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Sanctions against Russia: Export bans more effective than import restrictions

Following the start of Russia's full-scale war against Ukraine on February 24, 2022, in violation of international law, the most far-reaching economic sanctions since the Second World War were imposed. Their effects are often doubted. However, a closer look at the foreign trade data shows that export bans on technology-intensive goods have already put Russia in a precarious position and could destabilize it further if they are applied more systematically and consistently. In contrast, the import restrictions on oil and other raw materials, which were associated with high expectations, have done little to harm Russia.

After the annexation of Crimea, the USA, the EU, the other G7 and Western industrialized countries had already banned the export of armaments and dual-use goods, i.e. goods that can be used for both civilian and military purposes, to Russia. Following the Russian full-scale invasion of Ukraine in February 2022, these sanctions were gradually and significantly expanded through several sanctions packages. They include in particular

- entry bans for top Russian politicians, military commanders and oligarchs and the freezing of assets,
- a ban on transactions with the Russian central bank and the freezing of its currency reserves held at Western banks with a volume of USD 300 billion,
- the exclusion of Russian banks from the international payment system SWIFT,
- a ban on Russian aircraft flying over EU airspace and access to airports in the EU as well as entry bans for Russian trucks,
- import bans on crude oil and petroleum products as well as other raw materials and commodities and a price cap on Russian oil, which must be adhered to for transportation and insurance services,
- export bans on numerous goods, including advanced technology, certain types of machinery and vehicles, aerospace technology, seagoing vessels, equipment for the energy and petroleum industries, dual-use goods, capital goods that can strengthen Russian industrial capacity and a long list of luxury goods.

The relevant legal basis in the EU is Council Regulation (EU) No. 833/2014, which was adopted in 2014 and has been updated and expanded by the various sanctions packages. Many of the sanctions imposed also extend to Belarus. In addition to the USA, the EU and the other G7 countries, Switzerland, Norway, Iceland, Australia, New Zealand, South Korea, Taiwan, and Singapore have also joined the sanctions with similar measures. Together, these countries represent almost 60% of global GDP and international trade and therefore carry a great deal of economic weight.

In the media, in political circles and in academic studies, the effectiveness of the sanctions is often doubted. This is justified by Russia's unexpectedly high economic stability since the start of the war. In 2022, Russian GDP fell only slightly by 2.1%. The International Monetary Fund (IMF) is forecasting growth of 2.2% for 2023 and 1.1% for 2024. The inflation rate was 13.8% in 2022 and, according to IMF forecasts, will fall to 5.3% in 2023 and 6.3% in 2024.[1] The stabilization of the Russian economy and its resistance to the sanctions imposed is mostly attributed to the increased revenues from

[1] International Monetary Fund (2023): World Economic Outlook. October 2023.

commodity exports, which had filled the Russian state's war chest well. The Russian state budget grew by 17% in nominal terms in 2022 and by a further 4% in 2023. Decisive intervention by the Russian central bank with a drastic increase in interest rates and strict capital controls, according to the narrative, was able to correct the temporary crash in the rouble exchange rate immediately after the start of the war. Since the end of 2022, however, the rouble has lost much of its value again. Overall, the economic data are nevertheless so stable that the conclusion is often drawn that the sanctions imposed on Russia have not been effective.

A lack of effectiveness is also purported by the fact that goods subject to sanctions are repeatedly entering Russia. Examples include semiconductors from Western manufacturers in Russian missiles and drones that hit Ukraine, or machine tools from Germany, Italy or Japan sighted in Russian arms factories. They are seen as evidence of clandestine supply channels to Russia, which are used to circumvent the sanctions imposed.

The interplay between import and export sanctions

These arguments often fail to make a sufficient distinction between import and export sanctions. These two instruments are based on two different channels of action. Import sanctions are an attempt to reduce Russian export revenues from the sale of raw materials, especially oil and gas. A significant proportion of the revenue from oil and gas supplies flows into the Russian state coffers via the Russian commodity companies through the taxes they must pay. By stopping oil and gas imports from Russia, Putin's war chest is to be drained and the financial resources for the procurement of missiles, mines, tanks, and ammunition and for soldiers' salaries are to be cut.

In the first few months after the start of the war, when Russia was still supplying gas to the EU, there were heated and sometimes very emotional debates in Germany and other countries as to whether and to what extent gas imports were indirectly promoting and facilitating Russian war crimes in Ukraine. In a much-discussed study just a few days after the start of the war, several economists argued that an immediate gas embargo would only lead to minor losses in growth in Germany and would therefore be economically manageable.[2] In contrast, other studies had warned of very high growth and job losses.[3] From the rather optimistic study on the consequences of a rapid gas embargo (Bachmann 2022), the conclusion was often drawn that Germany could make an effective contribution to ending the war quickly by instantaneously stopping gas and oil imports from Russia without incurring high costs. Conversely, a continuation of gas supplies from Russia would unnecessarily prolong the suffering of the people in Ukraine. This issue was ultimately decided by Russia itself through the gradual reduction and complete termination of gas supplies following the attack on the Nordstream pipeline. As Russian pipeline gas continued to be supplied for six months after the outbreak of the war, albeit in reduced quantities, industry and households had more time to adjust to the changed supply situation. In addition, the gas storage facilities could be replenished over the summer of 2022. It is therefore not easy to say whether a rapid gas embargo would have been possible after the start of the war without major disruptions. A further study by part of the same

[2] Bachmann, Rüdiger, David Baqaee, Christian Bayer, Moritz Kuhn, Andreas Löschel, Benjamin Moll, Andreas Peischl, Karen Pittel, Moritz Schularick (2022): What if? The economic effects for Germany of a stop of energy imports from Russia. ECONtribute Policy Brief 28/2022.

