

Working Around Sanctions. What Cost to Russia?

Charlotte Emlinger & Kevin Lefebvre

Summary

While exports from sanctioning countries to Russia declined significantly after February 2022, a third of sanctioned products and two thirds of strategic products have been fully compensated by non-sanctioning countries.

However, this trade diversion comes at a cost: Between the first and second quarter of 2022, the price index of Russian imports jumped by 15.7%, breaking a long period of moderate growth.

The overall increase in Russia's import prices is not related to Russian imports switching to more expensive exporters. On the contrary, after 2022, Russia began importing from new origins that are cheaper, suggesting that these new suppliers were offering lower-quality products.

The surge in Russian import prices is primarily attributed to suppliers who had been exporting to Russia prior to 2022. This increase is more pronounced for non-sanctioning origins (+22%) compared to other sources and is especially notable for strategic products (+122%).

Part of this increase is explained by a rise in transport and insurance costs for Russian imports (3%). Companies supplying the Russian market have also increased their prices, net of freight costs (FOB – free on board) by an average of 9%.

Finally, the circumvention of sanctions does not explain the observed overall increase in Russian import prices. This suggests that the rise in Russian import prices is mainly the result of exporters increasing their margins when exporting to Russia.



■ Introduction

Western processors, memory cards and amplifiers used in drones and cruise missiles have been making their way to Russia, according to anecdotal evidence.¹ This suggests that Russia has been able to circumvent Western trade sanctions, and continues to source goods from abroad, including sensitive items used on the battlefield. The Russian economy's ability to adapt, reorganize supplies, and leverage its global network is surely a source of frustration for Western administrations – but wrongly so.

trade diversion comes at a cost

With the exception of a few particularly sensitive products, essential to the war industry, trade sanctions cannot reasonably be aimed at preventing the targeted country from importing, particularly when these restrictions are imposed by only a subset of countries.² In a globalized economy, there are just too many opportunities for trade diversion.³ Yet, trade diversion comes at a cost: having to give up on the preferred supplier and switch to another, less competitive one. Europeans have experienced this: Cut off from Russian gas supplies, they did not suffer any shortages, but this came at the cost of higher prices.

This policy brief focuses on the impact of export restrictions on Russian imports. It specifically examines how trade flows have been diverted from sanctioning countries to non-sanctioning countries, and assesses the costs of this diversion for Russia.

Findings point to a 12% rise in the price of Russian imports after the launch of the 2022 invasion and the intensification of sanctions. This trend can be partly attributed to higher transport and insurance costs for international transactions, but above all to higher margins for suppliers in non-sanctioning countries.

■ 1. The diversion of Russian imports

Beginning in 2022, restrictions were imposed on 2,067 out of 4,646 products exported to Russia.⁴ These restrictions cover consumer goods (e.g. perfumes and cigars), intermediate products (e.g. aviation lubricants), advanced equipment (e.g.

(1) See "US warns Turkey of 'consequences' over military-linked exports to Russia", *Financial Times*, August 7, 2024, and "US says China is supplying missile and drone engines to Russia", *Financial Times*, April 12, 2024.

(2) See the example of EU import restrictions on Russian oil: "EU urged to crack down on imports of Indian fuels made with Russian oil", *Financial Times*, May 16, 2023.

(3) Trade diversion occurs when a change in trade cost leads an importing country to switch suppliers. Circumvention is a specific kind of diversion following the enforcement of trade sanctions. A sanctioned product then reaches the sanctioned country via a non-sanctioning intermediary country.

(4) The list of sanctioned products comes from the EU Official Journal. It contains all sanctioned products up to the 13th package of sanctions. Here we define products as HS-6 rev. 2022. Source: Global Trade Tracker.

night vision and thermal imaging equipment) and raw materials (e.g. wood, glass, potassium chloride, mineral and chemical fertilizers). More than 20% of the sanctioned products are dual-use items with both civilian and military applications, such as helicopters and radio communications equipment.

While total Russian imports were on an upward trend before February 2022, they fell sharply after the beginning of the war and the imposition of international sanctions. This decline in trade was particularly evident in the case of sanctioning countries, while imports from non-sanctioning countries increased over the same period (Figure 1.a). This result is consistent with the expected effect of sanctions: Following export restrictions, sanctioning countries reduced their exports to Russia (*i.e.* trade destruction effect), while other (non-sanctioning) suppliers took over (*i.e.* trade diversion effect). Despite this diversion, however, total trade with Russia remains depressed relative to its pre-war level. This could be attributed not only to export restrictions but also to other sanctions, particularly financial ones, or the inherent challenges to trade with a country at war.

Beyond the divide between origin countries, the bottom panel of Figure 1 shows that trade in products subject to export restrictions increases after February 2022, while trade in other products declines. This suggests that the demand for targeted products increased after the war began, which is not surprising, given that these products are particularly useful in wartime. It is also noteworthy that imports of these specific products spiked just before the sudden

