OLEG ITSKHOKI
Harvard University

ELINA RIBAKOVA
Peterson Institute for International Economics

The Economics of Sanctions: From Theory into Practice

ABSTRACT This paper examines the effectiveness of economic sanctions imposed on Russia, particularly following its 2022 full-scale invasion of Ukraine. Despite the unprecedented scope and scale of these sanctions, their impact on Russia's economy has been mixed, with only moderate contraction reported by official Russian statistics. We combine an empirical assessment of these sanctions with the development of a theoretical framework to better understand the complexities and trade-offs in their application. Sanctions, while a critical tool of economic statecraft, are not a guaranteed solution to end wars or alter a country's behavior. To impose effective costs, we advocate for a comprehensive, technocratic approach with clear, measurable objectives, rather than a piecemeal strategy. The efficacy of sanctions depends on factors such as the target country's size and global integration, the sanctioning coalition's unity, the ability to enforce sanctions, and the economic burden on sanctioning nations. The paper underscores the importance of realistic expectations and careful design of sanctions policy on trade, finance, and payment systems.

Economic statecraft, including measures such as blockades and trade suspensions, has seen a resurgence in recent years. This is likely due to a combination of factors: on one hand, the recognition of the limits of hard

Conflict of Interest Disclosure: The authors did not receive financial support from any firm or person for this paper or from any firm or person with a financial or political interest in this paper. The authors are not currently an officer, director, or board member of any organization with a financial or political interest in this paper. The discussant, Rory MacFarquhar, is the chief economist of Gemsstock, an investment firm that has at times owned Ukrainian and Russian securities.

Brookings Papers on Economic Activity, Fall 2024: 425–470

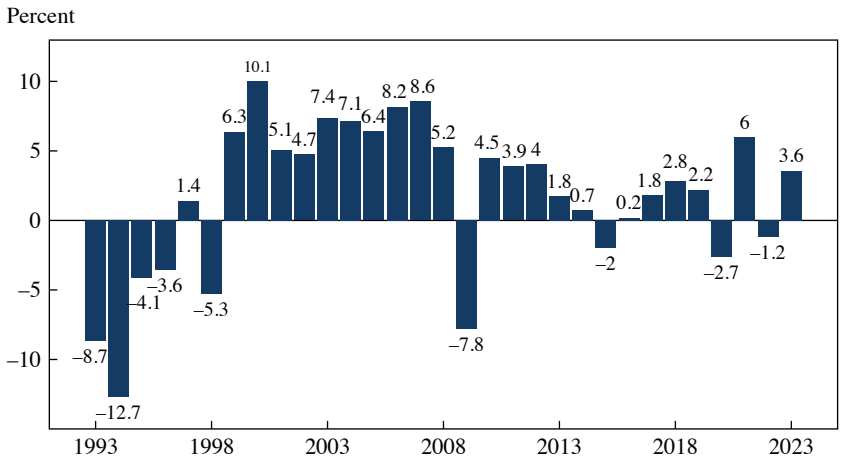
military power following the wars in Iraq and Afghanistan; on the other hand, the institutional capacity built up during the war on terror and the realization of the power stemming from the United States' centrality in the global financial system. While the post–Cold War era saw a decline in the use of economic statecraft, concerns over geopolitical tensions, particularly with China and Russia, have revived interest in leveraging economic tools for foreign policy objectives. This shift has led to a reevaluation of multilateral frameworks such as the World Trade Organization and Bretton Woods institutions, with nations increasingly prioritizing economic sovereignty and adopting more assertive stances in international trade and finance. Even the European Union (EU), which traditionally advocated for strict compliance with multilateral rules on global trade and finance, has recently moved toward a more geopolitical approach, reflecting a global trend of balancing economic goals with broader strategic interests.

The concept of economic statecraft encompasses a range of measures much broader than traditional financial sanctions, including export controls and trade embargoes. Since Russia's invasion of Crimea in 2014, sanctions have been a primary tool in Western coercive diplomacy, leveraging Russia's integration into global financial markets. Although these initial sanctions failed to force Russia to backtrack, they likely contributed to its decision not to advance farther in 2014, avoiding the risk of additional financial sanctions for which Russia was unprepared at the time. The 2022 full-scale invasion of Ukraine marked a turning point, with a coalition of countries imposing unprecedented sanctions, including export controls and restrictions in key sectors such as energy. This multipronged approach reflects a concerted effort to undermine Russia's ability to pursue the war and communicate a strong disapproval of its actions.

Nonetheless, it is important to clearly distinguish between sanctions *in theory* and sanctions *in practice*, with enforcement being the key difference. While sanctions may exist on paper, weak enforcement renders them ineffective. Moreover, "black knights" (Timofeev 2023) have been aiding Russia in circumventing these sanctions, further highlighting the gap between theoretical measures and their practical impact.

The 2022 sanctions on Russia have not been an unequivocal success (Council of Economic Advisers 2023; Demertzis and others 2022). First, communication about the objectives of the sanctions was unclear both before and after the full-scale invasion in February 2022. On the one hand, it appeared that the authorities tried to pursue multiple objectives at the same time; on the other hand, and likely as a result, government communication to the public regarding the sanctions and the assessment

Figure 1. Russian Real GDP Growth



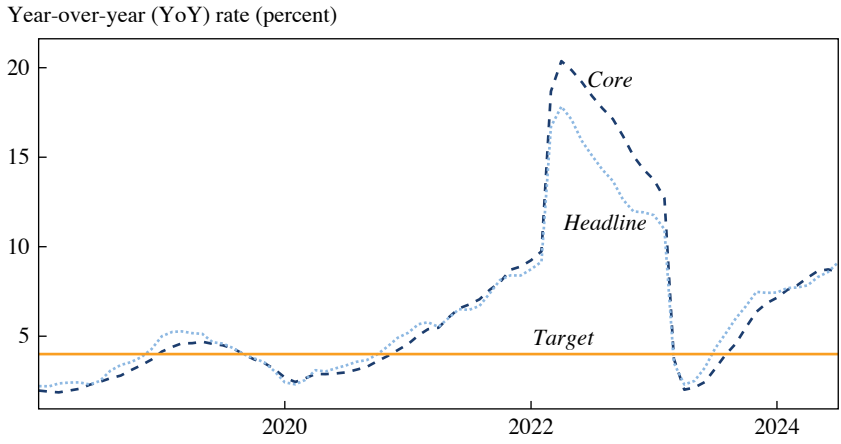
Source: International Monetary Fund (2024) and KSE Institute.

of their outcomes during the early months of the war was inconsistent. Second, seeking complete isolation from a large, complex, and globally integrated economy is costly and likely unattainable (Ribakova 2024a). As a result, some governments did not want to pursue such a goal and Russia's oil continued to flow freely to the market. It took coalition governments almost a year to reduce purchases of Russia's oil and gas—and many of their corporations are still actively engaged in trade with Russia. Finally, enforcement struggled since the inception of 2022 sanctions.

Although the Kremlin's upbeat statistics should be approached with great caution, most economists concede that Russia's economy appears to have stabilized, supported by nearly 10 percent of GDP in war-related fiscal stimulus (Ribakova 2024b) and sanction coalition countries' reluctance to stop buying Russian oil and gas completely.

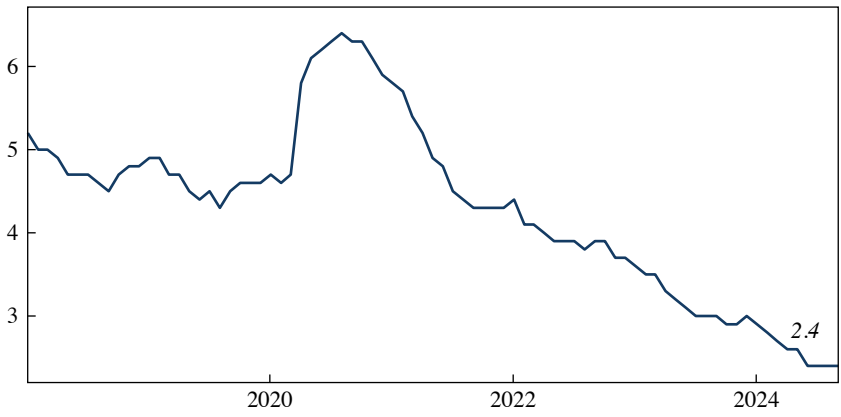
In 2023, the Russian government's statistics agency reported GDP growth of 3.6 percent following a moderate contraction in 2022 (figure 1). On the other hand, the inflation remains high (figure 2) despite numerous interest rate increases because the expanding war economy is stretching Russia's resources to their limits (figure 3). Nevertheless, despite the lower-than-hoped-for impact of sanctions, Russia still lost close to $128 billion in export proceeds due to war and sanctions (KSE Institute 2024), experienced much weaker growth compared with other commodity exporters (figure 4), and is

Figure 2. Russian Headline Inflation



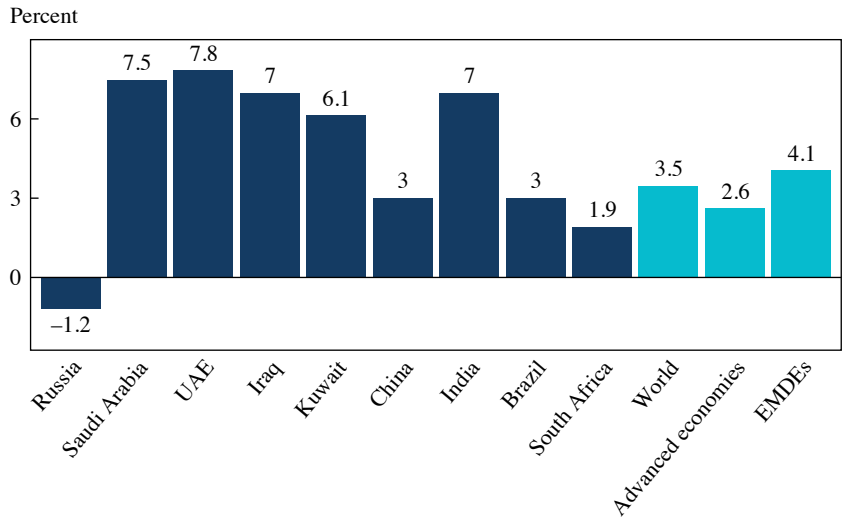
Source: Bank of Russia and KSE Institute.

Figure 3. Russian Unemployment Rate



Source: Rosstat and KSE Institute.

Figure 4. Real GDP Growth in 2022



Source: International Monetary Fund (2024).
Note: "EMDEs" refers to emerging markets and developing economies.

now facing a bleak medium-term outlook (Gorodnichenko, Korhonen, and Ribakova 2024).

With Russia's war on Ukraine in the third year, it is time to evaluate the effect of sanctions, what worked and what did not, and attempt to put forward an empirical and quantitative framework to analyze sanctions more broadly. We begin, in section I, with a brief literature review of both the broad literature on economic statecraft and the more recent literature that emerged in response to Russia's 2022 invasion of Ukraine and the ensuing sanctions on the Russian economy. We then present, in section II, a theoretical framework for evaluating various sanctions—trade, financial, and payment system—and their combined effects and costs to the sender. Section III lays out the timeline of sanctions imposed on Russian economy since 2014, and section IV provides an evaluation of their impact, with conclusions in section V.

I. Literature Review

The literature on economic statecraft, encompassing the use of economic tools to achieve foreign policy, national security, and military objectives, has recently seen a revival as countries expanded their use of economic

statecraft. The most comprehensive case-by-case analysis of sanction episodes to date, together with key policy takeaways, remains *Economic Sanctions Reconsidered, 3rd Edition* by Gary Clyde Hufbauer, Jeffrey J. Schott, Kimberly Ann Elliott, and Barbara Oegg (2009). A classic early text on economic warfare is Olson (1963). David A. Baldwin's seminal work, *Economic Statecraft* (2020), lays a comprehensive foundation, explaining the mechanisms and effectiveness of economic instruments in foreign policy. *War by Other Means: Geoeconomics and Statecraft* by Robert D. Blackwill and Jennifer M. Harris (2016) emphasizes the growing importance of geoeconomics as a tool of statecraft in global politics. Juan C. Zarate's *Treasury's War* (2013) complements this by providing a practical insider perspective on financial warfare post-9/11, underscoring the growing importance of financial instruments in modern statecraft. In addition, Chris Miller's *Chip War* (2022) and Nicholas Mulder's *The Economic Weapon* (2023) expand the discourse by exploring the strategic importance of the semiconductor industry and the historical evolution of sanctions, respectively; see also Harrison (2023).

Agathe Demarais's *Backfire* (2022) further examines the unintended consequences of US sanctions, highlighting how they can reshape global alliances and economic landscapes. Similarly, *Underground Empire* (Farrell and Newman 2023) focuses on the United States' weaponizing its control of the critical nodes for achieving foreign policy and security objectives, offering a comprehensive analysis of the complexities and implications of economic statecraft. Finally, Saleha Mohsin's *Paper Soldiers* (2024) provides a detailed examination of modern financial sanction.

Regarding Russia's specific case, several papers and books explore the impact of sanctions on Russia (post-2014 and post-2022). The most important among these include the chapter by Ahn and Ludema (2019), "Measuring Smartness: The Economic Impact of Targeted Sanctions Against Russia," which analyzes the economic effects of targeted or "smart sanctions" that aim to minimize harm to the general population and broader economy. Several papers by the Institute of International Finance take stock of Russia's response to 2014 sanctions and its preparedness for the ensuing sanctions (see, e.g., Lowery and others 2022a, 2022b; Ribakova and Hilgenstock 2022; Ribakova and others 2020). These papers also emphasize the critical importance of enforcement for the effectiveness of sanctions. *Punishing Putin* (Baker 2024) provides a description of the global response to Russia's full-scale invasion of Ukraine in 2022, with a focus on the sanctions imposed on Vladimir Putin, his inner circle, and Russia's economy.

It is essential to highlight the growing literature on the challenges of enforcing sanctions on Russia. Issues have been raised regarding the ineffectiveness of the oil price cap, including by the authorities themselves (Van Nostrand and Morris 2024), and export controls. The early success of the oil price cap, which reduced Russian oil rents without destabilizing global prices, has since been overshadowed by a lack of enforcement (Hilgenstock and others 2023). A major challenge to price cap enforcement has been Russia's buildup of a so-called shadow fleet, which is made up of oil tankers that are not owned, managed, or insured by entities that fall under the jurisdiction of the sanctions coalition (Hilgenstock, Hrybanovskii, and Kravtsev 2024). Designations of shadow fleet vessels, particularly by the US Treasury Department's Office of Foreign Assets Control (OFAC), have been an effective tool for reducing Russia's ability to disregard the price cap without removing aggregate capacity from the market (Hilgenstock, Kravtsev, and Pavytska 2024). The designation campaign remains limited in scope, however.

Export controls are another area of sanctions where enforcement has been insufficient. Russia still imports—largely through intermediaries like China—crucial components for military production. Room for improvement is most notable in corporate responsibility, where regulations like Know Your Customer could reduce illicit flows through third-party intermediaries, as well as in intracoalition coordination and harmonization and institution building (Bilousova and others 2024). Russia's inability to substitute for goods, particularly high-tech electronics, from entities in the sanctioning coalition highlights the further unrealized potential of export controls.

Sanctions on Russia in 2014 and 2022, as well as earlier rounds of sanctions on Iran, have spurred an active quantitative and theoretical literature on the topic. Felbermayr and others (2019) build a data set of information on sanctions between 1950 and 2016 to analyze the effect of sanctions on trade flows and real GDP change (see also Gutmann, Neuenkirch, and Neumeier 2023). Hausmann, Schetter, and Yildirim (2024) provide a criterion for sectoral bans on Russian exports at a detailed industry level. De Souza and others (2024) examine the most cost-efficient policies for imposing trade sanctions.

Crozet and Hinz (2020) quantify the economic impact of the sanctions imposed on Russia in 2014 using a gravity model, as well as the implied costs to sender countries. Ghironi, Kim, and Ozhan (2024) use a quantitative model to study macroeconomic and trade impacts of sanctions on financial markets, energy, and differentiated goods for both sender and receiver

countries. Kilian, Rapson, and Schipper (2024) examine the impact of the 2022 oil embargo and price cap on Russian oil prices using a calibrated model of the global oil market.

Nigmatulina (2023) examines the effects of smart sanctions imposed by the United States and EU on specific Russian firms and individuals following Russia's annexation of Crimea in 2014, and finds that these firms have increased their operations due to a reallocation of government resources toward them (see also Keerati 2024; Egorov and others 2025). Balyuk and Fedyk (2023) examine the decision and its financial consequences made by US firms to exit Russian operations following the 2022 invasion of Ukraine. Ndiaye (2024) studies how international boycotts, as a form of consumer activism, differ from government-imposed sanctions and tariffs.

II. Theoretical Approach to Modeling Sanctions

This part of the paper summarizes and builds on the earlier theoretical work to outline the main channels of how sanctions work.[1] We distinguish between trade, financial, and payment system sanctions. Standard frameworks for evaluating the gains (and losses) from trade and the optimal tariff literature allow us to analyze the trade effects of sanctions. Financial sanctions operate by limiting the ability of countries to borrow and finance trade deficits or save and invest in international financial markets, reducing the ability for risk sharing and intertemporal consumption smoothing. Payment system sanctions prevent the use of the international financial infrastructure for transmitting and clearing payments necessary to intermediate international trade. Countries that do not rely on international financing of trade flows and export commodities, which can be elastically relocated to different markets, are particularly immune to the effects of sanctions provided many third countries are not part of the sanctioning coalition. Nonetheless, payment system sanctions may result in significant barriers and disrupt trade flows with third countries.

We also outline the mechanisms of how unanticipated financial and trade sanctions, as well as sanctions on payment systems, can trigger financial and currency crises. In conventional macro trade analysis, payment system sanctions have no effect provided the country has access to elastic

1. This part of the paper builds on and extends earlier work, including Itskhoki and Mukhin (2023b).

spot currency markets. However, this is not the case in the new generation of models with limited elasticity of substitution in the currency market. Empirical evidence suggests that sanctions that restrict payment systems have a substantial bite in practice and hence highlights the need to work with such frameworks.

Finally, we discuss the important policy issue of the optimal sanctions mix. Throughout our discussion we keep in mind the three key objectives of sanctions are to limit: (1) the production capacity of the economy under sanctions, (2) the financing capacity of the economy and to put pressure on the government budget constraint, and (3) the production in certain key sectors of the economy, in particular military production and procurement.

These objectives may be achieved by means of a swift turbulence in the financial markets due to a bank run or a balance-of-payment crisis or, over a longer horizon, by tightening budget constraints to source inputs, as well as by curbing productive capacity in certain key sectors or the economy at large. Since our focus is on the short- to medium-run impact of sanctions, we leave out some additional important dimensions such as sanctions that aim to limit technology transfer and foster skilled emigration ("brain drain"); these are also very relevant in the context of Russia, but their impact has not yet materialized.

In addition, the sanctioning coalition might have in mind two additional dynamic considerations. First, symbolic sanctions without significant economic bite may be used to send a signal of future sanctions to come if the receiver country does not change its course. Such sanctions do not need to have a tangible economic impact but should outline the contours of likely future sanctions used as deterrent. While useful for providing incentives, this strategy also offers time to the sanctioned country to build an economic fortress for when tangible sanctions are imposed, which in retrospect offers an accurate description of the consequences of the post-2014 sanctions on Russia.

Second, the sanctioning coalition may want to use current sanctions as a punishment strategy that is observed by third countries and acts to prevent future deviations. For this to work, sanctions must be so severe as to make such deviations entirely untenable and hence not realized along the observed equilibrium path, which in turn allows the coalition to avoid bearing the costs of imposing such sanctions. This, of course, requires commitment and resolve on the part of the coalition; otherwise, such threats are not credible, in which case deviations do happen along the equilibrium path. This view changes the appropriate cost-benefit calculation, as benefits must include the additional—and perhaps much larger—indirect benefits due to

incentives they provide for avoiding future conflict.[2] An intriguing conjecture then is whether the credibility and the economic might of the Western coalition have deteriorated since the 1990s, resulting in both the decline of international institutions, such as United Nations and the World Trade Organization, and the reemergence of international conflicts (see Broner and others 2024).

II.A. Trade Sanctions

We start the theoretical analysis of sanctions with the baseline framework in international trade. It is natural to assume that a country in full economic autarky is entirely insensitive to international economic sanctions. The most immediate departure from autarky is balanced international trade with a closed capital account. In recent history, even the most rogue regimes did not come close to full economic autarky, and essentially every country in the world participates in some form of international trade, even when isolated from international financial markets. This is sufficient for international economic sanctions to have a clear and measurable impact according to standard trade theory.

We start the analysis from the following key principles of international trade (see, for example, the discussion in Helpman 2011):

(1) Trade results in overall welfare gains for both trade partners. This proposition emerges robustly across a variety of modeling frameworks, and the departures from this are generally of a pathological nature.

(2) Despite aggregate gains, trade generally results in a distributional conflict. That is, there are winners and losers from trade in each country, but the surplus of winners is usually sufficient to compensate the losers provided income transfers are feasible.

(3) Adjustment to trade shocks, whether positive (like trade liberalizations) or negative (like trade wars and sanctions), is associated with a period of costly transition in which a part of the gains from trade is dissipated or losses are amplified.

