higher levels of sanction exposure. This effect is substantial, though, given the overwhelming dominance of the ruling party, it had no noticeable impact on the country's broader political balance.

In a similar vein, Peeva (2022) links election results from various Russian polling stations

to the proximity of sanctioned enterprises (in 2014). She demonstrates that areas hosting a sanctioned enterprise saw an increase in votes for Vladimir Putin. Using survey data, she also finds that patriotic sentiment is stronger in these areas, particularly among individuals whose primary source of information is state television.

9 Conclusion

Sanctions have become a structural feature of the global economy. Our synthesis shows that, at the macro level, broad coalitions can impose sizable costs on targets at relatively modest average costs to senders, with heterogeneity concentrated in small, highly exposed economies. Quantitatively, the 2022 regime against Russia imposed welfare losses an order of magnitude larger on the target than on a typical EU member, and counterfactuals clarify both the limited marginal role of individual large senders once coalitions are in place and the upper bounds from tighter embargoes or universal participation.

At the micro level, sanctions bite mainly through the extensive margin: many firms exit, and those that remain trade less. Targeted export controls (especially on dual-use goods) reduce flows more than non-targeted products, yet financial restrictions and heightened risk affect otherwise legally permitted trade. Diversion and possible circumvention redirect part of the trade to nearby non-participants, raising enforcement questions.

In general sanctions design is crucial, as the intended "smart" sanctions face inherent limits: Governments can shielding strategic firms from direct effects while shifting costs to taxpayers, consumers, and non-privileged firms in the sanctioned economy. And finally, importantly, political responses are context-dependent: The 2014 Russia sanctions appear to have triggered rather rally-around-the-flag dynamics than a weakening of the political regime in Russia.

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