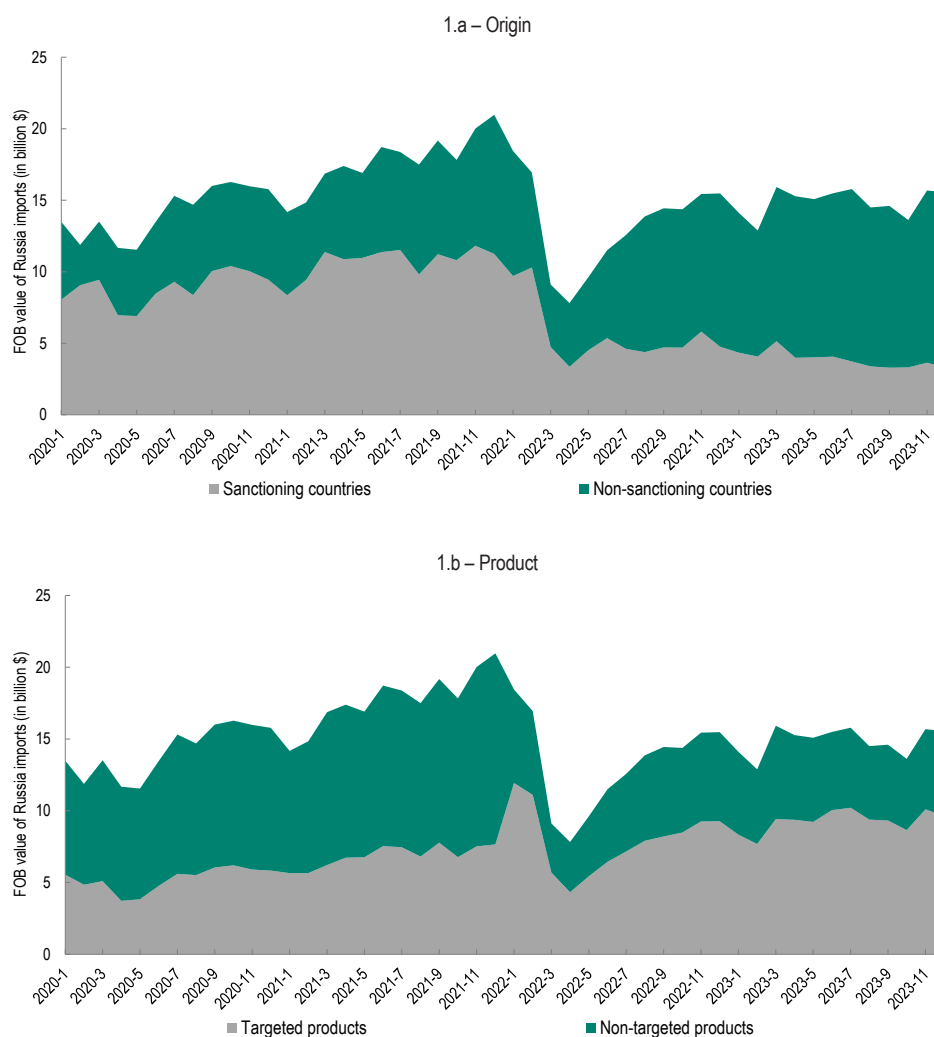
intensification of the conflict, showing that Russia had prepared for the attack. Overall, the increase in imports of targeted goods indicates that trade diversion is more pronounced for these products, and that export restrictions by sanctioning countries have not prevented Russia from sourcing these goods.

Russian imports of targeted products have shifted greatly since February 2022 (Figure 2). While the EU accounted for 76% of Russian import value in 2021, it represents only 17% in 2023.⁵ Conversely, China has become the main supplier of these products, with more than 63% of imports value compared to 25% in 2021. Although they account for only a small share of Russian imports, flows from some origins such as Turkey and Armenia have much increased over the period (respectively +224% and 1012%).

At the aggregate level, Russia continued to import (and even increased its imports of) sanctioned products (Figure 2), now mainly from China and other non-sanctioning countries. At the granular level, the question is to what extent imports from these

(5) There are several reasons why EU exports to Russia have not fallen to zero. See [Emlinger and Lefebvre \(2023\)](#) for details.

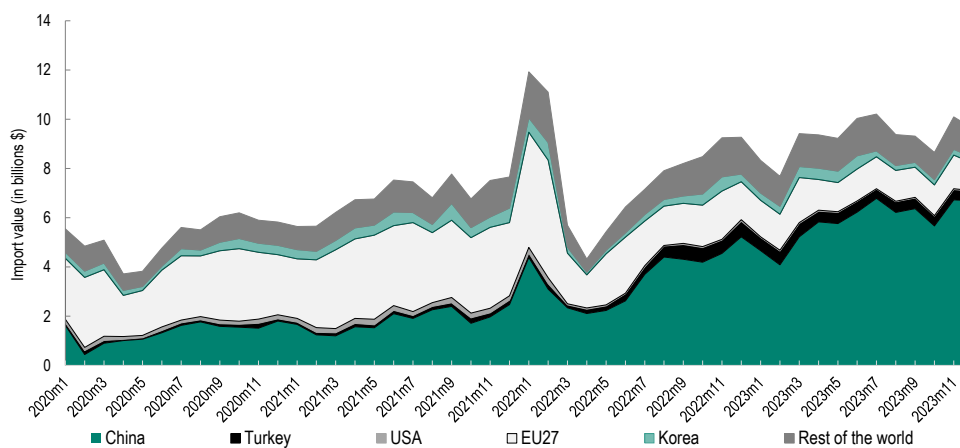
Figure 1 – Evolution of Russian imports by origin and product



Source: Authors' computation from Global Trade Tracker and the EU Official Journal (see Box 1).

Note: The list of targeted products is fixed and does not vary over time.

Figure 2 – Evolution of Russian imports of targeted products, by origin



Source: Authors' computation from Global Trade Tracker and the EU Official Journal.

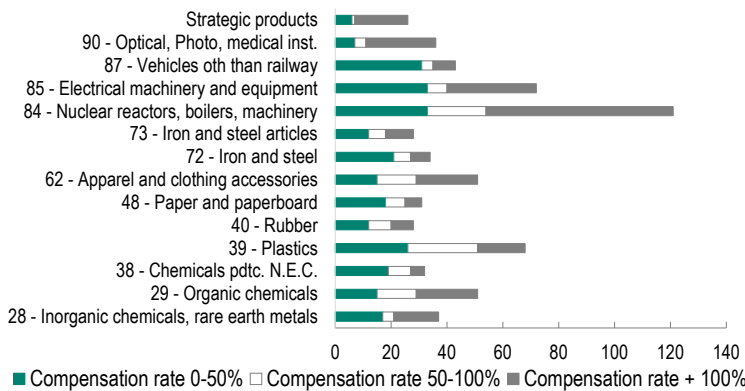
Note: The list of targeted products is fixed and does not vary over time.

new suppliers have compensated for the decline in imports from sanctioning countries for different products. We address this issue by comparing the changes in Russian imports from sanctioning and non-sanctioning countries between 2021 and 2023 at the detailed level of the product classification. We calculate a compensation rate for each of the 4,646 product categories of the Harmonized System and consider that compensation occurs when import volumes from non-sanctioning countries increase and import volumes from sanctioning countries decrease by at least 20% at the same time. A compensation rate of 100% means that the decline in imports from sanctioning countries has been fully compensated by imports from non-sanctioning countries.