Trade sanctions operate via mechanisms (1) and (3), and *smart* trade sanctions are meant to also engage mechanism (2) (see Fajgelbaum and others 2020).

2. This is one of the reasons why many European economists, unlike European industrial lobbyists, supported swift and overwhelming sanctions on Russian energy exports immediately after the invasion started in 2023; see Portes and others (2022) and Guriev and Itskhoki (2022).

WELFARE COSTS OF SANCTIONS UNDER BALANCED TRADE Arkolakis, Costinot, and Rodríguez-Clare (2012) propose a simple way to quantify welfare gains from trade as:

$$\text{Gain from trade for country } i = 1 - \lambda_i^{1/\varepsilon}, \tag{1}$$

where λ_i is the expenditure share on domestic goods, hence $1 - \lambda_i$ is the expenditure share on imports, and ε is the trade elasticity. Formula (1) applies across a number of widely used models of international trade that give rise to a gravity structure of international trade flows, for which there is substantial empirical evidence.[3]

Intuitively, formula (1) emphasizes two main forces—how much the country trades, $1 - \lambda_i$, and how easy it is to substitute the imported goods for domestically produced goods, ε. The effect of a trade shock can be judged by how much it affects the expenditure share on imports:

$$\text{Change in welfare of country } i = -\frac{1}{\varepsilon} d \log \lambda_i. \tag{2}$$

Note how the assumption of trade balance results in the import share being a sufficient statistic for welfare without conditioning on the effect on exports. Also note that formula (2) characterizes simultaneously the effect on welfare, real consumption, and real GDP of the country, which may or may not be the main objective of sanctions. Given balanced trade, changes in real consumption also correspond to changes in the real purchasing power of income. Hence, if monetary policy stabilizes the local nominal wages, then it also corresponds to the inverse of consumer price inflation.[4]

3. Gravity equation in international trade predicts that larger countries are connected by larger trade flows and trade flows dissipate with distance between countries. Formally, Arkolakis, Costinot, and Rodríguez-Clare (2012) show that ε corresponds to the trade cost elasticity (which is conventionally linked to the geographical distance and other trade barriers) in the gravity equation after controlling for other economic determinants of trade (such as the size of countries and their trade network). See Head and Mayer (2014) and Costinot and Rodríguez-Clare (2014).

4. While generally this would not be the optimal monetary policy response, it can approximate the reality where most of the inflation shock comes from the import price inflation due to sanctions, when wages and nontradable prices change little on impact. In fact, the Russian inflation experience in 2022 is largely due to this mechanism (see figure 2), while Russian inflation that started in mid-2023 reflects other forces, in particular the overheated economy due to the behemoth government war expenditure that climbed toward double digits as a percentage of GDP.

Formulas (1) and (2) can be extended to multisector economies and economies with complex input-output linkages (see Costinot and Rodríguez-Clare 2014; Baqaee and Farhi 2024), emphasizing the ability to substitute various foreign goods and inputs with the domestic ones. The easier it is to substitute with domestic production, the smaller are the gains from trade, or equivalently the smaller are the losses from trade sanctions. Conversely, the presence of certain bottleneck goods or industries, which are nearly impossible to substitute away from and which are centrally used in the production of other goods, may result in extreme losses from fragmentation (Ossa 2015). Furthermore, a similar characterization of losses from trade applies for sectoral-level outcomes, such as real sectoral output, with the caveat that trade elasticities are likely different at disaggregated levels.

Another important insight is that the change in the aggregate (or sectoral) trade share is largely a sufficient statistic to evaluate the impact of a given trade policy on aggregate welfare (sectoral output). This makes it easy to immediately evaluate the impact of policies from trade data (provided estimates of trade elasticities), which are generally easier to procure than macro data.[5] Furthermore, substitution across external trade partners that leaves trade shares unchanged does not change welfare or allocative efficiency. Therefore, it is the aggregate trade share, not bilateral trade shares with specific trade partners, that is generally (but not always) most informative. The ability to substitute goods and input sourcing away from the sanctioning coalition to countries that are not members of the sanctioning coalition grossly limits the effectiveness of sanctions.

In the case of Russia, the import share did collapse on impact by nearly 50 percent, with a corresponding spike in import and consumer price inflation (see figures 2 and 9). Perhaps surprisingly, trade has plummeted initially with both sanction coalition countries and with third countries that never joined the coalition formally or informally. This was, perhaps, the consequence of uncertainty about the likelihood of secondary sanctions that was an effective deterrence early on. However, trade has rebounded quickly over the ensuing months and was back to the prewar level within less than a year. This happened largely due to the reallocation of trade flows (including rerouting) from the sanctioning coalition countries to third countries, once trial and error showed the lack of both enforcement (leakage) and of an effective secondary sanctions mechanism. According to

5. Noteworthy, Russia immediately classified many sources of internal macroeconomic and trade data. Nonetheless, it was still possible to assess international trade with Russia using the data of its trade partners.

this metric, sanctions had a major impact early on, which however waned very quickly.[6]

SIZE OF COUNTRIES The baseline result of formula (1) has a clear implication about the role of the size of countries both imposing and receiving sanctions. Historically, a reasonable assumption is that a country under sanctions is small, and hence there are no costs to sender. In general, however, formula (1) clarifies that the costs go both ways and are inversely proportional to country size.[7] Thus, if the sanctioning coalition is n times larger than the sanctioned country, we should expect that the costs to the coalition are n times smaller. The larger the coalition, the smaller the relative cost. Nonetheless, this also emphasizes that the costs to sender are still proportional to the impact of sanctions on the receiving country, suggesting an inherent trade-off ("no pain, no gain").

Furthermore, if there are third countries that are not part of the sanctioning coalition and that freely trade with the country under sanctions, this mitigates the impact, provided these countries can effectively substitute, or even reroute, some of the goods produced by the sanctioning coalition.[8] Thus, cooperation with third countries, or their coercion by means of secondary sanctions, is crucial not to derail the sanctions policy.[9]

Last, this analysis can be carried out at the level of individual sectors and products, and then the size of the country in individual industries must be considered as well. Even if a country is small overall but happens to be a large supplier of a certain good that is difficult to substitute away, the cost of sanctions to sender countries can be disproportionately large.

The practical implications in the case of Russia are as follows. While Russia is not a very large country, with a prewar GDP about one-tenth that

6. We have limited information about the decline in quality and the increase in costs of the goods that are sourced from alternative suppliers and using indirect trade channels. There are reasons to believe that both effects are present to some extent (see, e.g., Borin and others 2023), in which case sanctions do "throw sand in the gears" of the Russian economy despite import values having recovered to the preinvasion levels.

7. Under trade balance, a country with a larger aggregate expenditure has a proportionally smaller trade share, as a matter of simple accounting.

8. Theoretically, this can be captured by a lower elasticity of substitution between the domestic production and imports and a higher elasticity of substitution between imports from the sanctioning coalition and the rest of the world. Indeed, in the case of rerouting, this latter elasticity is close to infinite, albeit such substitution is subject to an extra transport cost or an additional markup and hence not entirely without loss. More generally, this assumption on elasticities is realistic even if we do not take into account rerouting but consider actual substitution of supply chains to third countries.

9. See the related literature on geoeconomics that explores alternative forms of economic coercion besides the optimal tariff (e.g., Clayton, Maggiori, and Schreger 2023).

of EU (its main trade partner), the trade shares with Europe were nonetheless nontrivial, especially in energy exports, where Russia was the key and difficult-to-substitute supplier. For these reasons, Russia cannot be taken as a small country in the analysis of sanctions. Furthermore, the overall sanctioning coalition did not include large countries such as China, India, South Africa, Brazil, and Turkey. Unlike in the Cold War era, where the West controlled over 75 percent of GDP of the world, now the share of the Western economies is less than 60 percent, making unilateral Western sanctions less effective (International Monetary Fund 2024). Any sanctions policy that makes a meaningful dent in the Russian economy cannot be seamless for the European sender countries, and furthermore global cooperation is indispensable.

EQUIVALENCE BETWEEN IMPORT AND EXPORT SANCTIONS A seminal result in international economics is the Lerner (1936) symmetry—namely, the equivalence between an import tariff and an export tax. The implication of this result is that import and export sanctions of a similar magnitude result in the same equilibrium allocation and welfare consequences.[10] Note that this does *not* imply that import and export sanctions are substitutes—in contrast, their effects cumulate until trade is reduced to zero. Only if import sanctions are so severe as to exclude the possibility of buying any foreign goods, now and in the future, then such import sanctions make export sanctions redundant.[11]

Lerner symmetry logic relies on the long-run trade balance and is ensured by the general-equilibrium adjustment in relative prices that support it. For example, an import tariff reduces imports on impact and shifts demand toward domestic goods. However, this must be accommodated with an increase in the local costs of producing goods (e.g., wages), which in turn reduces exports and rebalances international trade. Conversely, an export tax reduces foreign demand for domestic goods and consequently must lower the costs of production (wages) to achieve the same balanced trade outcome, and hence equivalence follows. Often such adjustment happens by means of an exchange rate appreciation or depreciation, which supports the same allocation under import and export sanctions, respectively. Thus, an

10. Formally, a uniform import tariff on all traded goods is equivalent to a uniform export tax of the same magnitude. In macroeconomic context, this must apply not only to all traded goods and services but also to all time periods—present, future, and past (i.e., an export tax must be combined with a tax on accumulated net foreign assets); see Farhi, Gopinath and Itskhoki (2014) and Barbiero and others (2019).

11. This obvious point requires emphasis given the number of misleading arguments made in the policy debate about the sufficiency of import sanctions early on in 2022, and given that import sanctions were politically cheaper to impose than export sanctions. By import sanctions we mean sanctions on Russian imports (or export controls by the sanctioning coalition) and by export sanctions we mean sanctions (e.g., embargos) on Russian exports.

equilibrium exchange rate appreciation is consistent with the situation where import sanctions have a greater impact than export restrictions (Itskhoki and Mukhin 2022). Despite this differential exchange rate movement, the terms of trade of the country under sanctions deteriorate by the same amount and are the conduit of welfare losses from either policy.

Lerner symmetry is a general equivalence result that extends to individual budget constraints. For example, if the purpose of sanctions is to tighten the government budget constraint, it still can be achieved with sanctioning export revenues or imports of goods, irrespective of who carries out trade (i.e., a government company exporting commodities or a household buying imported goods). Of course, this concerns only the equivalence of equilibrium economic allocations and not the political feasibility of certain policies that may differ substantially across different policy options. In the context of European policy, sanctioning Russian imports was politically more feasible than limiting or taxing Russian energy exports, and the symmetry logic above was used in part to justify the lacking export restrictions. This logic fails when sanctions policy is not (perceived as) permanent, as we discuss below in section II.B.

ADJUSTMENT TO TRADE SHOCKS The discussion above emphasizes the role of elasticity of substitution in evaluating the effects of sanctions. Conventional wisdom and available estimates suggest that this elasticity is much lower in the short run than in the long run (see Ruhl 2008; Boehm, Levchenko, and Pandalai-Nayar 2023). This is the basis for arguing that sanctions have the largest bite in the short run, especially when they are unanticipated. Preannounced or anticipated sanctions have a smaller bite, offering an opportunity for an early adjustment.[12]

Furthermore, in cases where preannounced sanctions on future commodity exports have an immediate effect to raise current commodity prices, the policy can backfire altogether. This was, arguably, in part true in 2022 when the anticipation of sanctions on the Russian energy sector was a contributing factor to the record-high levels of world oil prices, even though the Russian oil supply to the world market never ceased.

The experience in 2022 also suggests that significant adjustment can happen swiftly if the sanctions shock is large and dramatically moves

12. The direct impact of sanctions is further complicated by the ability of countries to trade intertemporally, and in particular by creating stockpiles of most vulnerable inputs; see Kim (2024) for the adjustment by South Korean industries to the anticipated Japanese export controls during the 2019 trade dispute. Even sharp but temporary disruptions to trade flows may have little impact if they can be effectively smoothed out over time. This is particularly relevant for certain industries like military production, which are the main target of sanctions.

relative prices. This was true for the adjustment of the Russian economy, which by the end of the year had largely relocated the bulk of its energy supply to China and entirely new customers in India and Turkey (offering them large price discounts). Russia also relocated its international import sourcing to China, Turkey, and former Soviet countries. But it was equally true for the European economy and its substitution away from Russian energy sources, which was largely completed by the end of 2022, with Europe bracing for a major recession in 2022 that did not materialize (see Bachmann and others 2024 and the heated debate that surrounded its circulation in 2022 summarized in Moll, Schularick and Zachmann 2023).

OPTIMAL TRADE SANCTIONS The description above is positive, characterizing the impact of trade restrictions and sanctions on the receiver and sender countries. Equally important is the normative question of optimal sanctions, which balance the desired goals of sanctions with the associated economic costs to sender countries. Since the effect of trade sanctions is transmitted via the movement in the terms of trade, the normative question of optimal sanctions is closely related to that of the optimal tariff. The optimal tariff is effectively an aggregate monopoly markup on trade flows that is larger when the import demand is less elastic.

Optimal sanctions augment the optimal tariff, imposing proportionately larger trade taxes. Becko (2024) shows that trade sanctions that aim to curb the target country's aggregate production or welfare augment proportionally the optimal tariff that would be imposed unilaterally with the goal of extracting maximum economic surplus. This means that optimal sanctions in this case overshoot and deliver smaller economic surplus to the sender as they additionally serve to curb output of the target country. Alekseev and Lin (2024) study optimal trade sanctions with the goal of curbing foreign output in a subset of sectors to maximize the chance of winning in a geopolitical competition. They show that optimal sanctions in this case augment the optimal tariff by introducing additional Pigouvian taxation of trade flows that are central (in a formal input-output network sense) to the industries in question.[13]

II.B. Financial and Payment System Sanctions

Trade sanctions reduce the amount of trade between countries, keeping trade balanced. Financial and payment system sanctions focus on limiting the ability to finance trade intertemporally or even within a given period.

13. Becko and O'Connor (2024) model ex ante strategic response to the prospect of future sanctions policies. Bianchi and Sosa-Padilla (2023) study optimal financial sanctions in a model with safe asset provision.

In the limit of full financial sanctions, the country can only carry out barter transactions, exchanging exports for imports directly, granting the sanctioning coalition the ability to control imports. This is akin to the limitations imposed on the Soviet Union imports during the Cold War era. Since the 1980s, trade linkages have grown increasingly complex, making international financing and payments increasingly more important in international trade.

FINANCIAL SANCTIONS The aim of financial sanctions is to curb the ability of *intertemporal* trade—whether borrowing internationally, using accumulated foreign assets to pay for current imports, or using current export proceeds to buy future imports. The discussion above relies on the idea that all exported revenues can be used to buy imports now or in the future while financial sanctions disrupt this logic. Sanctioning accumulated financial assets is politically easiest, as it avoids the mutual economic costs of trade sanctions discussed above, but this may carry reputational consequences in the asset markets.

Financial sanctions are most effective when a sanctioned country relies on international financial markets to procure imported inputs. In this case, sanctions can trigger or amplify a sudden stop in financial flows, which in turn creates a disruption in procuring imports and possibly causes a full-scale bank run. This is the case in which international sanctions can have the largest impact by disrupting the functioning of the entire financial system of the target country beyond the direct international trade effects. However, if the country is neither an active net borrower in international markets nor has a large accumulation of gross foreign asset positions, financial sanctions may have only limited effects that can be mitigated with financial repression of capital outflows (see Itskhoki and Mukhin 2022).

In the case of Russia, which had a sizable net foreign asset position and little gross foreign debt, financial sanctions were mostly targeting foreign assets. This turned out to be insufficient to trigger a persistent financial crisis, in part because of the large concurrent trade surplus that provided strong currency inflow into the economy and appreciated the ruble. This current account surplus was sufficient to stabilize the financial system even without continued use of financial repression and austerity in expenditures. While the welfare costs from frozen assets and disrupted imports were real, there was no financial strain associated with a typical balance of payment crisis. Indeed, this was an unusual situation of temporary abundance of foreign exchange liquidity driven by restricted imports under soaring export revenues from high commodity prices (Itskhoki 2023).

VIOLATION OF LERNER SYMMETRY Lerner symmetry between import and export sanctions does not apply when sanctions policy is not uniform over

time, that is, when sanctions are not deemed permanent or when there are significant gross foreign asset positions not subject to sanctions (see Itskhoki and Mukhin 2023a). Import sanctions have two distinct effects relative to export restrictions. First, if they are not deemed permanent, they create incentives to delay import purchases, thus limiting the need to borrow to pay for imports in the current period. In other words, they relax the need for austerity as they delay desired expenses.

Second, import sanctions, whether temporary or permanent, result in currency appreciation (Lorenzoni and Werning 2023). As discussed above, exchange rate appreciation is the mechanism that supports the adjustment toward trade balance when import flows are restricted, resulting in a surplus of foreign exchange from exports. The appreciation is not allocative per se when sanctions are uniform over time and when there is no foreign currency debt. However, this is not the case when the sanctioned country either has net foreign debt or relies on foreign currency financing at home. Exchange rate depreciation increases debt overhang, while appreciation does the opposite, relaxing financial constraints on the economy. As a result, import sanctions can backfire by offsetting some of the effects of financial sanctions and helping to avoid a possible financial crisis or a bank run.

FINANCIAL CRISIS Financial crisis may be the immediate goal of steep and swift financial sanctions, as it is significantly less costly to the sender than long-term trade sanctions. However, certain conditions must be satisfied for a financial crisis to materialize as a result of sanctions. The crisis is more likely in a country with: (1) larger current account and government budget deficits, (2) larger external debt, and (3) greater incidence of dollarization in the domestic economy, especially in domestic borrowing and lending.

Under these circumstances, a combination of financial sanctions with export restriction has the greatest capacity to inflict a bank run and a financial crisis in the economy. In particular, this is the case because such sanctions cut off the currency supply to the economy and hence trigger a currency devaluation, which puts additional stress on the financial system that relies on foreign currency debt.

In the case of Russia, arguably no condition for a financial crisis was satisfied. The Russian economy was not dollarized, had little external debt, ran current account and budget surpluses, and had significant accumulated foreign exchange reserve—the so-called economic fortress of Russia. This was, in part, due to the earlier financial sanctions imposed in 2014–2015 that cut off Russian government and larger firms from the international financial market. The consequence was that the Bank of Russia (or the Central Bank of the Russian Federation, CBR) could fend off a bank run

and prevent a currency crisis by using a range of financial repression measures that were later relaxed. It is, nonetheless, likely true that not imposing a swift embargo on the Russian energy exports was a missed opportunity, which could have significantly limited the ability of the government to curb the bank run and currency crisis that were emerging in the weeks following the invasion.

PAYMENT SYSTEM SANCTIONS An understudied area is the role of payment system sanctions.[14] In standard economic models, payment systems are taken for granted and usually do not affect either trade flows or asset flows. However, in practice, payment systems prove to be very important as their disruption makes trade transaction impossible, even when trade is balanced and does not require intertemporal financing. Furthermore, enforcement of such sanctions via the banking system might be significantly less costly than enforcement of trade sanctions in the corporate sector by shifting the due diligence onto the financial institutions, as we discuss in the next two sections.

A related topic concerns frictions in the use of third-country currencies in settling international transactions when transactions with Western currencies are sanctioned. This calls for the development of novel models that focus on the transaction costs associated with clearance of international payments. Tight payment system sanctions bring the outcome closer to a barter equilibrium where trade must be balanced across all trading partners, limiting the scope for gains from international trade.

Current international payment systems are provided and controlled almost exclusively by the United States and its allies, giving the Western coalition significant leverage in the use of payment system sanctions. An open question is whether this is a durable equilibrium, or whether we are on the cusp of a shift to a network of more fragmented and less centralized payment systems. If so, to what extent is such a shift an organic development or a direct consequence of weaponization of the Western financial infrastructure for geopolitical goals?

OPTIMAL SANCTIONS MIX The discussion above emphasizes both the equivalence and complementarity in the use of certain international sanctions. Different combinations of financial and trade sanctions can be used to curb international trade flows, as suggested by Lerner symmetry. Nonetheless, from the perspective of financial impact, we can identify clear complementarities. In particular, import sanctions are a poor complement for financial

14. For recent work on payment system sanctions, see Livdan, Schürhoff, and Sokolov (2024) and Clayton, Maggiori, and Schreger (2024).

sanctions, as they partially offset the pressure that financial sanctions put on the currency market and alleviate the need for financing of import expenditure. In contrast, export sanctions and financial sanctions complement each other as together they double down on cutting off the supply of currency to the economy and jointly can trigger twin currency and balance of payment crises.

To summarize, an optimal sanctions mix likely involves a combination of swift and comprehensive financial and payment system sanctions complemented with a broad export embargo and granular, well-targeted import restrictions on dual-use goods. Of course, implementing such a coordinated policy requires commitment and political resolve to deal with the economic costs to sender countries. Furthermore, political economy constraints may delay the implementation of such policies or render them infeasible altogether.

In the context of the 2022 Russian sanctions, political constraints played the central role. This resulted in a combination of an immediate asset freeze and sanctions on the financial system including the Russian central bank, followed by broad import sanctions (export controls), but without any significant embargo or tax on Russian commodity exports. While this policy had a significant short-run bite in terms of reducing Russian imports, it failed to impose sufficient financial stress on the economy, and thus afforded Russian economy the time to adjust to the new equilibrium under sanctions.