37% of sanctioned products are fully compensated

An important share of products has a compensation rate equal to or above 100% (Figure 3), especially in sectors such as HS chapters 84 (boilers, machinery and nuclear reactors) and 90 (optical instruments). The majority of strategic products display very high compensation rates, suggesting that imports from non-sanctioning countries far exceeded the loss of imports from sanctioning countries.⁶ Indeed, 37% of sanctioned products (33% of non-sanctioned products) are fully compensated, while this proportion rises to 73% for strategic products.

Figure 3 – Compensation rates by sector



Source: Authors' computation from Global Trade Tracker.

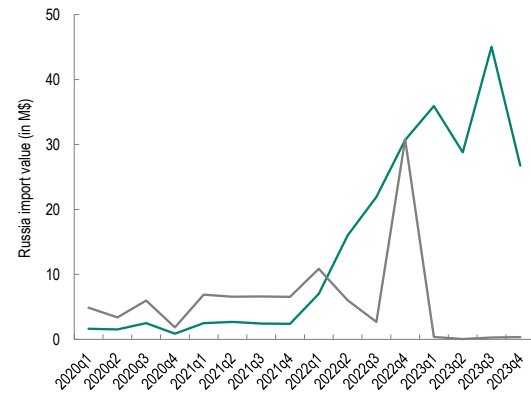
Reading note: In the HS chapter 84 containing nuclear reactors, boilers and machinery, out of 121 HS products imported by Russia: 67 products have a compensation rate above 100% (meaning the decline in imports from sanctioning countries has been more than compensated by non-sanctioning countries), 16 have a compensation rate between 50 and 100%, and 38 have a compensation rate below 50%.

For example, Figure 4 shows the case of two specific strategic products: radio navigational aid apparatus and tapered roller bearings. Before the outbreak of the high-intensity conflict, Russia was mainly supplied by sanctioning countries, but trade links have largely shifted in favor of non-sanctioning countries, and the total imports have increased.

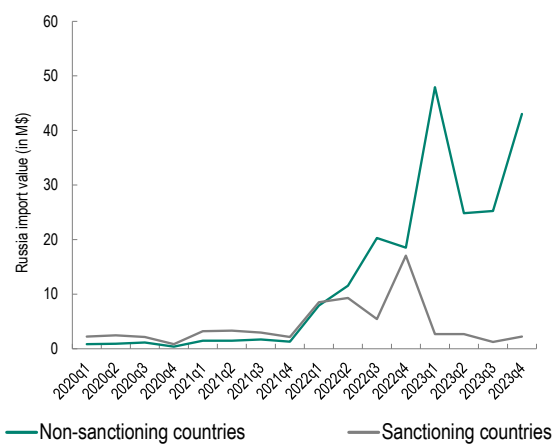
(6) Strategic products are defined as HS-6 digit product codes extracted from the list of common high-priority items published by the European Commission on February 22, 2024. It lists prohibited dual-use goods and advanced technology items used in Russian military systems found on the battlefield in Ukraine or critical to the development, production or use of those systems.

Figure 4 – Example of products with high compensation rates

4.a – Russia imports of radio navigational aid apparatus (HS 852691)



4.b – Russia imports of tapered roller bearings (HS 848220)



Source: Authors' computation from Global Trade Tracker.

2. Imports have become more expensive for Russia since the war began

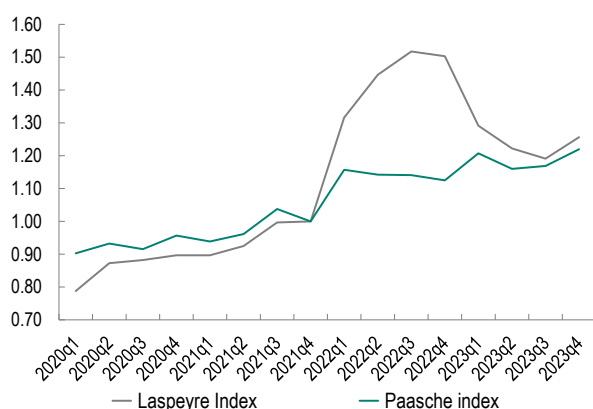
Export restrictions have not prevented Russia from purchasing strategic products. On the contrary, given the growing demand for these products, fueled by the war economy, the country has actually increased the dollar value of its imports either by increasing the volumes of imports or their price, or both. This trade diversion questions the effectiveness of Western sanctions. However, as noted in the introduction, the aim of sanctions is not necessarily to prevent the supply of goods, but to make them more difficult and therefore more expensive to obtain. While

the cost of sanctions does not lie in the reduction of imports, but in the higher prices of imports

Russia continues to have access to these products, the cost of sanctions does not lie in the reduction of imports, but in the higher prices of imports. Trade sanctions can also prevent the supply of high-quality products to Russia.

Figure 5 shows two versions of the Russian import price index based on trade unit values. Both show an increase in Russian import prices. The Paasche index (green line) reflects the current average price of Russian imports. Between the first and second quarters of 2022, it jumped 15.7%, breaking a long period of moderate growth.

Figure 5 – Price index of Russian Imports



Source: Authors' computation from Global Trade Tracker.