III. Russia Sanctions—Objectives, Primary Instruments, and the Timeline

This section of our paper documents the primary instruments of economic statecraft utilized, their objectives, and their timing. Russia has been under sanctions since well before its full-scale invasion of Ukraine in 2022. A coalition of countries, including the United States and the EU, has imposed sanctions on Russia for a range of issues ranging from election interference, cybercrime, use of chemical weapons, and the invasion of Ukraine in 2014 and 2022.

The tools of economic statecraft (for simplicity, we refer to these measures of economic statecraft as "sanctions") include any form of economic leverage to achieve foreign policy, national security, or defense objectives. The most typical measures include limitations on trade and leveraging other critical dependencies such as financial linkages—the use of the US dollar and US-based financial systems. Yet not only are there almost no studies analyzing the cross-disciplinary effects, but there is only a limited

number of studies analyzing the economic and financial impact on target economies (countries being sanctioned) as well as on the sanctioning country (Prusa 2008).

Studying sanctions is particularly challenging due to their numerous, evolving, overlapping, and sometimes contradictory objectives. Even in 2022, these objectives were vague and lacked measurable targets. Commonly stated goals include regime change, deterrence, and imposing a cost, among others (Free Russia Foundation 2023). In the case of Russia, the objectives eventually settled on reducing Russia's revenues, limiting its ability to continue the war in Ukraine, imposing pain on the Russian economy, and punishing human rights abuses.[15] In summary, we believe that in 2014–2015, the likely aim was to alter the regime's cost-benefit analysis of its invasion. By 2022, recognizing that economic pressure alone would not be enough to deter Russia from continuing its war, the United States shifted its focus to degrading Russia's ability to win the war.

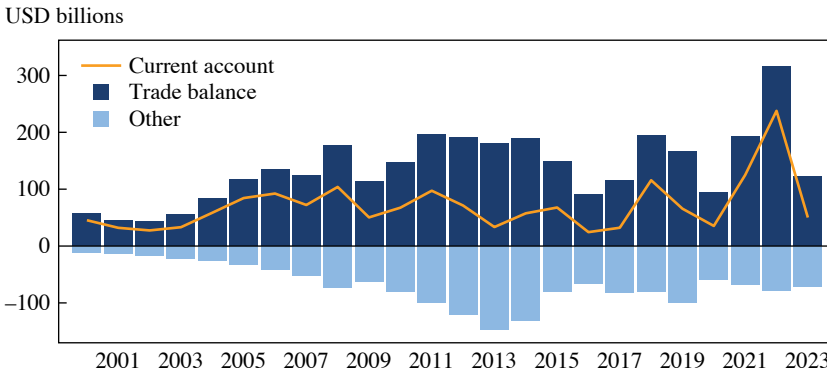
Russia's 2022 case stands out due to its size and degree of integration into global markets (Ribakova 2024a) compared to the earlier cases of Iran, North Korea, and Venezuela. Russia has been under sanctions since 2014; however, the scale and ambition of sanctions at the time were more limited.

While Russia is frequently cited as the most sanctioned country globally based on the number of sanctions (Scarpino and Trainer 2024), economic indicators such as trade impact suggest otherwise for 2022 (see figure 5). Despite the high number of sanctions, Russia's current account surplus increased in that year. If anything, Russia experienced a positive terms-of-trade shock of an extraordinary magnitude. While the scale of the 2014 sanctions was more limited, one consequence was that by January 2022, Russia was already less globally integrated than it had been in January 2014. Along with the preparatory work by Russian authorities to brace for future sanctions since 2014, this helped insulate the country from the impact of the 2022 sanctions. The actual economic impact, including how much the trade balance was compressed during 2022–2024, reveals that the net effect of these sanctions might not be as significant as the number and variety of imposed sanctions would suggest. Thus, while the count of sanctions is high, the tangible impact on Russia's economy is less clear.

We find that dynamics over time matter, an area that has so far attracted little attention in the literature. It might be best to approach sanction effects

15. The US announcements of the sanctions on Russia can be found at US Department of State, "Russia," accessed September 9, 2024, https://www.state.gov/countries-areas/russia/.

Figure 5. Current Account of Russia



Source: Bank of Russia.

as nonlinear. Initially, if the shock is significant enough, sanctions can impose immediate costs on the target country. However, the target country inevitably finds workarounds, and the immediate effect of sanctions wanes. While the US Treasury has a doctrine of "sanctions maintenance"—it aims to ratchet up sanctions continuously (and close loopholes) so that the sanctions will have the same economic impact over time—this does not appear to work as well in practice (Stubbs and Zengerle 2018). Over time, sanctions continue to weigh on the economic prospects of the sanctioned country, but the time horizon may be beyond the scope of politicians, especially if the country entered the crisis with strong buffers. In the worst-case scenario, by applying cautious sanctions spread over time, this produces a counterproductive effect of "vaccinating" a country against the impact of sanctions.

III.A. Russia 2022—The Timeline of Events

Modern Russia has been under significant macroeconomic sanctions since 2014.[16] Sanctions on Russia can be divided into three phases. The first phase occurred after Russia annexed Crimea and the onset of the Russia-sponsored war in Eastern Ukraine. In March 2014, the United States imposed sectoral sanctions on entities in the Russian economy's financial, energy, and defense sectors by adding them to the Treasury Department's Sectoral Sanctions Identifications (SSI) List under executive orders

16. For a historical overview of sanctions imposed on the Soviet Union and Russia before 2014, see Free Russia Foundation (2023).

(OFAC 2025).[17] These sectoral sanctions, among other measures, prohibit US persons from participating in the issuance of new debt securities with maturities above specified thresholds. Most of these sanctions focused on the financial sector (Welt and others 2022). In addition, the United States and the EU imposed export controls with a narrower aim of restricting Russia's access to sensitive technologies and goods, particularly in the energy, defense, and high-tech sectors. The objective of the hard-hitting financial sanctions was to inflict sufficient pain on the Russian economy to bring Russian authorities back to the negotiation table and induce it to pull back from Ukraine. At the time, the US administration was not ready to provide direct military aid to Ukraine and believed that Russia's desire to maintain links to global financial markets would induce a behavior change.

In retrospect, better lessons should have been drawn from the 2014 experience of sanctioning Russia. The key point is that when sanctions aimed to induce behavioral change, their impact was less about the immediate pain they inflicted—which was still significant—and more about the signal they sent regarding potential future measures. Although the United States and its allies did not seize the Russian central bank's assets or expel Russian banks from the Society for Worldwide Interbank Financial Telecommunication (SWIFT) system in 2014, they made it clear that incremental Russian military advances would be met with a steady escalation of sanctions. By 2022, the objective shifted from influencing behavior to degrading Russia's war-fighting capability. In retrospect, it is evident that there was no reason not to have imposed all possible decisive measures against Russia from the outset once Russia launched the full-scale invasion in February 2022.[18]

The second phase of sanctions on Russia, spanning from 2015 to 2021, involved largely unilateral and somewhat haphazard actions by the United States. Since 2015–2016 the US sanctions were imposed on Russia for election interference and malign cyber activities. In August 2017, Congress codified existing executive sanctions and introduced new ones through the Countering America's Adversaries Through Sanctions Act (CAATSA), targeting cybersecurity, crude oil projects, financial institutions, and defense sectors and penalizing those evading these measures. In April 2018, sanctions on Russian oligarchs and companies like Rusal disrupted global

17. Including executive orders 13660, 13661, 13662, and 13685.

18. The 2014 sanctions bought eight years of time to prepare for the 2022 war. Russia used this time to build an economic fortress to withstand the economic pressures of the war and ensuing sanctions. Whether the United States and the EU put this time to good use to prepare for the escalation of the conflict is more doubtful. On the contrary, the European reliance on Russian energy exports, if anything, has only increased during this period.

aluminum markets until lifted after ownership changes. Following the poisoning of Sergei Skripal, the United States imposed sanctions under the Chemical and Biological Weapons Control and Warfare Elimination Act, including a significant 2019 ban on US financial institutions from participating in non-ruble-denominated Russian sovereign debt issuance. The National Defense Authorization Acts for FY2020 and FY2021 targeted companies involved in Nord Stream 2 and TurkStream pipelines, expanding sanctions to cover pipe-laying facilitation. In April 2021, the Biden administration, under executive order 14024, further restricted US financial institutions from engaging in the primary market for Russian government bonds, extending the scope to the OFZ market (see Free Russia Foundation 2023; Lowery and others 2022a, 2022b; Ribakova and Hilgenstock 2022; Ribakova and others 2020).

The third phase of sanctions began with Russia's full-scale invasion of Ukraine on February 24, 2022, prompting the international community to impose extensive sanctions. Most of the original set of sanctions were financial sector sanctions, focused on denying Russia access to global financial markets and architecture. In the days leading up to the invasion, the United States targeted sovereign debt markets, financial institutions, and Kremlin elites. On February 23, the United States sanctioned the Nord Stream 2 pipeline operator after Germany suspended its certification. By February 24, the United States, EU, and Group of Seven (G7) imposed broader sanctions restricting Russia's access to major currencies, freezing assets of additional banks, and imposing export controls. On February 26, further measures included removing several Russian banks from SWIFT, freezing the Bank of Russia's assets, and imposing sanctions on the Bank of Russia. Additional sanctions on Russian banks, corporations, and institutions were imposed as the years progressed; however, many Russian banks still maintain access to global services today (Hilgenstock, Ribakova, and Wolff 2023) and some of the incremental financial sanctions seem more likely to insulate the Russian financial industry against shocks rather than create them. On one hand, it is important to maintain constant pressure, as Russia and its allies often find workarounds to sanctions. On the other hand, failing to sanction all malign actors simultaneously allows Russia to adapt more easily. For instance, in the case of the financial industry, if the primary concern is energy trade, one bank—such as Gazprombank—could be left to handle such transactions, while all other banks are sanctioned and excluded from the SWIFT system.

The expansion of export controls is another important part of the third phase of sanctions following Russia's 2022 full-scale invasion of Ukraine. Starting in 2014, US export controls concentrated on "choke point" technologies—

items that Russia could not theoretically obtain from countries not participating in the sanctions. Preventing transshipment through third countries posed a significant enforcement challenge. Technology exports to Russia now largely require a license. Even before Russia's 2022 invasion of Ukraine, export controls limited supplies to Russia's military-industrial complex, barring US manufacturers from exporting items under the Export Administration Regulations (EAR) to Russian defense firms and prohibited exporting munitions. In 2018, the Bureau of Industry and Security (BIS) added Russian entities linked to the oil and gas industry to its Entity List, necessitating US companies to obtain export licenses.

In response to Russia's full-scale invasion of Ukraine in 2022, the United States imposed broader countrywide restrictions (Kilcrease 2022), denying licenses for lower-level technologies with potential military applications, including those critical to Russia's energy sector, and expanding export restrictions targeting semiconductors, computers, telecommunications and information security equipment, lasers, and sensors. These controls aimed to cripple Russia's defense, aerospace, and maritime sectors by denying access to critical technologies, thus weakening its industrial base and strategic capabilities.

The foreign direct product rules further restricted Russia's ability to source these materials from third-party nations. These export controls extend extraterritorially, affecting items made abroad using US tools or software, particularly in chip manufacturing, and applying stringent rules to designated Russian military entities.

BIS also imposed stringent controls on aviation-related exports to Russia and Belarus, including licensing requirements for aircraft and parts made in the United States or containing significant US components. On March 4, 2022, BIS tightened export controls on Russia's strategic industries, particularly oil refining, and sanctioned ninety-one entities supporting Russian military activities.[19]

Subsequent executive orders and regulatory updates throughout 2022 expanded these controls to include luxury goods, dollar-denominated banknotes, services, and a wide range of commercial and industrial equipment. BIS also added numerous Russian entities to the Entity List, culminating in a broad ban on items useful in chemical and biological weapon production and quantum computing technology by September 2022.

Most of the restrictions on Russia's exports, particularly energy exports, did not come into force until 2023 (Hilgenstock and others 2023). While

19. See BIS's 2022 press releases on export controls implemented in response to Russia's invasion of Ukraine at https://www.bis.doc.gov/index.php/policy-guidance/country-guidance/russia-belarus?layout=edit&id=2188.

some countries, particularly the United States and the United Kingdom, imposed an embargo on Russian oil shortly after February 2022, the EU was the most significant buyer of Russia's energy. In June 2022, the EU implemented its sixth round of sanctions, introducing a complete ban on imports of Russian seaborne crude oil, effective from December 5, 2022, and a ban on all oil products starting February 5, 2023. While these sanctions were the most significant energy-related measures introduced so far, there was concern about a provision that would ban EU operators from transporting, insuring, or financing the transport of Russian crude oil. Given the pivotal role of Western shipping companies and maritime insurers, there was fear among the US government and other coalition countries that this could lead to a drastic reduction in Russian crude oil supply, exacerbating the impact of the war on global energy markets.[20]

Meanwhile, Ukraine's allies aimed to limit Russian revenue from oil and gas exports. To address these concerns, the G7 and the EU established a price cap mechanism for Russian crude oil and oil products, which allowed Western companies to continue their involvement in Russian exports as long as prices remained below a specified level. The cap was set at $60 per barrel for crude oil, effective from the embargo's start in December 2022. For oil products, the cap was introduced in February 2023, with a $45 per barrel limit for products trading at a discount to crude oil, such as fuel oil, and a $100 per barrel limit for products trading at a premium, such as diesel (Rosenberg and Van Nostrand 2023).

Sanctions targeting Russia's gas exports have included several strategic measures to diminish its energy revenues and reduce dependency on Russian gas. The EU has imposed bans on importing Russian natural gas, with a planned phaseout of supplies. Additionally, sanctions have affected key infrastructure projects, such as the Nord Stream pipelines, and restricted investments and technology transfers critical to gas development. Financial restrictions on entities within the gas sector further limited their access to international financial systems and capital. Collectively, these sanctions were designed to undermine Russia's energy sector and economic stability. A recently company-commissioned report concluded that sanctions badly hurt Gazprom (Seddon, Cook, and Stognei 2024). In addition to oil and gas, Russia faces sanctions on coal exports and certain metals. These restrictions are intended to reduce Russia's revenue from these products. The coalition of countries opposing Russia's war on Ukraine has been cautious

20. To anticipate our discussion of the results of the policy, one area where sanctions were remarkably successful is at ensuring a constant flow of Russian oil to the world market.

to avoid sanctioning Russia's exports of food and fertilizers in order to prevent adverse humanitarian consequences.

It is important to note the reason why it took so long for the coalition of countries to act. Until recent cases of Russia and China, the concept of cost to sender (Hufbauer and others 2009)—the cost to the country imposing sanctions—had been largely forgotten as it has been small. In the case of Russia, the cost-to-sender factor has been an important consideration for policymakers. During 2014–2015, the EU at times focused more on debating how to distribute the costs equally than on the impact on Russia. The EU also drew a red line on sanctioning the energy sector at the time. More recently, it has been the United States that has resisted any measures likely to drive up international energy prices. Disconnecting from Russian energy for Europe or a spike in global oil markets for the United States could have had a significant impact on the sanctioning economies (Moll, Schularick, and Zachmann 2023).

The final stage of 2022 sanctions was the so-called self-sanctioning.[21] Many companies voluntarily announced that they would either divest fully or scale back their operations in Russia. The departure of foreign businesses from the Russian market highlights a complex interplay of economic, ethical, and bureaucratic factors. In most cases, company actions are not merely responses to immediate pressures but are part of carefully considered strategies that affect the overall dynamics of foreign business presence in Russia and their global exposure. Economic factors include the potential financial losses and the logistics of unwinding operations. Ethical considerations often revolve around maintaining corporate social responsibility and adhering to international sanctions. Bureaucratic hurdles encompass navigating Russian regulatory requirements and potential governmental pushback (Onopriienko and others 2023). In many cases, the decision proved profitable (Balyuk and Fedyk 2023). However, many companies that stay continue to lobby via respective business associations to reduce pressure on Russia (for example, against freezing of foreign reserves) or participate in working groups to foster Russia's economic development.

The timeline provides some clues as to why the sanctions on Russia had less impact than many had hoped for. First, the initial round of sanctions focused on the financial sector, aiming to drive Russia into a financial crisis that would spiral into an economic one. However, many of the 2022 measures, aside from the freeze on the Bank of Russia's reserve assets, were

21. KSE Institute, "Analytics," Leave Russia Project, accessed September 9, 2024, https://leave-russia.org/bi-analytics?1650483096.

anticipated by Russian authorities, allowing them to mitigate the impact and plan response scenarios. Second, the gradual approach by the United States and the EU to sanctioning Russia's energy exports, which fully took effect only in 2023, created a highly favorable external environment with surging commodity prices, leading to record-breaking export earnings and substantial budget revenues in 2022. Finally, the "Fortress Russia" (Ribakova and others 2020) strategy before the invasion, including robust macroeconomic buffers, low government debt, significant reserves (some currently immobilized), and a well-funded sovereign wealth fund, along with prudent fiscal policies, the Bank of Russia's credible inflation targeting regime, and development of domestic payments infrastructure to reduce reliance on SWIFT and VISA/Mastercard, also helped cushion the impact of sanctions.

As a result, Russian authorities were able to increase government spending, provide sufficient liquidity to banks to prevent spillovers into the real economy through the credit channel, and stabilize the ruble exchange rate via capital controls and financial repression. However, the economy and financial system's resilience in the face of international sanctions should not obscure the fact that Russia's underlying economic vulnerabilities persist and could reemerge quickly.

IV. Impact of Sanctions—An Empirical Assessment

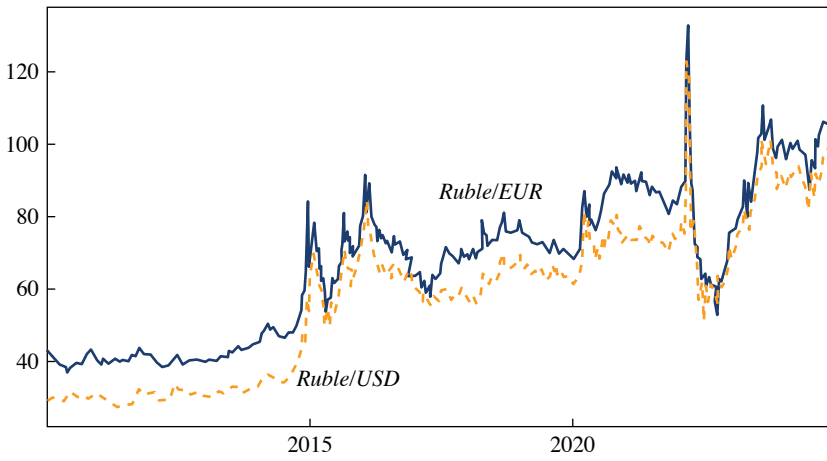
In this section of the paper, we present key empirical evidence regarding the effectiveness of sanctions. We connect these empirical findings to our theoretical model and explore potential avenues for future research. We argue that the critical characteristics of a country—such as its size, integration into global markets, and control over key network nodes like raw materials, infrastructure, and exports—play a significant role. Additionally, we emphasize that enforcement dynamics over time, which have received limited attention in the literature, are crucial.

Had comprehensive sanctions been imposed and effectively enforced immediately after Russia's full-scale invasion of Ukraine, it is plausible that we would have seen a collapse of Russian markets, an economic and financial crisis, and a significantly reduced policy space to address these challenges. While it is difficult to speculate with certainty, losing oil and gas revenues, along with access to critical components in 2022, would likely have made Russia's war effort far more difficult to sustain.

IV.A. Russia 2022—Financial Sanctions

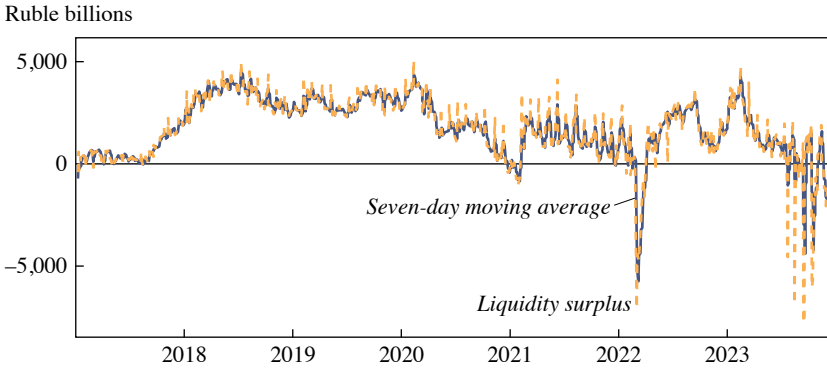
While Russia had time to prepare for possible financial sanctions, as described in section III.A, the immediate impact was severe. Markets collapsed,

Figure 6. Ruble Exchange Rate



Source: Bank of Russia.

Figure 7. Structural Liquidity Surplus of the Banking System



Source: Bank of Russia.

the ruble came under severe pressure (see figure 6), and banks faced severe bank runs requiring substantial liquidity support by the central bank (figure 7). However, not all of the initial capital flight and sharp tightening in financial conditions following the SWIFT exclusion and the freezing of the Bank of Russia's reserves in the West can be attributed to sanctions. Some of it may have been caused by Russian households panicking in the face of uncertainty—like many others, most did not expect Russia to invade a neighboring country. In reality, it is nearly impossible to distinguish between

the direct effects of sanctions and the market panic caused by the sudden worsening of economic prospects due to the war.

During the peak of the crisis, when the demand for cash and foreign currency surged, even Russia's largest state-controlled bank—Sberbank—faced unprecedented runs at its branches and ATMs. Foreign-owned banks were reportedly unable to fulfill their clients' requests for foreign exchange conversion and withdrawals. The banking system shifted to an unprecedented liquidity deficit vis-à-vis the Bank of Russia. Interbank market fragmentation increased, and while many banks still depend on liquidity support from the Bank of Russia, others have accumulated deposits with the Bank of Russia rather than circulating them in the interbank market, likely due to ongoing uncertainty. On the foreign exchange front, Bank of Russia's foreign exchange market turnover hit a historical low, suggesting limited access to foreign currency.

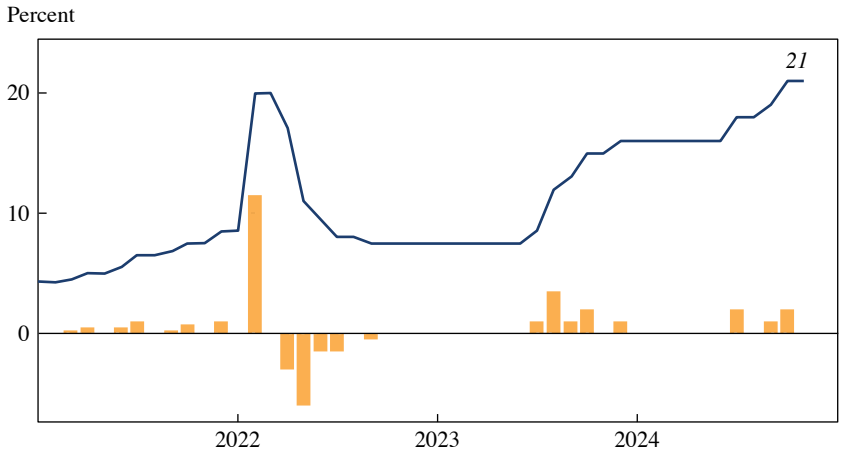
The Bank of Russia responded quickly to sanctions by more than doubling its policy rate from 9.5 percent to 20 percent on February 28, offering targeted liquidity support to the banking sector and implementing strict capital controls.[22] In the initial phase of the crisis, the Bank of Russia intervened in the market to stabilize the ruble, which had come under significant pressure, but had to halt these efforts following the reserve asset freeze and the US-imposed sanctions on it, as confirmed by Governor Elvira Nabiullina at the emergency policy meeting. Despite these measures, the central bank lost $38.8 billion in reserves from February 18 to March 25, reducing total reserves to $604 billion (including about $300 billion in frozen assets). This amount likely encompasses foreign exchange refinancing to local banks and losses from valuation effects. Additionally, Russian authorities temporarily shut down the domestic stock market and limited the number of ruble trading sessions.

Although sanctions have constrained the Bank of Russia's reserve operations, a historically high current account surplus in 2022—$238 billion—enabled Russia to recover the lost reserves relatively quickly (Ribakova, Hilgenstock, and Wolff 2023). While Russia's current account fell in 2023 due to energy sanctions, it remained in a surplus of about $50 billion in 2023.[23]

22. Bank of Russia, "Key Rate," under "Databases: Interest Rates of the Bank of Russia," https://www.cbr.ru/eng/hd_base/KeyRate/.

23. To put the magnitude of these numbers into perspective, the Russian prewar GDP was around $1.85 trillion, Russia's annual imports were around $300 billion, and the Ukrainian prewar GDP was around $200 billion. Russia's annual expenditure on the war in Ukraine is around $150 billion, comparable with Russia's total revenues from oil exports. See International Monetary Fund (2024); Bank of Russia's data on the country's balance of payments,

Figure 8. Bank of Russia Key Policy Rate



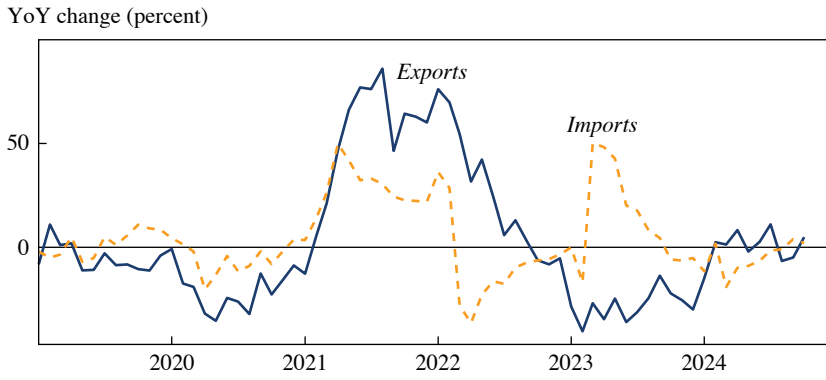
Source: Bank of Russia.
Note: Bars indicate percentage change.

Yet, by April 2022, it became clear that the markets were stabilizing, allowing the Bank of Russia to start removing some of the restrictions and cut rates (figure 8) (Ribakova and Hilgenstock 2022). Russia's financial system pivoted to higher use of the renminbi, reliance on domestic settlement and messaging systems, and digital currencies. The banks' structural liquidity deficit with the Bank of Russia fell sharply and turned into a surplus (figure 7). By 2022–2024, rapid credit expansion became a new problem as Russia's economy pivoted to war production, supported by strong fiscal stimulus.

Russia was successful in stabilizing its economy due to a combination of factors. First, it continued to benefit from a significant inflow of foreign exchange, driven by ongoing energy exports and higher prices throughout 2022. Second, the government implemented decisive policy measures, including capital controls, aggressive interest rate hikes, and regulatory forbearance. Additionally, the Bank of Russia's preparedness since 2014—evident in its enhanced policy tool kit, which included crisis management and emergency lending facilities, as well as a credible inflation targeting regime—played a crucial role in stabilizing the economy.

https://www.cbr.ru/vfs/eng/statistics/credit_statistics/bop/bal_of_payments_standart_e.xlsx; and the news article on Russia's military spending by *Financial Times*, https://www.ft.com/content/c91e1341-ea48-46e0-b87d-353ae113e5b9.

Figure 9. Change in Exports and Imports



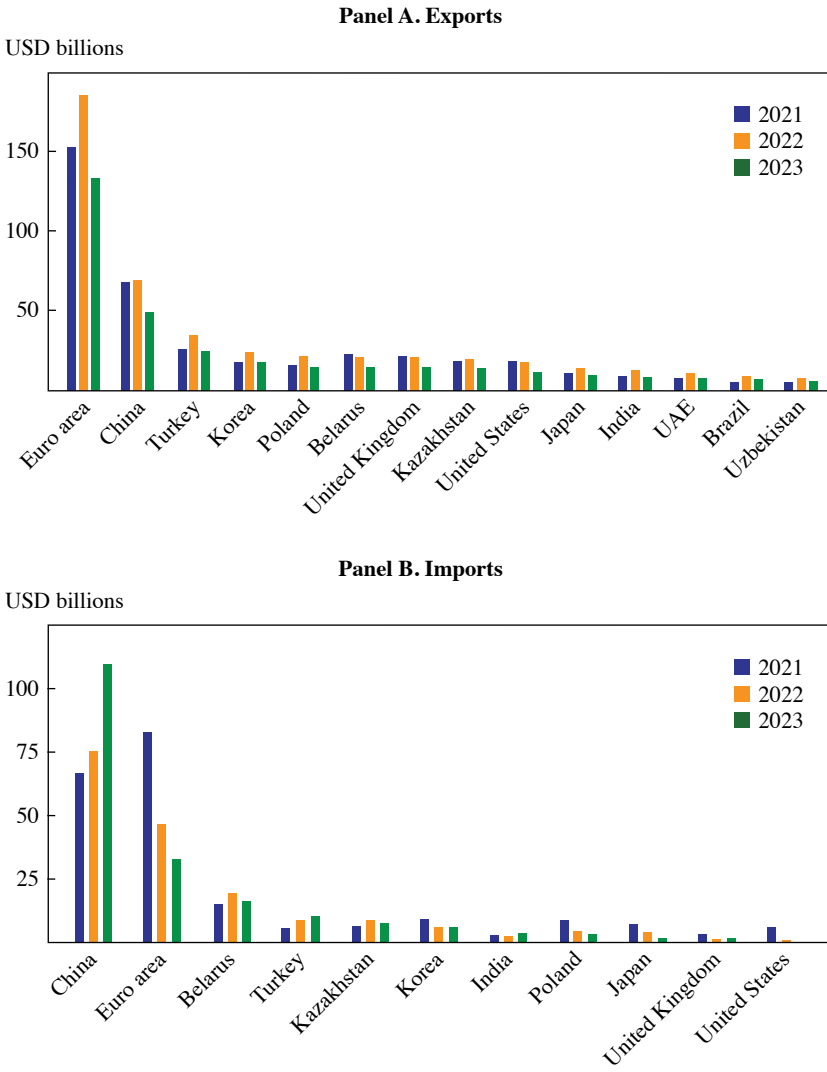
Source: Bank of Russia.

IV.B. Russia 2022—Impact on Trade

In 2022, Russia achieved its highest-ever current account surplus, amounting to $238 billion. While an outsized current account surplus is a natural outcome of the sanctions imposed on Russia in 2022—resulting from increased Russian exports and blocked imports—and does not necessarily indicate economic health, it has enabled Russia to accumulate resources to sustain its war effort. The current account surplus was more than double that of the same period in 2021 and also more than twice the previous record. The surplus was largely driven by soaring commodity prices and a significant import reduction, especially in the initial phase following the full-scale invasion as Russia struggled to access certain products due to export controls and self-sanctioning by companies (figure 9). However, by autumn of 2022, Russia's import volumes began to improve and stabilized largely by the end of 2022. Roughly at the same time, limitations on Russia's exports (oil embargo and price cap) came into force, beginning to erode export revenues.

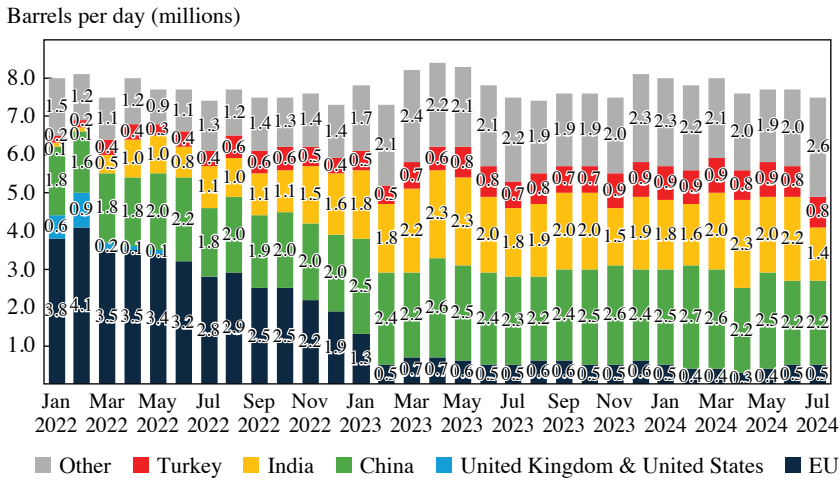
The combination of import and export control measures, as described above, has also resulted in a dramatic redirection of Russia's trade (figure 10). China is now Russia's largest trade partner in its imports. China and India have also replaced the EU as Russia's most significant energy importers (figure 11). This is particularly important for Russia's oil exports, as it has successfully built a shadow fleet that allows it to bypass the oil price cap. Over 90 percent of Russia's crude oil is now shipped without G7 intermediation (Hilgenstock, Hrybanovskii, and Kravtsev 2024). While China has increased its imports of Russian oil, India has emerged as the most significant

Figure 10. Russian External Trade by Partner



Source: International Monetary Fund.

Figure 11. Russian Oil Export Volume by Destination



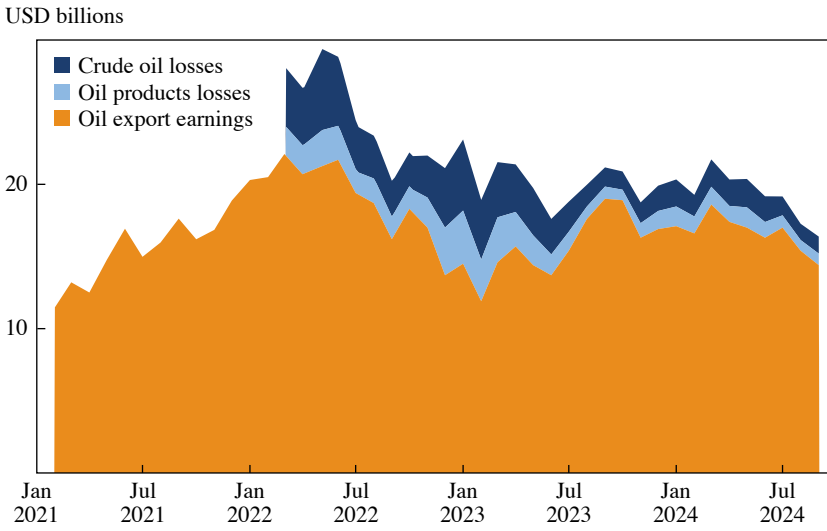
Source: International Energy Agency and KSE Institute.
Note: No March data from International Energy Agency.

beneficiary, largely due to the refining exemption or the so-called refining loophole. This loophole permits refineries outside Russia to refine Russian oil and ship it globally, including to coalition countries opposing Russia's war in Ukraine. The refining exemption was designed with the assumption that Russia's oil would be sold under the price cap, and profits from refining would be diverted away from Russia. However, this has proven ineffective, as Russia partially owns refineries around the world.

Due to logistical challenges, Russia has been unable to redirect gas from the EU to other markets. Over the past three years, Russia's pipeline deliveries to the EU have decreased by 127 billion cubic meters (bcm), while liquified natural gas (LNG) exports have only increased by 5 bcm. Meanwhile, exports to China have risen by just 17 bcm, and negotiations over the Power of Siberia 2 pipeline appear to have stalled (International Working Group on Russian Sanctions 2024a).

Many of the dual-use goods sanctioned by the United States, EU, and other countries against Russia's war on Ukraine find their way to Russia via China (Ribakova 2024c). Russia remains critically dependent on Western technology, with 70–90 percent of its military components sourced from the United States, the EU, and other coalition countries. To continue accessing these components, Russia relies on a network of unscrupulous distributors and companies that pose as end users in third countries and then redirect the flow of goods to Russia. The fact that Western companies have not been compelled to invest in thorough due diligence processes makes it easier for

Figure 12. Lost Oil Export Earnings Due to War and Sanctions



Source: International Energy Agency; KSE Institute; and authors' calculations.

these diversions to go unnoticed and underreported to authorities. Countries such as China, United Arab Emirates, Turkey, Kazakhstan, and other former Soviet countries have benefited greatly from this trade diversion. For example, in 2022–2023, Turkey emerged as one of the key exporters of chips to Russia, after China, despite not being a producer itself.

While we have seen a reduction in Russia's export earnings due to war and sanctions, extensive oil price cap attestation fraud, Russia's expanding shadow fleet, and higher commodity prices mean that Russia's compliance with the oil price cap recently has been minimal. The discount on Russian oil has decreased from its peak of $30 per barrel to $10 per barrel (Hilgenstock and others 2023). As a result, Russia's current account surplus is expected to exceed $60 billion in 2024, up from $50 billion in 2023. While the oil price cap and the EU embargo caused Russia to lose an estimated $85 billion since December 2022, the impact has been much lower in recent months (figure 12).

Almost simultaneously with financial sanctions, a coalition of countries imposed export controls to Russia. These controls, alongside the private sector self-sanctioning, caused Russia's imports to fall dramatically. However, as time passed, Russia found workarounds, with many products finding their way to Russia via third countries, be it the EU (Borin and others 2023) or the US components, technology, and equipment (International Working Group on Russian Sanctions 2024b). To curb circumvention, the United States, the EU, the United Kingdom, and some of their allies have

Figure 13. Russian Imports of Battlefield Goods

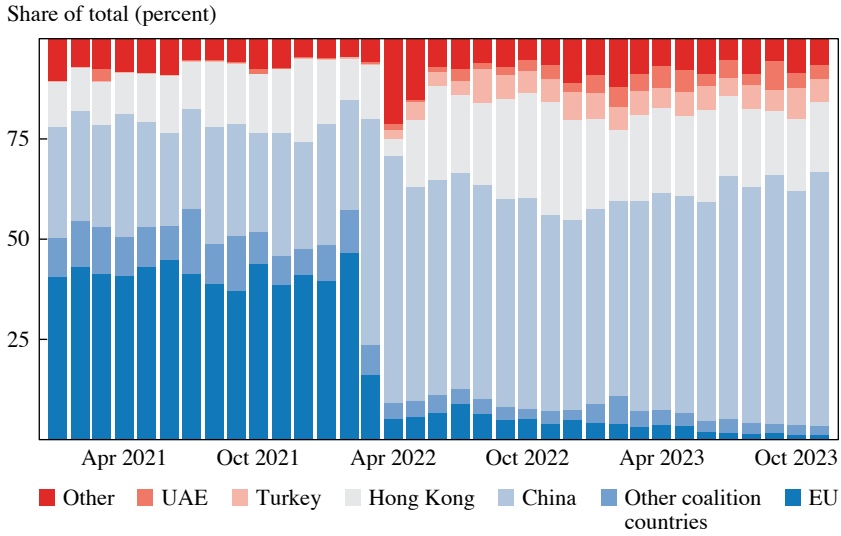
Source: KSE Institute.
Note: See the Common High Priority List of six-digit Harmonized System (HS) codes published by BIS in coordination with the EU, Japan, and the United Kingdom (BIS 2024).

joined forces to strengthen enforcement. This included streamlining procedures, creating high-priority lists of goods critical for Russian military production—battlefield goods—and finding ways to target third countries, whether through threats of secondary sanctions or by leveraging entire trade relationships (figure 13).

Nonetheless, the flow of the battlefield goods to Russia via third countries continued, albeit at higher prices. China plays a critical role in this trade diversion (figure 14). While China currently lacks the necessary technology to produce substitutes for Western goods, it has become a key player in facilitating the rerouting of these goods to Russia and other destinations. At present, China functions primarily as a transshipment hub, acting as an intermediary rather than replacing Western products with its own. By leveraging its extensive manufacturing network and logistical infrastructure, China helps divert goods that would otherwise be restricted by sanctions, enabling them to reach their intended markets, including Russia. However, until China can develop or acquire the advanced technology required to manufacture its own high-tech alternatives, it will likely continue to serve this intermediary role in the global supply chain.

Starting in 2023, the focus of sanctions shifted toward improving enforcement and leveraging the financial sector to ensure compliance through

Figure 14. Russian Imports of Battlefield Goods by Country of Dispatch



Source: KSE Institute.

innovative measures such as the oil price cap and export controls (Hilgenstock and others 2023, 2024). A pivotal moment in this effort was the December 2023 executive order issued by President Biden, which played a crucial role in strengthening the sanctions regime.[24] Initially, the mere threat of sanctions and the uncertainty surrounding the regime were sufficient to compel companies and countries to sever ties with Russia. However, over time, Russia discovered workarounds as black knights emerged and the perceived risk of noncompliance diminished. Consequently, the renewed threat of secondary sanctions in the financial and payment systems became essential in maintaining pressure and ensuring adherence to the sanctions framework.

V. Conclusion

Sanctions are an important tool in the arsenal of economic statecraft, but they are not a magic wand for resolving geopolitical conflicts. Our analysis reveals that while sanctions can be impactful, their success often hinges on the clarity of their objectives and the robustness of their enforcement. Furthermore, sanctions are likely more effective when implemented decisively

24. Exec. Order No. 14114, 88 Fed. Reg. 89271 (December 22, 2023).

and comprehensively, rather than through a piecemeal approach, which allows the target country to adapt gradually. It is crucial to acknowledge that unrealistic or conflicting goals can undermine the effectiveness of sanctions, especially when enforcement is inadequate. This nuanced understanding highlights that sanctions are not inherently ineffective but must be tailored to achieve specific, attainable objectives to maximize their impact.

The sanctions imposed on Russia following its 2022 full-scale invasion of Ukraine as well as those imposed since 2014 provide important lessons in this regard. On one hand, sanctions did impose substantial costs on Russia. However, their design, particularly in 2022—allowing energy exports to continue due to Russia's integration into global commodity markets and concerns about cost to the sender—limited their overall effectiveness. Additionally, the timing of the sanctions, with a gradual rather than immediate imposition, and the leakages caused by insufficient enforcement and the lucrative nature of Russia's exports further diluted their impact. Finally, the 2014 sanctions and the subsequent policy debate on the escalation ladder gave Russia a forewarning on what to prepare for next.

The involvement of black knights, nations like China, Turkey, and United Arab Emirates, which helped Russia find ways to circumvent the sanctions, demonstrates the complexity of maintaining a unified and effective sanctions regime. This emphasizes the trade-off between open-ended sanctions, with vague terms and enforcement, versus sanctions with clear objectives, enforcement, and conditions for removal. The former may be effective to send a signal and contain future escalation of the conflict. Such sanctions may backfire in an all-out conflict, where clear structure of sanctions and firm commitment to enforce them with secondary sanctions on third countries become most effective.