Four factors could explain the rise in Russian import prices:

- Due to trade diversion, Russia may have begun to import from origins that are more expensive.
- Both the escalation of the armed conflict and the sanctions (especially financial sanctions) may have increased the cost of shipping and insuring goods to Russia, affecting the prices paid by importers.
- In the wake of the sanctions, non-sanctioning countries may have begun sourcing products from sanctioned countries for re-export to Russia. This circumvention of sanctions is not cost-free. It incurs additional transport and intermediation costs.
- By forcing Westerners out of the Russian market, sanctions have reduced competition and allowed non-sanctioned suppliers to increase their margins.

We investigate each factor in turn below.

2.1. Russia imports now from cheaper origins

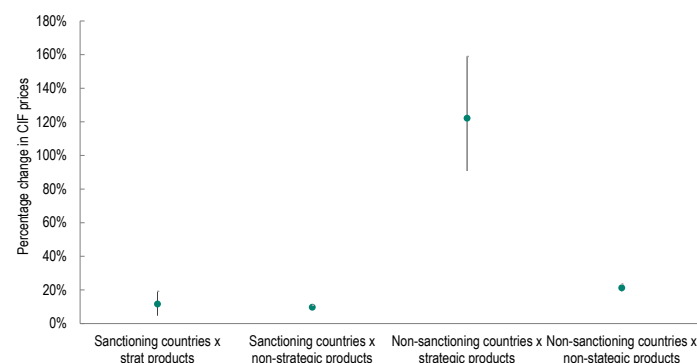
To investigate whether trade diversion explains the overall price increase of Russian imports, Figure 6 compares Paasche and Laspeyre price indexes. The Laspeyre index shows what would have been the evolution of import prices if Russia had kept the same structure of imports (same origin, same products) as before February 2022. The increase generated by the intensification of the war is much more striking than that in the Paasche index (which reflects the current average price of Russian imports). The Laspeyre jumped by more than 50% during 2022, before settling at +20% compared to the end of 2021.

A comparison of the two price indices suggests that, if Russia had maintained the same import structure, the increase in prices would have been much larger than the one that was actually observed, as reflected in the Paasche index. This means that the overall increase in Russia's import prices is not due to a switch by Russia to more expensive exporters.

This is hardly surprising, given that the sanctioning countries are mainly developed countries, while the diversion countries are emerging ones that mostly export relatively cheaper products. To confirm this finding, we perform an econometric estimation comparing price levels by origin, before sanctions (in 2021), for each product. The estimates (Table A in Appendix) show that, before the 2022 invasion, imports from sanctioning countries were on average 78% more expensive than those from non-sanctioning countries.⁷ Thus, a switch from sanctioning to non-sanctioning countries as sources of imports cannot explain the overall increase in Russian import prices. On the contrary, after 2022, Russia began importing from new and cheaper origins. This suggests that these new suppliers were offering lower-quality products.

after 2022, Russia began importing from new and cheaper origins offering lower-quality products

Figure 6 – Impact of sanctions on Russian import prices (CIF)



Source: Authors' estimates.

Note: See details in Table B in Appendix.

2.2. Imports from non-sanctioning countries are more expensive since February 2022

If trade diversion from sanctioning to non-sanctioning origins does not explain the rise in Russia's overall import prices, it means that the price of each good and origin must have increased after February 2022. We test this assumption econometrically by comparing import unit values for a given product and origin across destinations, before and after the war (Figure 6, Appendix Table B). Our results show that

(7) The price difference is computed using coefficients from Table A using the following formula: $\exp(0.58) - 1$.

Russian import prices have increased by 13% on average since the beginning of the war. This increase was higher for non-sanctioning origin (+22%) than for other origins. We do not observe a difference between sanctioned and non-sanctioned products, but the increase in unit values was particularly striking for the list of strategic products (+122%).

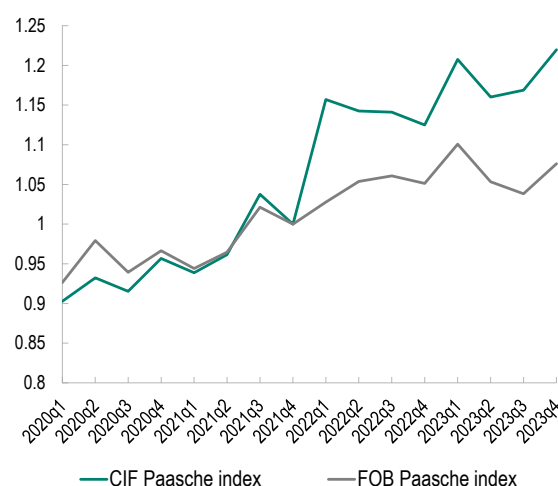
2.3. Higher cost of transportation and insurance

A measure of the cost of transport and insurance for Russian imports is obtained by comparing, for the same flow, the import declaration recorded by Russian customs with the export declaration of the partner. The latter reports FOB (free on board) values, which include neither transport nor insurance, while the former are CIF (cost insurance and freight) values, actually paid by the importer at the border crossing. Figure 7 compares the CIF and FOB Paasche price index of Russian imports. The FOB index increased less than the CIF index after the war began. The difference between the two indexes becomes larger after February 2022, suggesting that the war made transportation harder and more expensive, and increased the costs of insurance.

Several factors explain this increase in transportation and insurance costs. First, the trade diversion may have led Russia to import from more distant origins, leading to a composition bias. Second, the war may have made travel longer and more expensive by reducing the number of carriers or limiting access to certain areas, such as the Black Sea. Finally, insurance companies may have increased their costs for Russia due to the uncertainties associated with the war and the financial sanctions. It is difficult to distinguish the role of each of these factors, but we can eliminate the composition bias by estimating econometrically how the CIF/FOB ratio evolved after the war, for a given product and given origin. The results, presented in Table C in the Appendix, show that transport and insurance costs have increased by an average of 3%. If a composition bias cannot be excluded, this result suggests that transportation and insurance costs for Russian imports have actually increased for each origin and product. The increase in the CIF/FOB ratio is found to be heterogeneous across products and origins (Figure 8). The cost of transportation and insurance has particularly increased for strategic goods exported by non-sanctioning countries (+53%).