Moreover, the scale of Russia's economy and its substantial share in global commodity markets made sanctions particularly challenging. Russia's size and economic leverage meant that sanctions resembled a decoupling process, which had more symmetrical impacts on both sides. This scenario suggests that smaller countries might experience more pronounced deterrent effects from similar sanctions, while larger, economically integrated nations might find ways to mitigate their impact.

The ultimate question remains whether sanctions could have caused a change in the course of Russia's war on Ukraine. Had the West imposed decisive sanctions and enforced them already in 2022, would we have seen a more significant result? Furthermore, once deterrence failed and Russia invaded Ukraine in 2022, did the West blunder by not throwing all that it had at Russia? Given "Fortress Russia" preparations, the country size,

and its relationships with circumventing countries, it is debatable whether sanctions alone could have put an end to the war. Sanctions are only one tool among many that must be used in settling international conflicts. The effectiveness of sanctions in other contexts, such as North Korea, Iran, Cuba, and Venezuela, suggests that while they may not always lead to immediate regime change or major policy shifts, they still play a crucial role in containment.

The experience with sanctions against Russia provides important insights for refining future policies. It is essential to differentiate between sanctions *in theory* and *in practice*, with a focus on enforcement and strategic clarity. By addressing these aspects, policymakers can enhance the effectiveness of sanctions and better leverage them as a tool of foreign policy.

ACKNOWLEDGMENTS The authors are grateful to the *BPEA* conference organizers Jan Eberly and Jón Steinsson; to the discussants Robin Brooks, Rory MacFarquhar, and Gabriel Felbermayr; to the conference participants at Brookings and at the Kiel Institute for helpful comments; and to Tom Basin, Ekaterina Gurkova, Chang He, and Lucas Risinger for excellent research assistance.

References

Ahn, Daniel P., and Rodney D. Ludema. 2019. "Measuring Smartness: The Economic Impact of Targeted Sanctions Against Russia." In *Disrupted Economic Relationships: Disasters, Sanctions, Dissolutions*, edited by Tibor Besedes and Volker Nitsch. Cambridge, Mass.: MIT Press.

Alekseev, Maxim, and Xinyue Lin. 2024. "Trade Policy in the Shadow of Conflict: The Case of Dual-Use Goods." Working Paper, October. https://maximalekseev.com/.

Arkolakis, Costas, Arnaud Costinot, and Andrés Rodríguez-Clare. 2012. "New Trade Models, Same Old Gains?" *American Economic Review* 102, no. 1: 94–130. https://doi.org/10.1257/aer.102.1.94.

Bachmann, Rüdiger, David Baqaee, Christian Bayer, Moritz Kuhn, Andreas Löschel, Benjamin Moll, Andreas Peichl, Karen Pittel, and Moritz Schularick. 2024. "What If? The Macroeconomic and Distributional Effects for Germany of a Stop of Energy Imports from Russia." *Economica* 91, no. 364: 1157–200. https://doi.org/10.1111/ecca.12546.

Baker, Stephanie. 2024. *Punishing Putin: Inside the Global Economic War to Bring Down Russia*. New York: Scribner.

Baldwin, David A. 2020. *Economic Statecraft*. New edition. Princeton, N.J.: Princeton University Press.

Balyuk, Tetyana, and Anastassia Fedyk. 2023. "Divesting Under Pressure: U.S. Firms' Exit in Response to Russia's War Against Ukraine." *Journal of Comparative Economics* 51, no. 4: 1253–73. https://doi.org/10.1016/j.jce.2023.08.001.

Baqaee, David Rezza, and Emmanuel Farhi. 2024. "Networks, Barriers, and Trade." *Econometrica* 92, no. 2: 505–41. https://doi.org/10.3982/ECTA17513.

Barbiero, Omar, Emmanuel Farhi, Gita Gopinath, and Oleg Itskhoki. 2019. "The Macroeconomics of Border Taxes." *NBER Macroeconomics Annual* 33: 395–457. https://doi.org/10.1086/700897.

Becko, John Sturm. 2024. "A Theory of Economic Sanctions as Terms-of-Trade Manipulation." *Journal of International Economics* 150: 103898. https://doi.org/10.1016/j.jinteco.2024.103898.

Becko, John Sturm, and Daniel G. O'Connor. 2024. "Strategic (Dis)Integration." Working Paper, March. https://sturm-econ.s3.amazonaws.com/Strategic+%28Dis%29Integration.pdf.

Bianchi, Javier, and Cesar Sosa-Padilla. 2023. "The Macroeconomic Consequences of International Financial Sanctions." *American Economic Association: Papers and Proceedings* 113: 29–32. https://doi.org/10.1257/pandp.20231042.

Bilousova, Olena, Benjamin Hilgenstock, Elina Ribakova, Nataliia Shapoval, Anna Vlasyuk, and Vladyslav Vlasiuk. 2024. *Challenges of Export Controls Enforcement: How Russia Continues to Import Components for Its Military Production*. Kyiv: Yermak-McFaul International Working Group on Russian Sanctions & KSE Institute. https://kse.ua/wp-content/uploads/2024/01/Challenges-of-Export-Controls-Enforcement.pdf.

Blackwill, Robert D., and Jennifer M. Harris. 2016. *War by Other Means: Geoeconomics and Statecraft*. Cambridge, Mass.: Harvard University Press.

Boehm, Christoph E., Andrei A. Levchenko, and Nitya Pandalai-Nayar. 2023. "The Long and Short (Run) of Trade Elasticities." *American Economic Review* 113, no. 4: 861–905. https://doi.org/10.1257/aer.20210225.

Borin, Alessandro, Gabriele Cappadona, Francesco Paolo Conteduca, Benjamin Hilgenstock, Oleg Itskhoki, Michele Mancini, Maxim Mironov, and Elina Ribakova. 2023. "The Impact of EU Sanctions on Russian Imports." *VoxEU*, May 29. https://cepr.org/voxeu/columns/impact-eu-sanctions-russian-imports.

Broner, Fernando, Alberto Martin, Josefin Meyer, and Christoph Trebesch. 2024. "Hegemonic Globalization." Working Paper, September 19. https://crei.cat/wp-content/uploads/2024/09/BMMT-1.pdf.

Bureau of Industry and Security (BIS). 2024. "Russia Export Controls—List of Common High-Priority Items." US Department of Commerce, February 23. https://www.bis.doc.gov/index.php/all-articles/13-policy-guidance/country-guidance/2172-russia-export-controls-list-of-common-high-priority-items.

Clayton, Christopher, Matteo Maggiori, and Jesse Schreger. 2023. "A Framework for Geoeconomics." Working Paper 31852. Cambridge, Mass.: National Bureau of Economic Research. https://doi.org/10.3386/w31852.

Clayton, Christopher, Matteo Maggiori, and Jesse Schreger. 2024. "A Theory of Economic Coercion and Fragmentation." Working Paper. https://globalcapitalallocation.s3.us-east-2.amazonaws.com/CMS_fragmentation.pdf.

Costinot, Arnaud, and Andrés Rodríguez-Clare. 2014. "Trade Theory with Numbers: Quantifying the Consequences of Globalization." In *Handbook of International Economics, Vol. 4*, edited by Gita Gopinath, Elhanan Helpman, and Kenneth Rogoff. Amsterdam: North-Holland. https://doi.org/10.1016/B978-0-444-54314-1.00004-5.

Council of Economic Advisers. 2023. *Economic Report of the President*. Washington: White House Council of Economic Advisers. https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/03/ERP-2023.pdf.

Crozet, Matthieu, and Julian Hinz. 2020. "Friendly Fire: The Trade Impact of the Russia Sanctions and Counter-Sanctions." *Economic Policy* 35, no. 101: 97–146. https://doi.org/10.1093/epolic/eiaa006.

Demarais, Agathe. 2022. *Backfire: How Sanctions Reshape the World Against U.S. Interests*. New York: Columbia University Press.

Demertzis, Maria, Benjamin Hilgenstock, Ben McWilliams, Elina Ribakova, and Simone Tagliapietra. 2022. "How Have Sanctions Impacted Russia?" *Policy Contribution* 18. Brussels: Bruegel. https://www.bruegel.org/policy-brief/how-have-sanctions-impacted-russia.

De Souza, Gustavo, Naiyuan Hu, Haishi Li, and Yuan Mei. 2024. "(Trade) War and Peace: How to Impose International Trade Sanctions." *Journal of Monetary Economics* 146: 103572. https://doi.org/10.1016/j.jmoneco.2024.103572.

Egorov, Konstantin, Vasily Korovkin, Alexey Makarin, and Dzhamilya Nigmatulina. 2025. "Trade Sanctions Against Russia: Stylized Facts." Working Paper, Social Science Research Network, January 31. https://dx.doi.org/10.2139/ssrn.5119772.

Fajgelbaum, Pablo D., Pinelopi K. Goldberg, Patrick J. Kennedy, and Amit K. Khandelwal. 2020. "The Return to Protectionism." *Quarterly Journal of Economics* 135, no. 1: 1–55. https://doi.org/10.1093/qje/qjz036.

Farhi, Emmanuel, Gita Gopinath, and Oleg Itskhoki. 2014. "Fiscal Devaluations." *Review of Economic Studies* 81, no. 2: 725–60.

Farrell, Henry, and Abraham L. Newman. 2023. *Underground Empire: How America Weaponized the World Economy*. New York: Henry Holt and Company.

Felbermayr, Gabriel J., Constantinos Syropoulos, Erdal Yalcin, and Yoto V. Yotov. 2019. "On the Effects of Sanctions on Trade and Welfare: New Evidence Based on Structural Gravity and a New Database." CESifo Working Paper 7728. Munich: Munich Society for the Promotion of Economic Research—CESifo GmbH.

Free Russia Foundation. 2023. *Effectiveness of U.S. Sanctions Targeting Russian Companies and Individuals*. Washington: Free Russia Foundation. https://thinktank.4freerussia.org/wp-content/uploads/2023/01/frf-sanctions-web.pdf.

Ghironi, Fabio, Daisoon Kim, and G. Kemal Ozhan. 2024. "International Trade and Macroeconomic Dynamics with Sanctions." Working Paper 32188. Cambridge, Mass.: National Bureau of Economic Research. https://doi.org/10.3386/w32188.

Gorodnichenko, Yuriy, Iikka Korhonen, and Elina Ribakova. 2024. "Russian Economy on War Footing: A New Reality Financed by Commodity Exports." Policy Insight 131. Paris & London: CEPR Press. https://cepr.org/publications/policy-insight-131-russian-economy-war-footing-new-reality-financed-commodity-exports.

Guriev, Sergei, and Oleg Itskhoki. 2022. "Warum ein Embargo Putins Krieg beenden könnte" ["The Economic Rationale for Oil and Gas Embargo on Putin's Regime"]. *Spiegel Wirtschaft*, March 22. Expanded version in English is available at: https://www.dropbox.com/scl/fi/6eaeexm6tyerpc0fsehel/Guriev-Itskhoki.pdf?rlkey=nnb6i25t9xwj8vulvb4m3ay8i&e=2&dl=0

Gutmann, Jerg, Matthias Neuenkirch, and Florian Neumeier. 2023. "The Economic Effects of International Sanctions: An Event Study." *Journal of Comparative Economics* 51, no. 4: 1214–31. https://doi.org/10.1016/j.jce.2023.05.005.

Harrison, Mark. 2023. "Economic Warfare: Lessons from Two World Wars." Discussion Paper 18439. Paris & London: CEPR Press. https://cepr.org/publications/dp18439.

Hausmann, Ricardo, Ulrich Schetter, and Muhammed A. Yildirim. 2024. "On the Design of Effective Sanctions: The Case of Bans on Exports to Russia." *Economic Policy* 39, no. 117: 109–53. https://doi.org/10.1093/epolic/eiad043.

Head, Keith, and Thierry Mayer. 2014. "Gravity Equations: Workhorse, Toolkit, and Cookbook." In *Handbook of International Economics, Vol. 4*, edited by Gita Gopinath, Elhanan Helpman, and Kenneth Rogoff. Amsterdam: North-Holland. https://doi.org/10.1016/B978-0-444-54314-1.00003-3.

Helpman, Elhanan. 2011. *Understanding Global Trade*. Cambridge, Mass.: Harvard University Press. https://doi.org/10.2307/j.ctt24hhh9.

Hilgenstock, Benjamin, Oleksii Hrybanovskii, and Anatoliy Kravtsev. 2024. *Assessing Russia's Shadow Fleet: Initial Build-Up, Links to the Global Shadow Fleet, and Future Prospects*. Kyiv: KSE Institute. https://sanctions.kse.ua/wp-content/uploads/2024/06/Global-Shadow-Fleet-June-2024.pdf.

Hilgenstock, Benjamin, Anatoliy Kravtsev, and Yuliia Pavytska. 2024. *The Core of Russia's Shadow Fleet: Identifying Targets for Future Tanker Designations*.

Kyiv: KSE Institute. https://sanctions.kse.ua/wp-content/uploads/2024/08/KSE_core_shadow_fleet.pdf.

Hilgenstock, Benjamin, Elina Ribakova, Nataliia Shapoval, Tania Babina, Oleg Itskhoki, and Maxim Mironov. 2023. "Russian Oil Exports Under International Sanctions." Working Paper, Social Science Research Network, May 9. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4430053.

Hilgenstock, Benjamin, Elina Ribakova, and Guntram B. Wolff. 2023. "Toughening Financial Sanctions on Russia." *Intereconomics: Review of European Economic Policy* 58, no. 4: 201–8.

Hilgenstock, Benjamin, Elina Ribakova, Guntram B. Wolff, and Anna Vlasyuk. 2024. "Using the Financial System to Enforce Export Controls." Working Paper. Brussels: Bruegel.

Hufbauer, Gary Clyde, Jeffrey J. Schott, Kimberly Ann Elliott, and Barbara Oegg. 2009. *Economic Sanctions Reconsidered, 3rd Edition*. Washington: Peterson Institute for International Economics.

International Monetary Fund. 2024. "World Economic Outlook Database: October 2024 Edition." https://www.imf.org/en/Publications/WEO/weo-database/2024/October.

International Working Group on Russian Sanctions. 2024a. "The Path Forward on Energy Sanctions: A Toolkit to Step Up Pressure on Russia in 2025." Working Paper 21. Stanford, Calif.: Stanford University. https://fsi9-prod.s3.us-west-1.amazonaws.com/s3fs-public/2024-11/working_paper_21_energy_sanctions_11-15-2024_final2.pdf.

International Working Group on Russian Sanctions. 2024b. "Export Controls: A Key G-7 Tool to Halt Russia's War." Working Paper 20. Stanford, Calif.: Stanford University. https://fsi9-prod.s3.us-west-1.amazonaws.com/s3fs-public/2024-06/working_paper_20_export_controls_june_12_2024_final_update.pdf.

Itskhoki, Oleg. 2023. "Crisis in Abundance: Why Did the Russian Economy Fail to Collapse and Is There a Crisis on the Horizon?" Re: Russia, January 26. https://re-russia.net/en/expertise/051/.

Itskhoki, Oleg, and Dmitry Mukhin. 2022. "Sanctions and the Exchange Rate." Working Paper 30009. Cambridge, Mass.: National Bureau of Economic Research. https://doi.org/10.3386/w30009.

Itskhoki, Oleg, and Dmitry Mukhin. 2023a. "International Sanctions and Limits of Lerner Symmetry." *American Economic Association: Papers and Proceedings* 113: 33–38. https://doi.org/10.1257/pandp.20231043.

Itskhoki, Oleg, and Dmitry Mukhin. 2023b. "The Economics of International Sanctions." Paper prepared for the 7th Annual Macroprudential Conference, Stockholm, August 30–31. https://www.riksbank.se/globalassets/media/konferenser/2023/session-3-itskhoki_mukhin-economics-of-international-sanctions.pdf.

Keerati, Ritt. 2024. "The Unintended Consequences of Financial Sanctions." Working Paper, Social Science Research Network, April 18. https://doi.org/10.2139/ssrn.4049281.

Kilcrease, Emily. 2022. "The New Russia Export Controls." Noteworthy, Center for a New American Security, March 7. https://www.cnas.org/press/press-note/noteworthy-the-new-russia-export-controls.

Kilian, Lutz, David Rapson, and Burkhard C. Schipper. 2024. "The Impact of the 2022 Oil Embargo and Price Cap on Russian Oil Prices." Working Paper 2401. Dallas, Tex.: Federal Reserve Bank of Dallas. https://doi.org/10.24149/wp2401.

Kim, Younghoon. 2024. "When Export Controls Backfire: Evidence from 2019 Korea-Japan Trade Dispute." Working Paper, May. https://younghoon-econ.github.io/YKim_JMP.pdf.

KSE Institute. 2024. "Energy Sanctions Impact Summary–July 2024." Sectoral Report. Kyiv: KSE Institute. https://sanctions.kse.ua/wp-content/uploads/2024/08/Energy-Sanctions-Impact-Summary-July-2024.pdf.

Lerner, A. P. 1936. "The Symmetry Between Import and Export Taxes." *Economica* 3, no. 11: 306–13. https://doi.org/10.2307/2549223.

Livdan, Dmitry, Norman Schürhoff, and Vladimir Sokolov. 2024. "The Economic Impact of Payment System Stress: Evidence from Russia." Working Paper, July 1. https://conference.nber.org/conf_papers/f199847.pdf.

Lorenzoni, Guido, and Iván Werning. 2023. "A Minimalist Model for the Ruble During the Russian Invasion of Ukraine." *American Economic Review: Insights* 5, no. 3: 347–56. https://doi.org/10.1257/aeri.20220303.

Lowery, Clay, Elina Ribakova, Benjamin Hilgenstock, and Greer Meisels. 2022a. *Russia Sanctions: Adapting to a Moving Target*. Washington: Institute of International Finance. https://drive.google.com/file/d/1Yg9SX0GWMO_HxPEf9CafFj3xyRAaGiat/view.

Lowery, Clay, Elina Ribakova, Benjamin Hilgenstock, Greer Meisels, and Jessica Renier. 2022b. *Russia Sanctions: Climbing the Escalation Ladder*. Washington: Institute of International Finance.

Miller, Chris. 2022. *Chip War: The Fight for the World's Most Critical Technology*. New York: Scribner.

Mohsin, Saleha. 2024. *Paper Soldiers: How the Weaponization of the Dollar Changed the World Order*. New York: Portfolio/Penguin.

Moll, Benjamin, Moritz Schularick, and Georg Zachmann. 2023. "The Power of Substitution: The Great German Gas Debate in Retrospect." *Brookings Papers on Economic Activity*, Fall: 395–455.

Mulder, Nicholas. 2023. *The Economic Weapon: The Rise of Sanctions as a Tool of Modern War*. New Haven, Conn.: Yale University Press.

Ndiaye, Abdoulaye. 2024. "A Theory of International Boycotts." Working Paper, Social Science Research Network, April 8. https://doi.org/10.2139/ssrn.4737199.

Nigmatulina, Dzhamilya. 2023. "Sanctions and Misallocation. How Sanctioned Firms Won and Russia Lost." Discussion Paper 1886. London: Centre for Economic Performance.

Office of Foreign Assets Control (OFAC). 2025. "Sectoral Sanctions Identifications List." Washington: US Department of the Treasury. https://www.treasury.gov/ofac/downloads/ssi/ssilist.pdf.

Olson, Mancur. 1963. *The Economics of the Wartime Shortage: A History of British Food Supplies in the Napoleonic War and in World Wars I and II*. Durham, N.C.: Duke University Press.

Onopriienko, Andrii, Nataliia Shapoval, Elina Ribakova, Oleksii Hrybanovskyi, Nataliia Rybalko, Benjamin Hilgenstock, Yuliia Pavytska, and Olena Bilousova. 2023. "Analysis of Foreign Business Exits from Russia." Working Paper, Social Science Research Network, November 29. https://doi.org/10.2139/ssrn.4648135.

Ossa, Ralph. 2015. "Why Trade Matters After All." *Journal of International Economics* 97, no. 2: 266–77. https://doi.org/10.1016/j.jinteco.2015.07.002.

Portes, Richard, Christian Gollier, Thomas Philippon, and Eric Chaney. 2022. "Economics and Politics of Measures to Stop Financing Russian Aggression Against Ukraine." *VoxEU*, March 22. https://cepr.org/voxeu/columns/economics-and-politics-measures-stop-financing-russian-aggression-against-ukraine.

Prusa, Thomas J. 2008. "Book Review on *Economic Sanctions Reconsidered*, 3rd edition, by Gary Hufbauer, Jeffrey Schott, Kimberly Elliott, and Barbara Oegg." *Journal of International Economics* 76, no. 1: 135–37. https://doi.org/10.1016/j.jinteco.2008.06.002.

Ribakova, Elina. 2024a. "Our Experience with Russia Holds Lessons for Future Sanctions." *Financial Times*, February 27. https://www.ft.com/content/784eae1d-1fb8-455b-b3d3-2ddc4715499d.

Ribakova, Elina. 2024b. "Russia's New Economy May End Up Prolonging Its War." *Financial Times*, May 2. https://www.ft.com/content/3fd6b61b-f9f4-47dc-9369-27909868a0b6.

Ribakova, Elina. 2024c. "The U.S. Technology Fueling Russia's War in Ukraine: How and Why." Testimony, Senate Committee on Homeland Security and Government Affairs, February 27. https://www.hsgac.senate.gov/wp-content/uploads/Ribakova-Testimony-Feb.-27-2024-Updated.pdf.

Ribakova, Elina, and Benjamin Hilgenstock. 2022. "Russia Sanctions: Financial Sector Stabilizing." Macro Notes, Institute of International Finance, April 6. https://sanctions.kse.ua/wp-content/uploads/2022/09/Russia-Sanctions_-Financial-Sector-Stabilizing.pdf.

Ribakova, Elina, Benjamin Hilgenstock, Greer Meisels, and Stefan Gringel. 2020. *Market Interventions: The Case of U.S. Sanctions on Russia*. Washington: Institute of International Finance. https://github.com/Eribakova/Publications/blob/main/02_19_2020_WhitePaper_Sanctions_ERibakova.pdf.

Ribakova, Elina, Benjamin Hilgenstock, and Guntram B. Wolff. 2023. "The Oil Price Cap and Embargo on Russia Are Working Imperfectly, and Defects Must Be Fixed." *Realtime Economics*, Peterson Institute for International Economics, July 13. https://www.piie.com/blogs/realtime-economics/oil-price-cap-and-embargo-russia-are-working-imperfectly-and-defects-must.

Rosenberg, Elizabeth, and Eric Van Nostrand. 2023. "The Price Cap on Russian Oil: A Progress Report." Featured Story, US Department of the Treasury, May 18. https://home.treasury.gov/news/featured-stories/the-price-cap-on-russian-oil-a-progress-report.

Ruhl, Kim J. 2008. "The International Elasticity Puzzle." Working Paper, March. https://static1.squarespace.com/static/562636cfe4b043d43a7492bf/t/5792348829687f7eedd56a8c/1469199496414/ElasticityMarch08.pdf.

Scarpino, Rowan, and Jocelyn Trainer. 2024. *Sanctions by the Numbers: 2023 Year in Review*. Washington: Center for a New American Security. https://www.cnas.org/publications/reports/sanctions-by-the-numbers-2023-year-in-review.

Seddon, Max, Chris Cook, and Anastasia Stognei. 2024. "Gazprom Badly Hurt by Ukraine War, Says Company-Commissioned Report." *Financial Times*, June 5. https://www.ft.com/content/21f8f63f-80d6-455f-abf8-fce269d70319.

Stubbs, Jack, and Patricia Zengerle. 2018. "U.S. Hits Russian Deputy Minister and Energy Firms with Sanctions." Reuters, January 26. https://www.reuters.com/article/world/us-hits-russian-deputy-minister-and-energy-firms-with-sanctions-idUSKBN1FF2IS/.

Timofeev, Ivan. 2023. "Does Russia Have 'Black Knights'?" Opinion, Valdai Discussion Club, March 31. https://valdaiclub.com/a/highlights/does-russia-have-black-knights-/.

Van Nostrand, Eric, and Anna Morris. 2024. "Phase Two of the Price Cap on Russian Oil: Two Years After Putin's Invasion." Featured Story, US Department of the Treasury, February 23. https://home.treasury.gov/news/featured-stories/phase-two-of-the-price-cap-on-russian-oil-two-years-after-putins-invasion.

Welt, Cory, Kristin Archick, Rebecca Nelson, and Dianne Rennack. 2022. *U.S. Sanctions on Russia Before 2022*. Washington: Congressional Research Service. https://crsreports.congress.gov/product/pdf/R/R45415/12.

Zarate, Juan C. 2013. *Treasury's War: The Unleashing of a New Era of Financial Warfare*. New York: PublicAffairs.

Comments and Discussion

COMMENT BY
ROBIN BROOKS

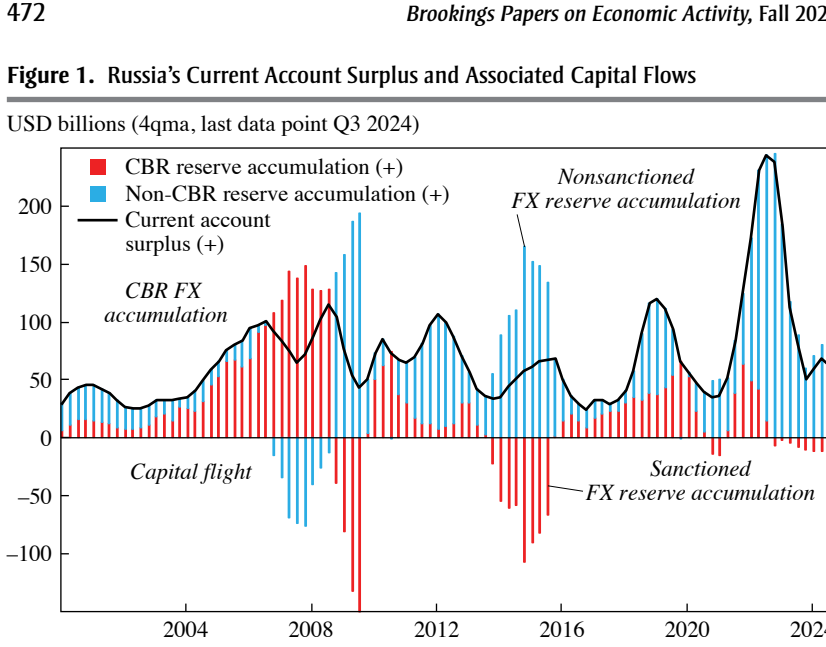
DID WESTERN SANCTIONS ON RUSSIA FAIL? Western sanctions on Russia had two main objectives: (1) damage Russia's economy, making it harder for Putin to pursue his invasion of Ukraine; and (2) deter other aggressor countries, thereby preventing future conflict. It is fair to say that sanctions failed on both counts and—in the popular narrative—much of this gets blamed on sanctions themselves. That is not correct, and I will use the first part of my discussion to shed light on what I see as the true issues: an overreliance by the West on financial sanctions, which are largely ineffective for a current account surplus country like Russia, and successful lobbying by Western companies to water down the Group of Seven (G7) oil price cap before it even came into effect, undermining the one measure that had genuine potential to damage Russia. I will then use this background to discuss the paper and lessons for policymakers.

WESTERN OVERRELIANCE ON FINANCIAL SANCTIONS When Russia invaded Ukraine in February 2022, the West quickly defaulted to financial sanctions, including freezing Russia's official foreign exchange (FX) reserves and outright sanctions of some Russian banks, including its central bank, preventing them from using Western payment infrastructure to intermediate financial flows. A much less onerous version of such sanctions in 2018 caused economic activity in Turkey to collapse, so why did Russia not suffer a similar fate?

Russia is a current account surplus country, unlike Turkey, which historically runs deficits. Turkey is thus a borrower on global capital markets, making it uniquely vulnerable to financial sanctions, while Russia is a lender

Brookings Papers on Economic Activity, Fall 2024: 471–497

Figure 1. Russia's Current Account Surplus and Associated Capital Flows



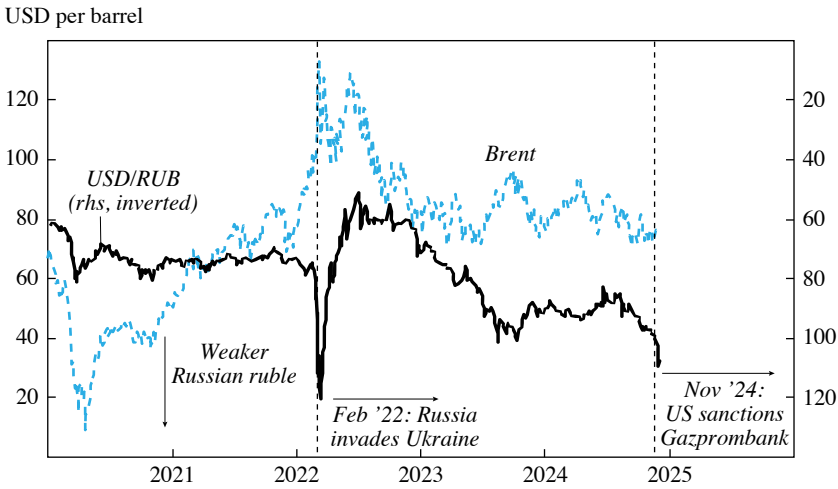
Source: Haver Analytics.

that accumulates foreign assets as a counterpart to its current account surplus. When the West sanctioned some Russian banks, it caused this foreign asset accumulation to shift from sanctioned to nonsanctioned institutions, but it did not in any way curtail Russia's access to global capital markets or its ability to accumulate foreign assets.

Figure 1 illustrates this. It shows Russia's current account surplus (black line) and foreign asset accumulation as its counterpart. Historically, Central Bank of Russia (CBR) played a big role in accumulating foreign assets, building up official FX reserves as counterpart to the current account surplus, but sanctions ended this in February 2022. Instead, foreign asset accumulation shifted to nonsanctioned banks, especially Gazprombank, which remained unsanctioned as the European Union (EU) countries needed a way to pay Russia for natural gas imports. In effect, by sanctioning only some banks, the West picked winners and losers in Russia's financial system, but in no way constrained its ability to run large current account surpluses and accumulate substantial foreign assets.

The obvious fix to this would have been to sanction all banks, but that would have been equivalent to a full trade embargo, since this would have made it impossible to pay Russia for its energy exports. As noted above, the

Figure 2. Value of Russian Ruble



Source: Haver Analytics.

EU opposed this, since it needed to keep importing natural gas. This shows, however, what is needed to hit a current account surplus country: measures that target exports as opposed to financial flows. The G7 oil price cap on Russia—which aims to put an upper bound on the income Russia receives for its seaborne oil exports—is recognition of this and was an important and needed step forward in the West's toolbox.

The recent broadening of US sanctions to cover more banks, including Gazprombank, underscores this point.[1] This widening in the scope of financial sanctions is a step in the right direction and has coincided with a sharp fall in the value of the Russian ruble (figure 2). This shows that financial sanctions certainly had the potential to sharply tighten financial conditions in Russia, thus hurting its economy, but they needed to be imposed on as much of the financial system as possible.

UNDERMINING OF THE G7 OIL PRICE CAP ON RUSSIA There is a lot of justified focus on poor enforcement of Western sanctions on Russia. You can think of this as an ex post concept. Sanctions are basically rules that say

1. The US Treasury expanded its financial sanctions on Russia significantly on November 21, 2024, with announced measures including sanctions on Gazprombank; see announcement at https://home.treasury.gov/news/press-releases/jy2725.

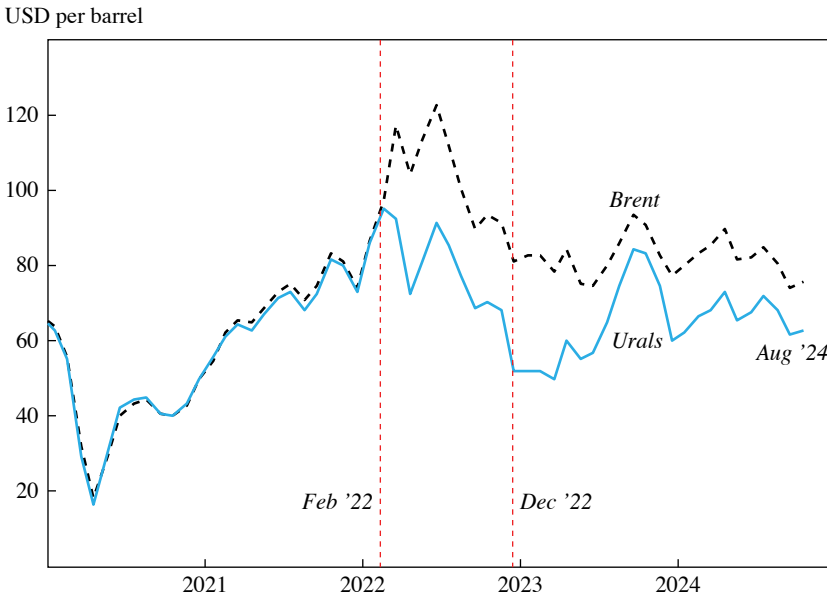
to Western companies: "You may no longer do this." When those rules are broken and the parties involved aren't punished, ex post enforcement is weak. An example of this is the surge in exports from around the world to Central Asia, which I will discuss in greater depth shortly. However, in the case of the G7 oil price cap, the more insidious and destructive damage took place ex ante in two ways.

The goal of the G7 cap was to reduce the flow of hard currency to Russia as payment for seaborne oil exports. Its ability to do this depended critically on the level of the cap, which you can think of as bounded from below by zero and bounded from above by the prevailing spot price for Urals crude. A cap of zero is the most onerous possible choice, sharply reducing Russia's revenue from oil exports. A cap set at the spot price is the least onerous because it does nothing to restrict revenues. When the G7 cap was first floated in the summer of 2022, the global Brent oil price benchmark was around $120 per barrel and Urals (the benchmark for Russian oil) was near $90. By the time the cap went into effect in December 2022, oil prices had fallen a lot, and the level of the cap that was announced ($60) was close to the market price of Urals (figure 3). In other words, on inception, the G7 cap was near the least onerous end of the spectrum for Russia. Accounts on why the cap was not set lower differ. Perhaps the United States feared a low cap might cause an oil price spike, which could hurt the economy around important midterm elections. Perhaps this was a compromise within the EU, where Poland and the Baltics are said to have wanted a low cap but had to compromise with Greece, Cyprus, and Malta, where the shipping industry exerts a lot of influence.

What is clear, regardless, is that short-term commercial interests overrode the strategic objective of weakening Russia. This ex ante error may have diminished the G7 cap's impact on Russia in two ways. First, a lower G7 cap might have signaled a high degree of resolve to Western firms, helping boost compliance with the cap. Second, and more important, a lower cap would have been a signal to other autocrats with territorial ambitions that the West is serious about imposing impactful sanctions. The opportunity to send that deterrent signal was missed.

While the $60 cap was too high, this could still have been remedied by subsequently lowering it. In short, damage from this initial misstep—while material—was not irreversible. In contrast, irreversible damage was caused by the fact that no restrictions were placed on the ability of Western ship owners to sell oil tankers to the "shadow fleet," an amorphous fleet of ships owned by shell companies under ultimate control of the Kremlin and its

Figure 3. Brent and Urals Oil Prices

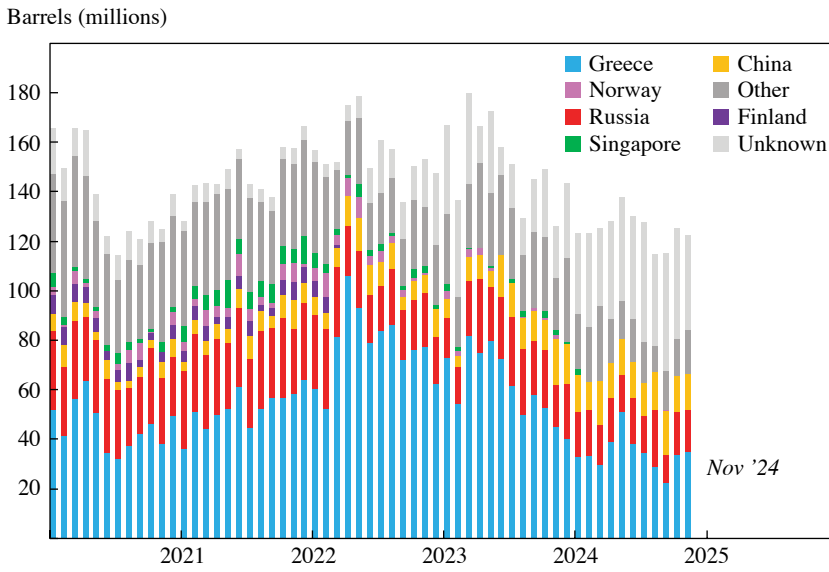


Source: Haver Analytics.

allies. Such restrictions should have been imposed with the introduction of the G7 oil price cap, but—presumably—lobbying from countries with large oil tanker fleets prevented this. The shadow fleet was thus allowed to grow unchecked.

Figure 4 shows how rapidly the shadow fleet grew and where it came from. The figure uses daily data from Bloomberg on departures of oil tankers from all Russian ports and aggregates these into monthly volumes broken down by nationality of the person or entity receiving the profit stream from operations (the beneficial owner). Since 2022, total volume of seaborne exports has been roughly stable, but there has been a large shift in composition. The importance of Greek-owned vessels has fallen and the importance of ships with unidentified owners—likely shadow fleet vessels—has grown. Western ship owners, especially Greek ones, enabled this shift, by selling their older oil tankers to the shadow fleet on attractive terms (Russia was paying top dollar because it needed tanker capacity to export outside the G7 cap). As noted above, sales of Western oil tankers to non-Western buyers should have been prohibited with the inception of the cap. Lobbying

Figure 4. Cargo Volume of Oil Tankers Departing Russia by Location of Beneficial Owner's Headquarter



Source: Bloomberg.

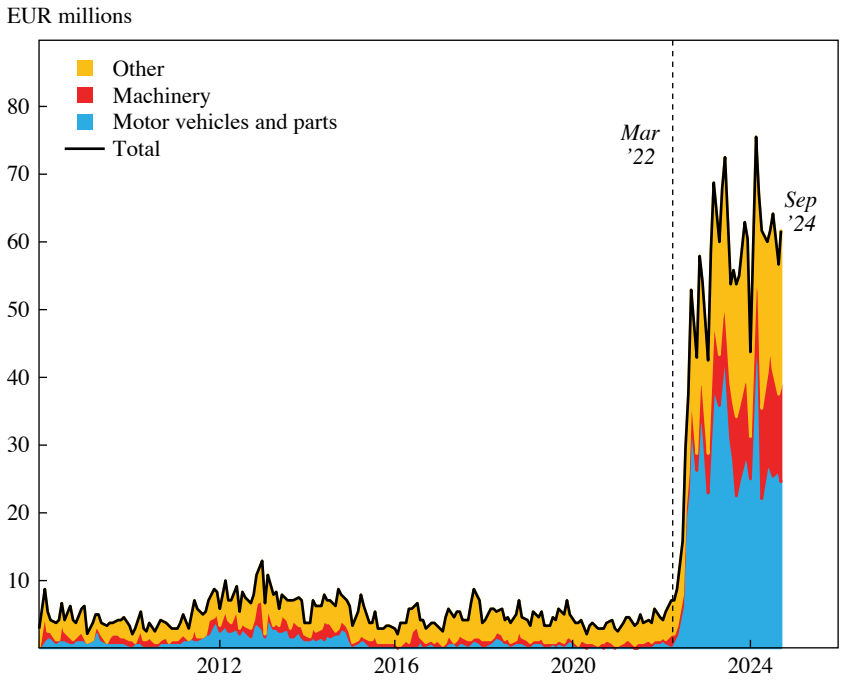
by the shipping industry prevented that. Again, as in the case of the level of the cap, short-term commercial interests overrode the strategic objective of weakening Russia.

Both examples are symptoms of the same underlying issue. In many ways, the world is coming from a period of maximum globalization. As a result, there are many companies and individuals whose economic well-being depends on unrestricted trade and commerce. These are powerful vested interests that oppose sanctions, which in the end put restrictions on such commerce.

Above all, the experience of the G7 price cap shows that these vested interests are very powerful, successfully undermining it before it even began. This is highly unfortunate because, unlike financial sanctions, the G7 cap had genuine potential to damage Russia. As we move forward, more needs to be done to insulate Western policymakers from short-term commercial interests, which may undermine medium-term economic security.

WEAK ENFORCEMENT OF WESTERN EXPORT CONTROLS The experience with the G7 cap highlights the role of ex ante lobbying in watering down sanctions

Figure 5. Germany's Monthly Exports of Goods to Kyrgyzstan



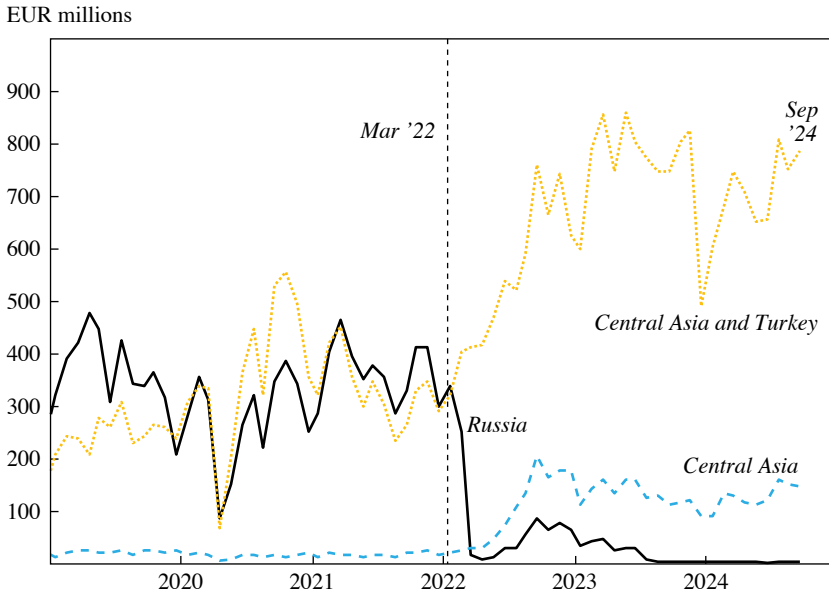
Source: Haver Analytics.

before they even take effect. Transshipment of Western goods to Russia via third countries is an example of weak ex post enforcement.