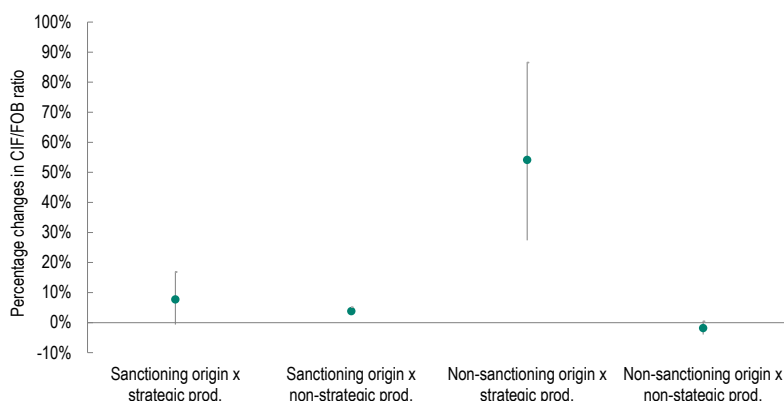
transport and insurance costs have increased by an average of 3%

Figure 7 – Comparison of CIF and FOB price Index



Source: Authors' computation from Global Trade Tracker.

Figure 8 – Impact of sanctions on transport cost (CIF/FOB ratio)



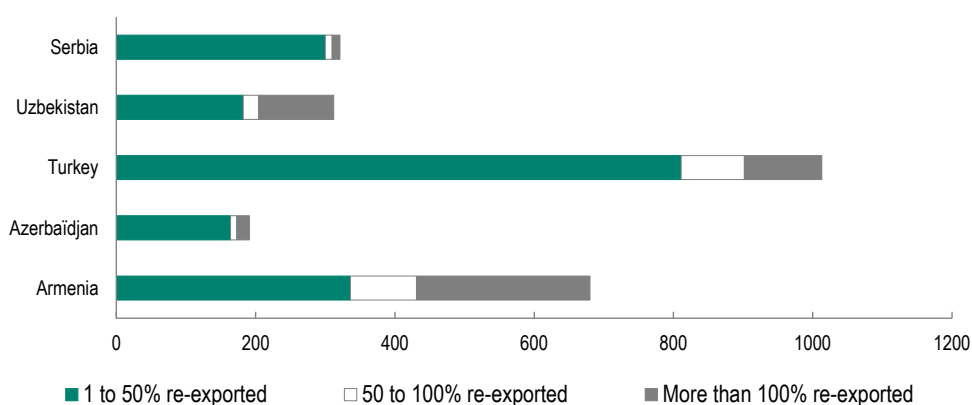
Source: Authors' estimates.

Note: See details in Table C in Appendix.

2.4. Re-exportation of imports from sanctioning countries

The increase in Russian import prices, as we have seen, averaged 13% overall. The 3% rise in transport and insurance costs explains part of this increase. Clearly, companies supplying the Russian market have also increased their prices, net of freight costs (FOB). This is supported by econometric evidence (see Table D in Appendix): FOB prices for Russian imports rose by an average of 9%, with larger increases for imports from countries not subject to sanctions and for strategic products. There are two possible explanations for these FOB price increases: a propensity for diversion countries to re-export (relatively expensive) products originating from sanctioning countries, and an increase in exporters' profit margins. It is difficult to assess these mechanisms precisely; however, we provide here and in the following section a number of indications.

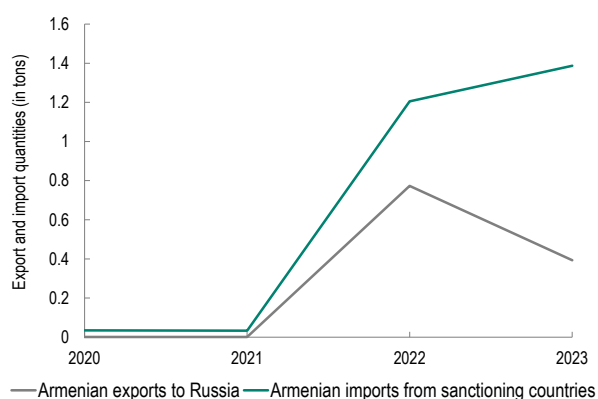
Figure 9 – Number of products with high levels of re-exportation, by country



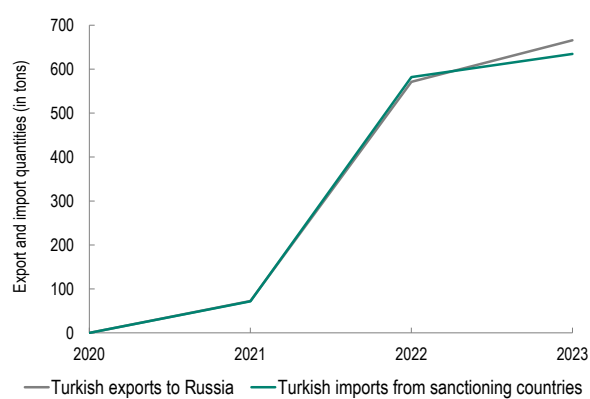
Source: Authors' computation from Global Trade Tracker.