In the immediate aftermath of the invasion, the West imposed export controls on high priority items that could be used by Russia on the battlefield.[2] Around this time, exports from around the world to countries in Central Asia, the Caucasus, and Turkey started booming. Figure 5 gives the example of German exports to Kyrgyzstan, which—in the case of cars and parts—have risen 5100 percent on an annual average basis comparing 2023 (after the invasion) to 2019 (preinvasion and pre-COVID baseline). This export boom obviously has nothing to do with servicing Kyrgyz domestic demand. Kyrgyz data show only a small rise in imports from Germany,

2. Western goods subject to export controls are summarized on a Common High Priority Items List (CHPL), which can be found at US Department of Commerce, Bureau of Industry and Security, "Common High Priority List," https://media.bis.gov/licensing/country-guidance/common-high-priority-items-list-chpl.

Figure 6. German Exports of Cars and Parts to Russia, Central Asia, and Turkey

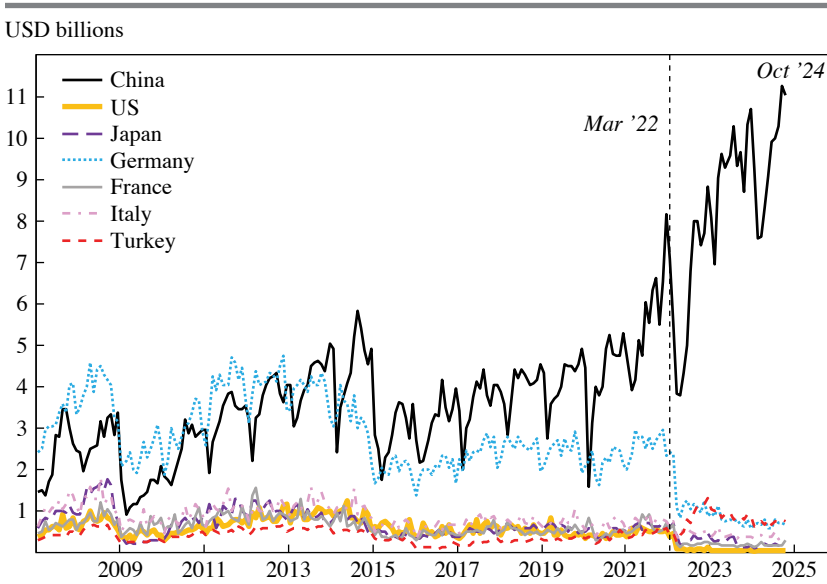


Source: Haver Analytics.
Note: Central Asia encompasses Armenia, Azerbaijan, Georgia, Kazakhstan, and Kyrgyzstan.

which suggests that Kyrgyzstan—and other countries in the region—is a placeholder that gets written on export invoices, with goods then going directly to Russia. Such transshipments are happening from across the EU (Scandinavia is an important exception) to almost every country in Central Asia, the Caucasus, and Turkey. While the goods in question may not be subject to export controls directly, things like cars and parts are clearly dual use, so this is a sanctions violation—if not in letter, then certainly in spirit. Remarkably, even though this trade is an open secret, it continues unabated more than two years after the invasion.

A key pushback to figure 5 is that the numbers involved are small. After all, even if German exports to Kyrgyzstan have risen by a lot, they did so from a small base and in absolute terms average only 60 million euros per month. However, Kyrgyzstan is just one example. Similar shipments go from Germany to almost every other country in Central Asia, the Caucasus, and Turkey. When you total all this up for German cars and parts, the rise in transshipments more than offsets the fall in direct exports to Russia (figure 6). In short, the transshipment trade is economically significant

Figure 7. Monthly Exports to Russia by Country



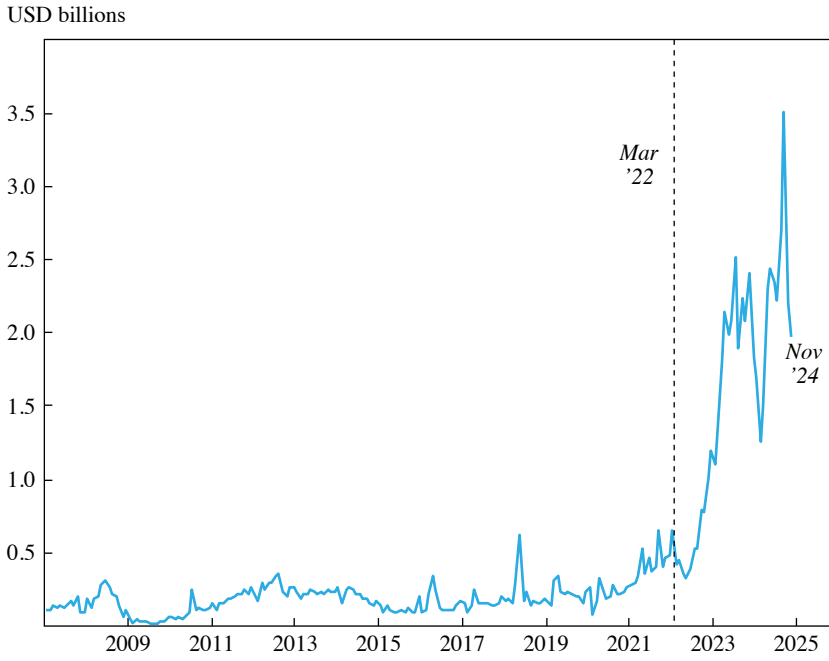
Source: Haver Analytics.

and—because it is widespread across the EU—it is large in overall size. It should be noted that similar transshipments are not happening for the United States, the United Kingdom, and Japan, which underscores that none of this is inevitable. Ongoing transshipments must be going on with implicit government approval.

On the surface, transshipments are another symptom of how powerful vested interests—in this case large exporters throughout the EU—push governments to put short-term commercial interests over medium-term security. That said, global trade in goods is highly dispersed, so that perfect enforcement of export controls may be unrealistic under the best of circumstances. This point—the dispersion of global trade—is especially important when factoring in the huge rise in China's exports to Russia (figure 7), which by itself has more than offset the fall in Western direct exports to Russia and spans important categories like transportation equipment (figure 8).

The dispersion of global trade makes export controls at best a highly imperfect tool. Ultimately, this underscores the importance of the G7 oil price cap. Russia needs purchasing power if it wants to import goods, including ones subject to export controls. It derives that purchasing power

Figure 8. Chinese Exports of Transportation Equipment to Russia



Source: Haver Analytics.
Note: Transportation equipment includes railways, cars and trucks, aircraft, and ships.

from its energy exports, of which oil exports are the single biggest component. If Russia's income stream from oil exports were to be compromised, that would also curtail its ability to import goods of all kinds. Sanctioning hostile current account surplus countries therefore starts and ends with export revenues. Imports will then take care of themselves.

LESSONS FOR THE WEST Western sanctions on Russia were therefore materially compromised both ex ante and ex post, due to lobbying from companies that are more concerned with short-term profits than with medium-term economic security. As a result, the supposed resilience of Russia's economy is really a red herring. There is no doubt in my mind that if the G7 cap were substantially lowered and the sale of Western-owned oil tankers to undisclosed interests prohibited even today, Russia would go into deep financial crisis. In other words, the better-than-expected performance of Russia's economy is above all a symptom of Western shortfalls and indecision on sanctions. If Russia is doing well, it is primarily because the West is allowing that to happen.

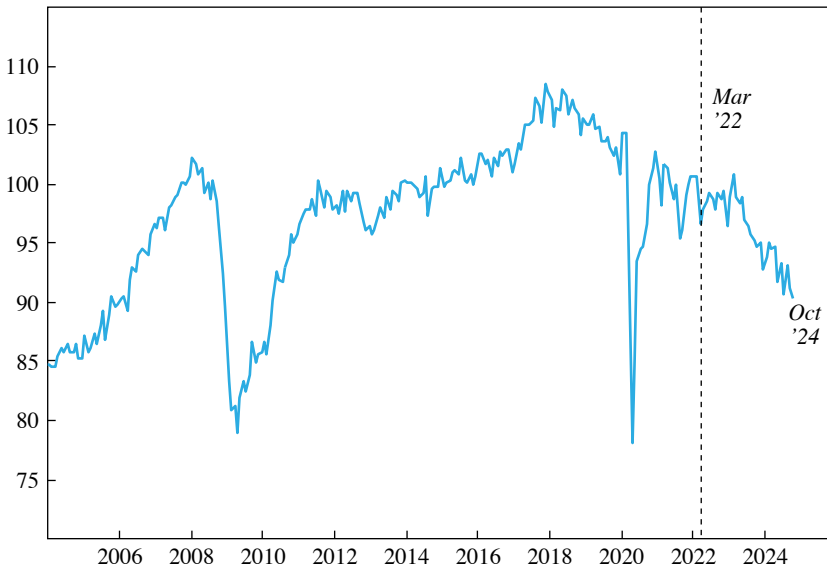
Itskhoki and Ribakova certainly acknowledge this at times, but this very fundamental point—that Western shortfalls are the principal reason for Russia's resilience—gets lost. In my view, it might be better to write an entirely Western-focused paper on Russia sanctions, since this is where implementation and enforcement issues originate. Key issues to address in such a paper would be: (1) How exactly did ex ante lobbying by commercial interests play out in 2022 and what can be done going forward to insulate policymakers from such lobbying; and (2) given that so much of the design and enforcement issues revolve around the EU—from Greek ship owners to German exporters—it is worth asking what reforms to governance and institutions are needed to inoculate the EU from what are clearly very powerful vested interests going forward.

A related point is about the counterfactual. Put yourself in the shoes of a Western government—say Germany—in the days after Russia invaded Ukraine. A loud debate was going on about whether to put a full energy embargo on Russia. On the one hand, the government was lobbied aggressively by industry that such an embargo would impose great short-term costs on the German economy, including deep recession and a sharp rise in unemployment. On the other hand, the government was also no doubt aware that failure to counter Russia aggressively could lead to even higher costs to Germany over the medium-term, perhaps via heightened geopolitical risk due to an emboldened Russia. Ultimately, the decision facing Germany's government was whether to go hard or soft on sanctions. It decided to do the latter, presumably on the grounds that—for Germany—the negatives from a full embargo outweighed the positives.

That calculus has turned out to be deeply wrong. Maybe Germany's decision to go soft on Russia prevented recession in 2022, but the German economy has been in steady and alarming decline ever since, to the point where industrial production is now down over 10 percent since the invasion, with no recovery in sight (figure 9). The trade-offs implicit in going hard versus soft on sanctions need to be better understood, especially since a full embargo could have sent Russia into deep financial crisis, which perhaps might have led to regime change that could have ended war in Ukraine. The trade-off implicit in hard versus soft is therefore a sharp but hopefully short shock versus long-drawn-out stagnation, a trade-off that can only be evaluated in a fully fledged model. Perhaps this is beyond the scope of the paper, but it will take a full model simulation to push back on the short-term policy approach that in my opinion undermined Russia sanctions.

The authors buy into the "Fortress Russia" narrative, which is that the country made important steps to wall itself off from global markets ahead

Figure 9. Germany's Industrial Production



Source: Haver Analytics.

of the invasion, so that "no condition for a financial crisis was satisfied" in the face of sanctions according to their paper. I think this misses the point that a low G7 cap would have substantially lowered the current account surplus, sparking a large depreciation of the ruble, which in turn would have pushed up inflation well beyond current levels, requiring emergency rate hikes. In short, financial conditions would have tightened sharply, which would have weighed on Russia's war machine and its ability to fight in Ukraine. The fact that Russia has historically had a current account surplus is no safeguard against the G7 cap. Indeed, the current account surplus was at the mercy of the West and its G7 oil price cap.

A related point pertains to Russia's official FX reserves. The value of the ruble is a function of daily *flow* in the balance of payments, that is, supply versus demand of US dollars. If the G7 cap had been initially set at something like $30 (instead of $60), this would have sharply cut the supply of dollars, weakening the ruble. Russia's official FX reserves—a stock—could have provided a buffer to smooth such a shock, but in the end reserves are a stock and thus finite. This *stock* versus *flow* distinction is important and, again, gets a bit lost. Russia's government was clearly aware that its stock of official reserves can only go so far, as it resorted to

capital controls to limit capital flight, in effect choosing to safeguard official reserves at the expense of convertibility. The authors therefore make too much of Russia's official reserves, in my view, and should more clearly distinguish between balance of payment flows versus stocks.

The theoretical discussion on the size of the sanctioned economy ignores the central idea behind the G7 cap: Oil exports would continue to flow to the rest of the world, just that Russia would be paid an administered price that ideally is substantially below the market price for Urals. The cap is an example of a workaround, whereby Russia's central role in global energy security was recognized and addressed within a coherent framework. That framework was undermined by commercial lobbying, but that doesn't mean size is an obstacle. Russia's role as an important energy supplier is precisely the reason the G7 cap was designed and implemented.

The authors correctly note that Russia responded to the EU embargo on its seaborne crude by rerouting exports to China, India, and Turkey. From the perspective of the G7 cap, this rerouting is perfectly fine, if transport happens on cap-compliant ships. As I have highlighted above, the problem was not the shift in Russia's customer base, but the fact that the initial level of the cap was not set low enough and that a large shadow fleet was allowed to form, courtesy of Western oil tanker owners who sold their vessels to Kremlin operatives.

The authors have done a great public service in helping shed light on sanctions since Russia's terrible invasion of Ukraine. Many of the underlying questions regarding sanctions will take time and effort to answer. There is a great degree of urgency, since faulty implementation and enforcement of Russia sanctions may only exacerbate geopolitical risk going forward, as other autocratic countries with territorial ambitions—China is at the top of the list—are likely emboldened by what they have seen, rather than being deterred. This paper is a terrific starting point for further exploration and my congratulations go to both authors.

COMMENT BY

RORY MACFARQUHAR Under what conditions are economic sanctions effective as a tool of foreign policy? And why, despite the unprecedented sanctions imposed on it by Europe and the United States after its full-scale invasion of Ukraine in February 2022, has Russia's economy remained so resilient? These highly topical questions raised by Itskhoki and Ribakova are of immediate relevance to sanctions practitioners (and former practitioners, such as myself), over and above their contribution to

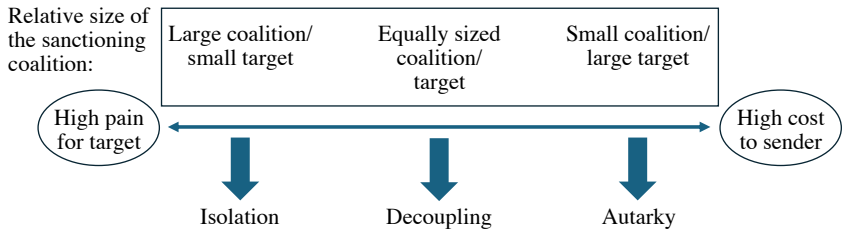
the academic literature. In this comment, I will first address the theoretical contributions of the paper and then discuss the effectiveness of the two efforts to sanction Russia, in 2014–2015 and after 2022, drawing out implications not only for the current conflict in Ukraine but also for a potential future conflict with China.

SANCTIONS IN PRACTICE AND THEORY The authors analyze three types of sanctions: trade restrictions—embargoes on exports to and imports from the target country; what they label "financial sanctions"—limits on external borrowing by the target country's government, financial institutions, and companies; and payment system sanctions that restrict the target country's ability to transact with foreign counterparties, for example, through the use of the dollar and the Society for Worldwide Interbank Financial Telecommunications (SWIFT) system.

Trade sanctions. Reassuringly, the authors' theoretical analysis of trade sanction maps directly onto many of the intuitive concepts developed over the years by sanctions practitioners. For example, it has long been understood that restrictions on exports to the target country should focus primarily on products that the country cannot easily obtain from countries not participating in the sanctions; in the terminology of sanctions, a bad outcome would be the "backfill" of suppliers from sanctioning countries with products from elsewhere, since that would potentially do more damage to the sanctioning country's economy than to the target's. A third country would gain market share at the expense of the sanctioning country's companies, with no impact on the target country's economy. As a result, sanctions have in the first instance focused on "choke point" goods that are critical to the target country's economy but not widely available on the global market other than from countries participating in the sanctions. It has similarly been understood that sanctions policy needs to bear in mind the economic sacrifice made by the sanctioning countries, what the authors label the "cost to sender." And policymakers have grasped the value of working with broad coalitions of allies and partners to increase the impact on the target and reduce the risk of backfill. Finally, the US government has for many years recognized that the effectiveness of sanctions diminishes over time as the target country develops workarounds; this has motivated what the Treasury Department refers to as the need for sanctions maintenance, regular updates to tighten restrictions and close off loopholes in order to sustain a constant level of pressure.

These long-held intuitions correspond to the theoretical insights of the paper: First, both parties to an international trade transaction enjoy welfare gains from trade, and hence trade restrictions will result in costs to

Figure 1. The Larger the Sanctions Target, the Higher the Cost to Sender



Source: Author's illustration.

the sender as well as to the target. In general, the larger the sanctioning coalition and the smaller the target, the lower the costs to sender relative to the impact on the target country. Second, a critical variable determining the welfare impact of a trade restriction is the elasticity of substitution between imports and domestic production: The more easily Russia can produce domestically the products that it can no longer import, then the smaller its welfare loss is—and similarly if it can obtain goods from foreign sources outside the sanctioning coalition, then the impact is minimal. And third, the elasticity of substitution is higher in the long run than in the short run, supporting the intuition behind sanctions maintenance.

The authors' insight into the relationship between the cost to sender and the size of the sanctioning coalition has important implications as policymakers look beyond Russia to a potential future conflict with China. The classic vision of sanctions is of a global coalition, organized under the auspices of the United Nations, mobilizing to isolate a small rogue actor. At the other extreme, one could imagine the theoretical possibility of a small country essentially cutting itself off from most or all major economies autarkically, perhaps along the lines of pre-1989 Albania. Real-world cases fall in between these archetypal ends of the spectrum. The key point is that the closer to equality the sizes of the sanctioning coalition and the target, the less sanctioning resembles isolating a rogue actor and the more it becomes decoupling from a peer trading partner—with roughly equivalent costs to the target and to the sender from the curtailment of what would otherwise be a mutually beneficial trading relationship (see figure 1).

Beyond the relative size of the sanctioning coalition and target, it also follows from this analysis that the elasticity of substitution of particular exports and imports is a crucial variable: If the sanctions target controls the supply of a critical input or production technology, then the cost to sender could turn out to be even higher than the cost endured by the target.

Hence, in advance of such conflict among peer competitors, both sides should logically try to maximize their leverage and minimize their vulnerability by positioning themselves as the sole or dominant global supplier of certain inelastically demanded inputs—say, rare earth metals or cutting-edge semiconductors—and the importer only of products that are widely available from a diverse (and ideally friendly) set of suppliers (Farrell and Newman 2019; Miller 2022).

Financial and payment system sanctions. There is more of a discrepancy between theory and practice in the authors' discussion of financial sanctions, largely due to differences in terminology. The authors characterize the aim of financial sanctions as to "curb the ability of *intertemporal* trade": to stop a country from borrowing money in order to pay for imported goods. They then point out that when, as in the case of Russia, a country does not rely on foreign borrowing and runs a trade surplus (so that current export revenues on aggregate more than cover current import payments), then the impact of these sanctions will be minimal. This is in stark contrast to the way practitioners typically think about financial sanctions, which are sometimes referred to as a "financial death sentence" for targeted individuals and companies (Boyle 2021).

In practice, US financial sanctions under the International Emergency Economic Powers Act (IEEPA) typically encompass a far broader set of restrictions than limitations on borrowing. They entail placing an individual or entity on the Specially Designated Nationals and Blocked Persons (SDN) list, which results in the freezing of all assets held at US financial institutions and the requirement that US financial institutions reject any transactions—not only borrowing but also buying and selling—involving the sanctioned individual or entity. In other words, financial sanctions in standard parlance encompass much of what the authors refer to as payment system sanctions. There have been examples of a narrow restriction on borrowing: In 2014, after Russia's annexation of Crimea, the United States limited borrowing by Russian state-owned financial institutions beyond a ninety-day maturity, with that figure later cut to thirty days and then to fourteen days, without adding them to the SDN list (OFAC 2017). But those moves were intended to serve as a threat to Russia that a more serious incursion into Ukraine would ultimately result in placing those institutions on the SDN list (which is exactly what happened after the full-scale invasion of Ukraine in February 2022).

The power of US financial sanctions—in the SDN sense of the term—is clearly linked to the centrality of the dollar and US financial institutions in international trade and finance. As Russia has demonstrated since 2022,

it is possible for a country to continue to import and export even outside the dollar-based system, but the logistics are challenging and the transactions costs are substantial, particularly when there is a mismatch between the buyers of a country's exports and the suppliers of its imports (Bloomberg 2023). Thus far, sanctions-proof alternative cross-border payment infrastructures, such as China's Cross-Border Interbank Payment System (CIPS) or Project mBridge involving central bank digital currencies, have not reached the scale they would need to pose a serious challenge to the dollar system; network effects and switching costs, as well as other well-known strengths of the US financial markets, have left the dollar in an as yet unassailable position. In the decoupling scenario described above, however, the incentives of a group of countries to pay the costs of switching en masse to one of these alternative systems would increase.