Figure 10 – Examples of products with re-exportation

10.a – Armenian re-exports of radio navigational aid apparatus (HS 852691)



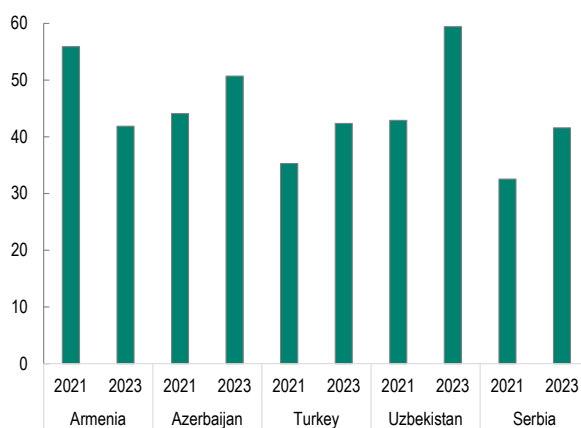
10.b – Turkish re-exports of molds for rubber or plastics (HS 848079)



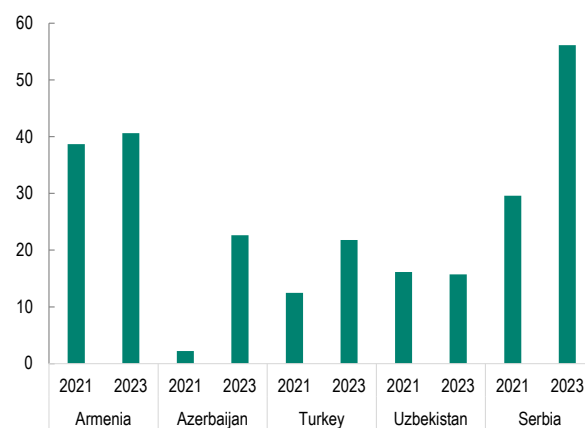
Source: Authors' computation from Global Trade Tracker.

Figure 11 – Share of high-range products in total imports and exports to Russia

11.a – Import of high range products from sanctioning countries



11.b – Export of high range products to Russia



Source: Authors' computation from Global Trade Tracker.

The export of high-priced imports from sanctioned countries to Russia by non-sanctioning countries could partly explain the observed increase in the FOB prices of Russian imports. To determine whether re-exports have played a role, we compute re-exportation indicators by origin and product. Those compare the variations of the quantities imported by a given country from sanctioning countries with the variation of exports of the same product from that country to Russia. The re-exportation rate is the share of the increased imports from sanctioning countries

no clear evidence that the rise in FOB export prices to Russia is related to re-export by connecting countries

redirected toward Russia. Figure 9 shows the number of products for each range of re-exportation rates for the main connecting countries (Armenia, Azerbaijan, Serbia, Turkey, Uzbekistan). Here, we consider only product from origins where imports from sanctioning countries increased, and exports

to Russia increased. Some countries, such as Uzbekistan and Armenia, have a significant number of products with a high level of re-export. For some specific strategic products and countries, we observe clear re-export patterns with a similar evolution of import volumes from non-sanctioning countries and exports to Russia (Figure 10).

To see whether these re-exports have affected trade prices to Russia, we compare the share of high-range products in each country's imports from sanctioning countries (Figure 11.a) and their exports to Russia in 2021 and 2023 (Figure 11.b).⁸ The right panel of the figure indicates that the share of expensive products (compared to the world average) in exports to Russia has increased in several cases, notably for Serbia. In 2021, less than 30% of Serbian exports to Russia were categorized among high-range products. This share almost doubled in 2023. However, it does not seem that these high-range products exported to Russia come from Western countries: The left panel shows no comparable increase in imports of high-range products from sanctioning countries to diversion countries.

We therefore have no clear evidence that the rise in FOB export prices to Russia is related to re-export by connecting countries. Econometric analysis confirms this result (Table E in Appendix). Products imported from sanctioning countries and re-exported to Russia do not display higher FOB unit values. While the import and re-export of certain products by countries close to Russia allows sanctions to be circumvented and gives Russia access to certain strategic products, it does not explain the observed overall increase in Russian import prices.

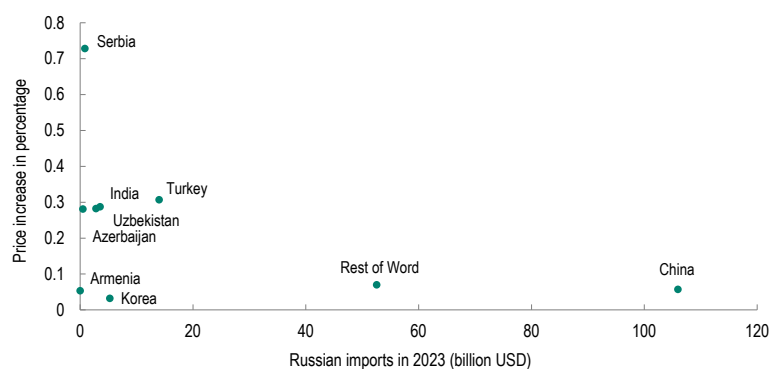
(8) High-range trade flows (origin-product-year) are defined as those whose unit values exceed the world median for that particular product by at least 15%.

2.5. An increase in margins

We have shown that the increase in Russian import prices was only partly due to an increase in transport and insurance costs, and was not attributable to the import and re-export of goods from sanctioning countries by non-sanctioning countries. This suggests that the rise in Russian import prices is mainly the result of exporters increasing their margins when exporting to Russia. The withdrawal of sanctioning countries from the Russian market enables Russia's new suppliers to raise their export prices. As noted above, this increase is found to be particularly important for strategic products but is also very heterogeneous across exporters (Figure 12). India, Turkey, Uzbekistan and Serbia are among the countries that increased their FOB price to Russia the most.

this suggests that the rise in Russian import prices is mainly the result of exporters increasing their margins when exporting to Russia

Figure 12 – Impact of sanctions on FOB prices



Source: Authors' estimates.

Conclusion

The fact that Russia continues to be able to purchase targeted products despite the sanctions raises questions about their effectiveness. The introduction of sanctions led to trade diversion; new suppliers, particularly China, substituted sanctioning countries such as those of the European Union on the Russian market. However, this substitution of suppliers has been costly for Russia. First, there is reason to believe that these new origin countries export products of lower quality, since they were less expensive than the sanctioning countries before the war. Since Russia did not import much from these countries before 2022, switching suppliers is a second-best option. Second, firms in non-sanctioning countries take advantage of trade diversion to raise their prices, which are also higher due to increased transportation and insurance costs. Western export restrictions have thus achieved one of their goals. They have made Russian supplies of strategic goods more difficult and more expensive, and of lower quality.

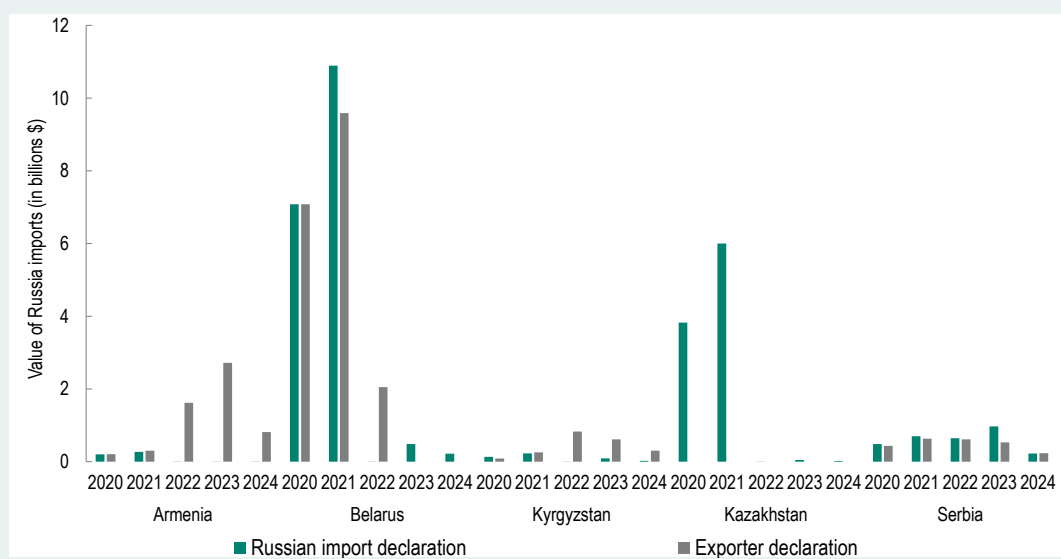
Box 1 – Concerns around Russian trade declaration

The United Nations COMTRADE database is the most widely used database for international trade analysis. It was not possible to use it to analyze the trade impact of export restrictions to Russia because Russia stopped declaring its flows in 2021. We relied on an alternative and more comprehensive dataset, the Global Trade Tracker, which provides monthly trade declarations (imports and exports) for all countries, including Russia, up to June 2024.

However, methodological issues remain, as Russian declarations do not always match those of its partner since the beginning of the war (see Figure). While Russia's declarations correspond well with

those of Serbia, for example, this is not the case for all countries. In particular, Russia has not reported any imports from Armenia or Kyrgyzstan since 2023, so we can rely on exporters' declarations alone for these bilateral flows. The case of Belarus is particularly problematic, as this country has ceased declaring its exports to Russia since 2023, while continuing to declare its trade with other destinations. Kazakhstan is also a problem, as it does not report any trade at all and Russia stopped declaring its imports from this origin after the start of the war. For this reason, we do not include Belarus and Kazakhstan in our analysis.

Figure – Comparing Russian declarations with mirror flows



Source: Authors' computation from Global Trade Tracker.

References

Emlinger, C. & Lefebvre, K. (2023). Commerce avec la Russie : des sanctions qui font plus de peur que de mal à nos exportations. *La Lettre du CEPII*, no. 442, November.

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Policy Brief



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Appendix

Table A – Comparing Russian import unit values by origin in 2021

	Russian import price (CIF): log(Unit Values) in 2021	
	(1)	(2)
Sanctioning origin	0.57*** (0.01)	
Sanctioning origin x targeted prod.		0.58*** (0.02)
Sanctioning origin x non-targeted prod.		0.57*** (0.02)
Fixed-effects	Product	Product
Number of observations	45.257	45.257
r2	0.67	0.67

Source: Authors' estimates.

Note: The table reports the result of a linear regression where the dependent variable is the log of the Russian CIF unit values (import value/import quantity) in 2021. As explanatory variables, we include dummy variables indicating whether the origin of the imports is sanctioning Russia and whether the imported good is targeted by sanctions. We include product fixed effects. Standard errors in parentheses are clustered at the destination country level *** p<0.01, ** p<0.05, * p<0.1.

Table B – Estimation of Russian import unit values (CIF)

	Import price (CIF): log(Unit Values)			
	(1)	(2)	(3)	(4)
War	0.12*** (0.00)			
Sanctioning origin x war		0.09*** (0.00)		
Non-sanctioning origin x war		0.20*** (0.01)		
Sanctioning origin x war x targeted prod.			0.07*** (0.01)	
Sanctioning origin x war x non-targeted prod.			0.12*** (0.01)	
Non-sanctioning origin x war x targeted. prod.			0.21*** (0.01)	
Non-sanctioning origin x war x non-targeted prod.			0.19*** (0.01)	
Sanctioning origin x war x strategic prod.				0.11*** (0.03)
Sanctioning origin x war x non-strategic prod.				0.09*** (0.01)
Non-sanctioning origin x war x strategic prod.				0.80*** (0.08)
Non-sanctioning origin x war x non-strategic prod.				0.19*** (0.01)
Fixed-effects		Origin-product-time		
		Origin-destination-product		
Number of observations	11,298,671	11,298,671	11,298,671	11,298,671
r2	0.90	0.90	0.90	0.90

Source: Authors' estimates.