HOW EFFECTIVE HAVE SANCTIONS ON RUSSIA BEEN? Economic statecraft is the use of economic tools in pursuit of foreign policy goals. So ultimately the effectiveness of sanctions should be measured not by economic indicators but in terms of whether the policy aims were achieved. For example, sanctions aimed at regime change that succeed in impoverishing the target country but not in altering the behavior of its government should not in themselves be judged a success. Economic indicators cannot even be regarded as intervening variables, since the political economy mechanisms through which sanctions operate are poorly understood: There are circumstances in which a deterioration in the aggregate economic performance of a country could even have the opposite of the desired effect on its foreign policy.

In the two episodes of sanctions on Russia—2014–2015, in the wake of the annexation of Crimea and invasion of eastern Ukraine, and since the full-scale invasion of Ukraine in 2022—policymakers set themselves different goals and hence adopted different approaches to sanctions.

Crimea sanctions. In the earlier episode, as the authors correctly observe, the goal of the sanctions was to alter the Russian leadership's cost-benefit calculation with respect to its actions in Ukraine. The aim was deterrence: to change Russia's behavior by making it clear what further steps would be taken if it continued down the path it was following.[1] Conversely, the message was that there could be an "off-ramp" from sanctions if Russia were to end the war.

1. The public rhetoric around sanctions tended to obscure this point, since policymakers frequently referred to the sanctions as designed to impose costs on Russia for its actions, as if the purpose were retrospective punishment rather than prospective deterrence.

Since this was an effort at inducing a change in behavior, sanctions focused on the decision-makers themselves, as well as individuals and institutions proximate to them, including companies and banks that served as pillars of the regime. At the outset, Russia's leaders appeared to believe that they would pay little or no economic price for their actions, as had been the case after Russia's 2008 invasion of Georgia. Russia's economy remained deeply integrated into the global trade and financial system, and the valuations of Russia's largest companies were propped up by significant foreign holdings of their shares, so the Russian elite had a lot to lose.

By contrast, triggering a financial crisis or a severe recession that hurt the entire population was not the aim of the sanctions; indeed, the financing restrictions were explicitly designed to avoid interfering with the core plumbing of the Russian financial system. Moreover, the cost-to-sender logic constrained the actions taken: Recognizing their inelastic dependence on Russian gas, the European Union (EU) countries rejected any measures that would interfere with gas production or exports, while the United States sought to avoid any actions that threatened to drive up global oil prices.

If one were to judge them solely by their macroeconomic impact, the 2014–2015 sanctions were not particularly effective: The ruble plunged in value in late 2014 and Russia endured a brief recession in 2015, but both were as much a consequence of falling world oil prices as of the sanctions. One study estimates that the impact of the oil price shock on the Russian economy was 3.3 times as large as the impact of the sanctions (Gurvich and Prilepskiy 2015).

On the other hand, in terms of the foreign policy goals that they were intended to support, the sanctions policy appears more successful: Russia halted its advance in early 2015, and the line of control remained unchanged for the next seven years—until Russia believed that it had taken sufficient steps to insulate itself from the sanctions that it knew would result from a full-scale invasion. In other words, concern about the costs of further sanctions does seem to have served as an effective deterrent in 2015. But by 2022, Russia's leaders believed that they were prepared for what was coming and that the costs would be manageable: The deterrent effect had worn off.

2022 sanctions. After the full-scale invasion of Ukraine in February 2022, the goal for Western policymakers was no longer to induce a change in behavior by signaling threats of future sanctions, since Russia had already undertaken the actions that the earlier sanctions had been intended to deter. Deterrence had failed. Instead, the aim now was to use economic tools to impede Russia's ability to wage war, by denying it critical inputs,

degrading its overall economic potential, and impairing its ability to conduct international transactions. That proved to be a far harder task.

In their effort to degrade Russia's military capacity, Europe and the United States rapidly deployed the sanctions that had been held in reserve in 2015, going so far as to freeze the assets of the Central Bank of Russia and to eject several of the largest Russian banks from the SWIFT interbank messaging system. After the 2022 invasion, European policymakers were far more willing to endure the cost to sender of a disruption in energy imports from Russia, although some of the EU's measures were phased in to give European economies time to adjust. The EU prohibited the import of seaborne crude oil and refined products and cut imports of Russian natural gas by two-thirds (Gross and Stelzenmüller 2024)—the latter triggering a sharp spike in wholesale natural gas and electricity prices across the continent that ended up pushing the EU into recession in mid-2023. Relative to 2014–2015, Europe's pain threshold had risen by a lot.

The US government, on the other hand, was no more willing than in the earlier period to tolerate a surge in international oil prices, at a time when inflation was already high due to the disruption of supply chains by the COVID-19 pandemic. Rather than taking steps to reduce Russia's oil exports, the United States instead sought to maintain the flow of Russian oil to the global market while limiting the revenues that Russia would receive for its exports. The novel price cap mechanism leveraged the West's dominance over the shipping industry to prohibit sales of Russian oil above the price of $60 per barrel for any oil shipments involving Western ships or insurance. As the authors show, the policy appears to have been successful in its early months, but over time workarounds such as fraudulent attestations and the creation of a "shadow fleet" of ships have drastically reduced the effectiveness of the policy.

While the sanctions imposed in 2022 were considerably more severe than the 2014–2015 ones, the macroeconomic impact was, if anything, milder. Russia's economy contracted by 1.2 percent in 2022, and while the ruble initially plunged, it rapidly rebounded to a level stronger than in 2015 (see figures 1 and 6 in the paper). Inflation has accelerated—but that has been due to a labor shortage and the overheated war economy. Most disappointingly, as the authors show, Russia's imports of "battlefield goods" have recovered after an initial slump, indicating that efforts to interfere with Russia's ability to conduct international transactions were effective only temporarily.

And the sanctions were no more successful when measured against the underlying policy goal of degrading Russia's ability to wage war against

Ukraine: In fact, Russia has relentlessly pressed forward with its offensive in Ukraine, with weapons and dual-use inputs supplied either by friendly countries—Iran, North Korea, and China—or else smuggled from the West via third countries not participating in the sanctions. As of late 2024, the most significant impediment to Russia's war effort was a shortage of manpower, which is not directly connected to sanctions at all.

WHY IS RUSSIA SO HARD TO SANCTION? What then explains the limited success of the Western sanctions in this more recent conflict, whether measured by macroeconomic or foreign policy metrics?

First, in several respects Russia would always have been a hard target: It is a large economy with the ability to substitute domestic production for many imports; it exports commodities for which there is demand throughout the world, even if its lowest cost supply routes were through fixed pipelines to Europe; it has land borders with friendly countries willing to backfill sanctioned goods; and it has a legacy defense industry dating back to Soviet times. The authors' theory section convincingly demonstrates that the size of the economy, the high elasticity of substitution of imports with domestic production, and the availability of alternative suppliers and customers all point toward minimal sanctions impact.

Second, over and above its natural advantages, Russia made a concerted effort to insulate itself from the effects of financial sanctions in advance of the 2022 invasion. In the wake of the 2014–2015 sanctions episode, Russia understood that a renewed attack on Ukraine would result in more severe sanctions, with the Trump administration's maximum pressure campaign against Iran serving as a worst-case template for the kinds of sanctions it could face. As a result, the Russian authorities adopted a series of policies to harden the country's economy and financial system against the effects of future sanctions, in what can, with the benefit of hindsight, be recognized as a concerted effort to prepare for the 2022 invasion:

- Russia ran large fiscal and external surpluses, accumulating hundreds of billions of dollars of foreign assets.
- The central bank and finance ministry moved the assets of the National Wealth Fund and central bank foreign currency reserves out of dollars into other currencies and gold (Shagina 2022).
- It embarked on a program of import substitution to reduce its reliance on foreign goods, particularly in the food and pharmaceutical sectors.
- It deepened its relationship with alternative trading partners such as China, culminating in the without limits partnership announced by

Vladimir Putin and Xi Jinping on the eve of the invasion in early February 2022 (Reuters 2022a).

- It required that all domestic card payments be cleared over a central bank-controlled payment network, NSPK, rather than over foreign card rails that, after the invasion, were subjected both to official sanctions and to "self-sanctioning" as Visa and Mastercard voluntarily suspended their operations in Russia (Shagina 2022).

All of these measures proved prescient and served Russia well in the wake of the 2022 invasion. The only significant flaw in Russia's preparations was its decision to move its foreign assets out of dollars but not out of euros, apparently in the mistaken belief that Europe would not participate in financial sanctions against the Russian central bank. But strikingly, even the loss of access to the estimated $300 billion in frozen reserves has not turned out to be financially destabilizing, since Russia has managed to replenish its external assets by running large current account surpluses over the past three years.

Third, Western policymakers have not been willing to take the gloves off on sanctions. Worries about the cost to sender deprived them of a key instrument of leverage: cutting off Russia's oil export volumes. Due to fears about the economic—and political—consequences of a potential oil price spike, the United States did not want to take actions to reduce, even gradually, the number of barrels of oil that Russia was able to export to the world market.[2] Some argued that reducing Russian oil export volumes might even have the perverse effect of increasing its export revenues, if the rise in prices were to more than offset the volume decline; but it is hard to imagine prices remaining that high for any length of time, given that high prices would stimulate more oil production and lower oil demand.

The oil price cap was an effort to square the circle of keeping Russian oil on the world market while squeezing the revenue that the country received from its exports. As a result, as figure 11 in the paper shows, Russia continued to export around 8 million barrels per day, with the volume of its exports constrained by its obligations to the Organization of the Petroleum Exporting Countries (OPEC)+ cartel but not by sanctions. At that volume of exports, a price of $60 per barrel would generate almost $500 million

2. Russian deputy oil minister Alexander Novak predicted in March 2022 that oil prices could rise to over $300 per barrel (Reuters 2022b), while J.P. Morgan's (2022) commodities team calculated at the time that oil prices would rise to $185 if Russia were to reduce its exports by three million barrels per day.

per day in oil revenues alone, meaning that Russia would have little difficulty paying for its imports. To make matters worse, enforcement of the price cap has proved very difficult and, as time went on, traders have been increasingly able to sell Russian oil at prices above the cap.

So why were sanctions unable to bring an end to the invasion of Ukraine? To summarize: As theory predicts, it would always have been very difficult using sanctions alone to bring a country as large and resource-rich as Russia to its knees economically, especially without the participation of major trading partners such as China. Russia took anticipatory steps in the years leading up to the 2022 invasion to harden its macroeconomy and financial infrastructure to inoculate itself from the effects of sanctions. And when the invasion came, the costs to sender of the most severe sanctions proved to be higher than policymakers in the West were willing to pay. All three of these factors will apply to an even greater degree in any future conflict with a peer competitor like China.

REFERENCES FOR THE MACFARQUHAR COMMENT

Bloomberg. 2023. "Russia Says It Has Billions of Indian Rupees That It Can't Use." May 5. https://www.bloomberg.com/news/articles/2023-05-05/russia-says-it-has-billions-of-indian-rupees-that-it-can-t-use.

Boyle, Andrew. 2021. *Checking the President's Sanctions Powers*. New York: Brennan Center for Justice. https://www.brennancenter.org/our-work/policy-solutions/checking-presidents-sanctions-powers.

Farrell, Henry, and Abraham L. Newman. 2019. "Weaponized Interdependence: How Global Economic Networks Shape State Coercion." *International Security* 44, no. 1: 42–79.

Gontmakher, Evgeny. 2021. "Russia's Import Substitution: Effects and Consequences." Geopolitical Intelligence Services, December 2. https://www.gisreportsonline.com/r/import-substitution/.

Gross, Samantha, and Constanze Stelzenmüller. 2024. "Europe's Messy Russian Gas Divorce: More than Two Years After Putin's Invasion of Ukraine, Reliance on Russia for Energy Lingers." The Brookings Institution, June 18. https://www.brookings.edu/articles/europes-messy-russian-gas-divorce/.

Gurvich, Evsey, and Ilya Prilepskiy. 2015. "The Impact of Financial Sanctions on the Russian Economy." *Russian Journal of Economics* 1, no. 4: 359–85.

J.P. Morgan. 2022. *Oil Weekly*. March 2.

Miller, Chris. 2022. *Chip War: The Fight for the World's Most Critical Technology*. New York: Scribner.

Office of Foreign Assets Control (OFAC). 2017. "Ukraine-/Russia-Related Sanctions: 370. What Do the Prohibitions in Directives 1 and 2 Mean? Are They Blocking Actions?" US Department of the Treasury, November 28. https://ofac.treasury.gov/faqs/topic/1576.

Reuters. 2022a. "Moscow-Beijing Partnership Has 'No Limits'." February 4. https://www.reuters.com/world/china/moscow-beijing-partnership-has-no-limits-2022-02-04/.

Reuters. 2022b. "Novak Says Oil May Hit $300 a Barrel If Russian Crude Shunned." March 21. https://www.reuters.com/business/energy/novak-says-oil-may-hit-300-barrel-if-russian-crude-shunned-tass-reports-2022-03-21/.

Shagina, Maria. 2022. "Western Financial Warfare and Russia's De-Dollarization Strategy." Briefing Paper 339. Helsinki: Finnish Institute of International Affairs.

GENERAL DISCUSSION Ben Harris emphasized the importance of the authors' contribution, noting that having a framework for sanctions is crucial given the chaotic and stressful times under which they are often constructed. Janice Eberly agreed, pointing to the importance of generalizability that allows for analysis of other episodes through a common lens. Eberly asked if the authors had considered the extent to which trade policy aimed at trade restrictions, such as tariffs, could be analyzed within their framework given the similarities with sanctions.

Harris suggested that sanctions are a repeated game in a dynamic environment, meaning the goal is not simply to deter in the current period but in future periods as well. In addition, sanctions work as a signal, he said, noting that silence can be deafening. He ventured that the rate at which private sector companies exited Russia during the invasion of Ukraine was at least partly due to the signal that the sanctions sent. Harris further highlighted the role of frictions created by sanctions, using as an example the extra cost incurred by Russia when shipping routes changed overnight; while there may not have been an impact on volume, there was an impact on profits. Harris then turned his attention to coalition dynamics, expressing how difficult it is to get a large number of countries to reach consensus. He specifically mentioned Greece and its reliance on shipping as an important hurdle—which was ultimately overcome—in implementing the price cap on Russian oil.

Thinking about the costs, Elina Ribakova stressed the importance of better understanding the effect of different approaches. For example, Kilian, Rapson, and Schipper (2024) show the effect of a price cap can be quite different from that of an embargo, she said, which underscores the need for more research in this area.[1]

1. Lutz Kilian, David Rapson, and Burkhard C. Schipper, "The Impact of the 2022 Oil Embargo and Price Cap on Russian Oil Prices," working paper 2401 (Dallas, Tex.: Federal Reserve Bank of Dallas, 2024).

On the idea that sanctions are a repeated game, Joe Beaulieu was skeptical. He commented that the United States should be careful about introducing sanction regimes due to the risk of losing the exorbitant privilege and countries like China may be working tirelessly to prevent sanctions from being effective. Moreover, he noted, in Europe there seemed to be very little foresight on these types of issues, and multinationals similarly seem to display very little foresight when making investment decisions. He was curious to hear what participants thought about the relevance of game theory in thinking about sanctions.

Jason Furman recalled how, in 2014, lobbying from big companies related to the design of the sanctions was very intense, especially given the relatively modest impact it would have on them. He was further struck by how incredibly difficult it seems to predict the impact of the sanctions, having spoken to several experts at the time and received very different answers. The absence of a framework, Furman noted, makes these predictions nearly impossible. He then suggested an avenue for future research on the long-run consequences of sanctions, pointing to how nations may respond by building alternative payment systems and sources of reserves or changing their trade routes.

Randall Kroszner asked about how sanction regimes should be set up—how we may want to prepare now for something that may happen ten years down the line—specifically in terms of trade issues, but also on the financial side of sanctions. He pointed to the importance of considering the substitution issue further, as it relates to not only the target country but also the US dependence on countries that could be a future target for sanctions. Kroszner suggested this could drive investment decisions and such foresight is good supply chain management.

Pondering the issue of substitution, Eberly was reminded of the results from a *BPEA* paper by Benjamin Moll, Moritz Schularick, and Georg Zachmann on the effective end of German import of Russian natural gas in 2022.[2] The authors showed that the anticipated substitution effect was quite different from the ex post result, with a German economy that proved very resilient to the cutoff of Russian gas. She cautioned that the ex ante fear and uncertainty about implementing sanctions or other barriers to trade do not always line up with the outcome.

2. Benjamin Moll, Moritz Schularick, and Georg Zachmann, "The Power of Substitution: The Great German Gas Debate in Retrospect," *Brookings Papers on Economic Activity* (Fall 2023): 395–455.

Ethan Ilzetzki explained that underlying the theory of sanctions is a trade theory of peace. Trade is the "carrot" that deters countries from going to war, and its removal would effectively be the penalty. Thus, he observed, a decoupling of supply chains from certain countries to make us less dependent on them would also effectively take away the possibility of such a penalty. Such a trade-off should be carefully considered.

Ilzetzki then highlighted the issue of distributional consequences of sanctions. He pointed to research by Dzhamilya Nigmatulina that suggests that the 2014 sanctions harmed the average Russian but did little to harm the oligarchs.[3] Consequently, we must make sure not just that there is a decrease in the flow of goods, but that sanctions successfully target decision-makers, he argued.

Frederic Mishkin suggested that what matters is not how much harm one does to the target's economy but rather the extent to which sanctions successfully change behavior. He worried that sanctions were sometimes used instead of doing what he called "the tough thing": providing direct military support.

Joseph Gagnon was curious to hear thoughts on the importance of the dollar in enforcing sanctions. While some argue it would be very costly to evade the dollar, Gagnon expressed skepticism and asked if there were any analyses or numbers that could better quantify what these costs would be. Gagnon instead suggested that what might be more important is the relative size of the sanctioning coalition and those being sanctioned.

Costas Arkolakis inquired about two types of sanctions, both relating to economies of scale and capacity. The first was self-sanctioning. Arkolakis worried that, in the wake of self-sanctioning, high-quality capital was left behind by exiting firms and acquired at a huge discount by Russian firms, essentially equating a transfer of wealth. The second was sanctions on high-tech goods. While this type of goods has lower elasticity of substitution, they are high-capacity goods. Could this type of sanction inadvertently prompt Russian firms to increase their own scale and capacity to produce such goods?

Abigail Wozniak wondered what the challenges may be to the authors' proposed framework if faced with a multiplicity of so-called bad actors—would such additional complexity substantially alter the framework or actual practices?

3. Dzhamilya Nigmatulina, "Sanctions and Misallocation. How Sanctioned Firms Won and Russia Lost," discussion paper 1886 (London: Centre for Economic Performance, 2023).

Neil Mehrotra asked if the authors believed that a full trade embargo at the start of the war would have either stopped the war or led to a regime change in Russia.

Harris highlighted that an inherent challenge in evaluating the success of sanctions is the absence of a counterfactual—what would have happened had there been no sanctions? He argued that the official statistics do not capture the full impact of sanctions, suggesting that the standard of living for Russians was affected in several important ways. Harris also said that while the elasticity of substitution is part of the equation, so is the elasticity of demand, talking specifically about oil prices. When imposing an embargo, policymakers need to look not only at the political side of the issue, but also at the impact on the broader macroeconomy. Had oil prices spiked as much as some analyses suggested in the wake of an embargo, the global economy would have fallen into a recession overnight.

Oleg Itskhoki touched on the issue of how economists think about sanctions as limiting intertemporal trade, acknowledging the limitations of this approach. The issue of agents not being able to use spot currency to buy goods, as highlighted by discussant Rory MacFarquhar, is not typically part of the model. But this, Itskhoki noted, is why discussions between academics and policymakers are so important. He continued, saying that in this case, substitution was relatively easier in the real sector (e.g., finding a company to ship your goods) than it was to find an intermediary in the financial market. However, he cautioned, external validity is not guaranteed—will this be the case in future episodes as well? Countries are likely to adapt in expectation of future episodes, adding to the complex nature of sanctions.

On the optimal policy mix, Itskhoki pointed to the findings in the paper, which show that deviating from the equilibrium is very costly and requires severely restraining the export sector as well as engaging in targeted import sanctions. The other alternative, maintaining the equilibrium, becomes a cost-benefit analysis; if an oil embargo is thought to be too costly, other options to consider include, for example, expanding the military budget relative to the target country.

Ribakova explained that there can be a discrepancy between an optimally designed policy and the possibility of implementing it on the ground in the target country. This needs to be considered when evaluating what type of sanction to move forward with—feasibility is key to success. If financial sanctions are able to control critical nodes but trade sanctions less so, that will factor into the choice, she contended. Institutional capacity is a crucial issue that underpins any successful attempt at sanctioning, and with the

financial sector being more heavily regulated, this plays into the feasibility issue as well.

Ribakova emphasized that the paper is a first pass at incorporating sanctions into the field of economics, noting that they focus on the transmission mechanisms of sanctions in the paper. The fact is, she highlighted, that we have a relatively poor grasp of the extent to which sanctions transmit to the interbank market—if at all—so asking, for example, how it affects foreign policy is premature at this stage of the modeling exercise.