Note: The table reports the result of a linear regression where the dependent variable is the log of the CIF unit values (import value/import quantity) from 2020 to June 2024. As explanatory variables, we include a dummy variable "War" equal to one after February 2022 if the importing country is Russia. We interacted this variable with dummy variables indicating whether the origin of the imports is sanctioning Russia, whether the imported good is targeted by sanctions or whether the good is strategic. We include origin-product-time and origin-destination-product fixed effects. Standard errors in parentheses are clustered at the destination country level *** p<0.01, ** p<0.05, * p<0.1

Table C – Estimation of CIF/FOB ratio of Russian imports

	CIF/FOB ratio: log(CIF Unit Values/ FOB Unit Values)			
	(1)	(2)	(3)	(4)
War	0.03*** (0.01)			
Sanctioning origin x war		0.04*** (0.01)		
Non-sanctioning origin x war		-0.01 (0.01)		
Sanctioning origin x war x targeted prod.			0.03*** (0.01)	
Sanctioning origin x war x non-targeted prod.			0.05*** (0.01)	
Non-sanctioning origin x war x targeted prod.			-0.02 (0.02)	
Non-sanctioning origin x war x non-targeted prod.			-0.00 (0.02)	
Sanctioning origin x war x strategic prod.				0.07* (0.04)
Sanctioning origin x war x non-strategic prod.				0.04*** (0.01)
Non-sanctioning origin x war x strategic prod.				0.43*** (0.10)
Non-sanctioning origin x war x non-strategic prod.				-0.02 (0.01)
Fixed-effects		Origin-product-time		
		Origin-destination- product		
Number of observations	11,298,671	11,298,671	11,298,671	11,298,671
r2	0.62	0.62	0.62	0.62

Source: Authors' estimates.

Note: The table reports the result of a linear regression where the dependent variable is the log of the CIF/FOB ratio of unit values (import value/import quantity) from 2020 to June 2024. As explanatory variables, we include a dummy variable "War" equal to one after February 2022 if the importing country is Russia. We interacted this variable with dummy variables indicating whether the origin of the imports is sanctioning Russia, whether the imported good is targeted by sanctions or whether the good is strategic. We include origin-product-time and origin-destination-product fixed effects. Standard errors in parentheses are clustered at the destination country level *** p<0.01, ** p<0.05, * p<0.1.

Table D – Estimation of export unit values (FOB) to Russia

	Export price (FOB): log FOB Unit Values			
	(1)	(2)	(3)	(4)
War	0.09*** (0.00)			
Sanctioning origin x war		0.05*** (0.00)		
Non-sanctioning origin x war		0.21*** (0.01)		
Sanctioning origin x war x targeted prod.			0.04*** (0.01)	
Sanctioning origin x war x non-targeted prod.			0.07*** (0.01)	
Non-sanctioning origin x war x targeted prod.			0.23*** (0.01)	
Non-sanctioning origin x war x non-targeted prod.			0.19*** (0.01)	
Sanctioning origin x war x strategic prod.				0.04 (0.03)
Sanctioning origin x war x non-strategic prod.				0.06*** (0.00)
Non-sanctioning origin x war x strategic prod.				0.37*** (0.07)
Non-sanctioning origin x war x non-strategic prod.				0.21*** (0.01)
Fixed-effects		Origin-product-time		
		Origin-destination-product		
Number of observations	11,298,672	11,298,672	11,298,672	11,298,672
r2	0.92	0.92	0.92	0.92

Source: Authors' estimates.

Note: The table reports the result of a linear regression where the dependent variable is the log of the FOB unit values (export value/export quantity) from 2020 to June 2024. As explanatory variables, we include a dummy variable "War" equal to one after February 2022 if the importing country is Russia. We interacted this variable with dummy variables indicating whether the origin of the imports is sanctioning Russia, whether the imported good is targeted by sanctions or whether the good is strategic. We include origin-product-time and origin-destination-product fixed effects. Standard errors in parentheses are clustered at the destination country level *** p<0.01, ** p<0.05, * p<0.1.

Table E – Re-exportation and export unit value (FOB) to Russia

	log(FOB Unit Values)		
	(1)	(2)	(3)
War x re-exported prod.	0.05** (0.02)		
War x non-re-exported prod.	0.24*** (0.01)		
War x targeted x re-exported prod.		0.05 (0.03)	
War x targeted x non-re-exported prod.		0.26*** (0.01)	
War x non-targeted x re-exported prod.		0.06* (0.03)	
War x non-targeted x re-exported prod		0.21*** (0.01)	
War x strategic x re-exported prod.			0.46* (0.27)
War x strategic x re-exported prod.			0.36*** (0.08)
War x non-strategic x re-exported prod.			0.05** (0.02)
War x non-strategic x re-exported prod.			0.24*** (0.01)
	Fixed-effects	Origin-product-time	
		Origin-destination- product	
Number of observations	2,220,840	2,220,840	2,220,840
r2	0.90	0.90	0.90

Source: Authors' estimates.

Note: The table reports the result of a linear regression where the dependent variable is the log of the FOB unit values (export value/export quantity) from 2020 to June 2024. As explanatory variables, we include a dummy variable "War" equal to one after February 2022 if the importing country is Russia. We interacted this variable with dummy variables indicating whether the good has been imported from sanctioning countries and re-exported to Russia (we consider a good to be re-exported by a country when its exports to Russia have increased by more than 50% after the war and when the volume of its exports to Russia exceeds 25% of imports from sanctioning countries), whether the imported good is targeted by sanctions or whether the good is strategic. We include origin-product-time and origin-destination-product fixed effects. Standard errors in parentheses are clustered at the destination country level *** p<0.01, ** p<0.05, * p<0.1.