[3] For example IMK (2022): Ukraine-Krieg erschwert Erholung nach Pandemie. IMK Report Nr. 174. Krebs, Tom (2022): Auswirkungen eines Erdgasembargos auf die gesamtwirtschaftliche Produktion in Deutschland. IMK Study Nr. 79, Mai 2022. Prognos AG (2022): Folgen einer Lieferunterbrechung für die deutsche Industrie. Juni 2022.

group of authors nevertheless saw their view confirmed a year and a half after the start of the war.[4] However, all studies had failed to take into account the consequences of a gas supply freeze from Russia for inflation, to which the ECB responded with a drastic increase in the key interest rate, now slowing down growth in the entire eurozone. An assessment of the feasibility of a rapid gas embargo would therefore also have to address the question of whether inflation would not have risen even more as a result.

More important for the question of the effectiveness of import sanctions, however, is whether Russia would actually have been effectively prevented from continuing the war against Ukraine unabated without the revenue from gas supplies to Germany and other European countries. To answer this question, it is helpful to take a closer look at Russia's current account and balance of payments. Russian oil and gas exports initially lead to rising foreign currency revenues. Russian energy companies have to convert these into roubles via the banking sector so that they can meet their domestic payment obligations, including taxes to the state.[5] Regardless of how this exchange is carried out, it leads to increasing foreign currency holdings at some point in the Russian economy, usually at the banks, at the expense of their rouble accounts. The foreign currency can only be used to settle import invoices or to reduce foreign liabilities, or it can be used to increase foreign assets. Russia therefore initially only benefits from its gas and oil exports in that it can import more goods. An indirect effect is that this also stabilizes the rouble exchange rate and thus the prices for imported goods. However, exports do not increase domestic production potential. In real economic terms, export earnings therefore benefit Russia above all if they are used for higher imports. This only helps the Russian war chest if it is used to import armaments or machinery for their production from abroad. However, this is exactly what the USA, the EU and their allies want to prevent by banning the export of war-related goods.

It is therefore important to distinguish between the different channels of action of import and export sanctions. Import sanctions are intended to cut off Russia's financial resources for the import of armaments and other products necessary for the war economy. The aim of export bans, on the other hand, is to directly deny it access to these products. Export sanctions therefore have a direct effect, while import sanctions take a circuitous route by reducing the ability to pay abroad. Export sanctions also allow the sanctioning countries to determine exactly which goods they wish to withhold from the sanctioned country and which they continue supplying for humanitarian reasons, such as food, pharmaceuticals and medical devices. In the case of pure import sanctions that are not supplemented by export bans, Russia could decide for itself whether to use the reduced foreign currency income to import weapons or food. Import sanctions alone can therefore not guarantee that the sanctioned country is deprived of buying armaments abroad; instead, product-specific export bans are necessary. On the other hand, their effect is limited if not all countries participate in the sanctions and, like China for example, continue to supply or provide substitutes.

It should also be borne in mind that import sanctions, particularly for raw materials, can have considerable negative humanitarian consequences for third countries, especially developing countries. This is because the sanctioning countries do not completely forego the affected raw materials, but instead switch to other suppliers who reduce their deliveries to third countries if they cannot or do not want to expand their production. The resulting supply shortage leads to price increases that all consumers must bear and push those with the lowest ability to pay out of the

[4] Moll, Benjamin, Moritz Schularick, Georg Zachmann (2023): The Power of Substitution: The Great German Gas Debate in Retrospect. Brookings Papers on Economic Activity. September 2023.

[5] At the end of March 2022, Russia ordered the customers of its gas companies to pay their bills in roubles, but this clashed with EU sanction conditions. Russia's aim was to stabilize the rouble exchange rate. Ultimately, however, it does not matter who makes the exchange.

market. These are mainly developing countries. This is exactly what happened after the supply freeze for Russian gas. In the late summer of 2022, Germany was prepared to pay any price for gas on the global market to replenish its gas reserves so that other consumers, especially developing countries, could no longer compete.

The situation was different for oil, as this market is much larger and reacts more flexibly to changes in demand. The EU countries replaced Russian oil with imports, primarily from the Middle East and Africa. These countries reduced their supply volumes to India and other developing countries, which in turn bought the Russian oil that was no longer sold to EU countries. The quantities traded on the world market remained unchanged, world market prices rose, only Russia had to accept price reductions, which benefited its new customers in India and other parts of Asia and Africa. And the Europeans could have a quiet conscience because they were no longer consuming Russian oil and paying into the Russian war chest themselves.

This is where the EU and the other sanctioning countries came in with their price cap of USD 60 per barrel for Russian oil, which was agreed at the end of 2022. Since then, transportation and insurance services for Russian oil supplies are only permitted if this threshold is not exceeded. The aim is to keep Russian oil in terms of volume, accounting for around 10% of global exports, on the world market, and so to avoid a shortage of supply with generally rising oil prices and their detrimental economic consequences, but to curtail the profits of Russian oil suppliers. This worked quite well for some time, until oil prices rose again in the early summer of 2023 due to reduced production volumes, which also benefited Russia.

It is questionable whether import bans on goods whose global supply should not be reduced for humanitarian or global economic reasons are sensible and practicable at all. If the production volume and thus the supply on the world market is not to fall and the world market price is to remain stable, then someone has to buy the Russian oil and pay for it. It is then of secondary importance who does this. What matters is that the oil price is confined.

Russian balance of payments: how have the current account surpluses been used?

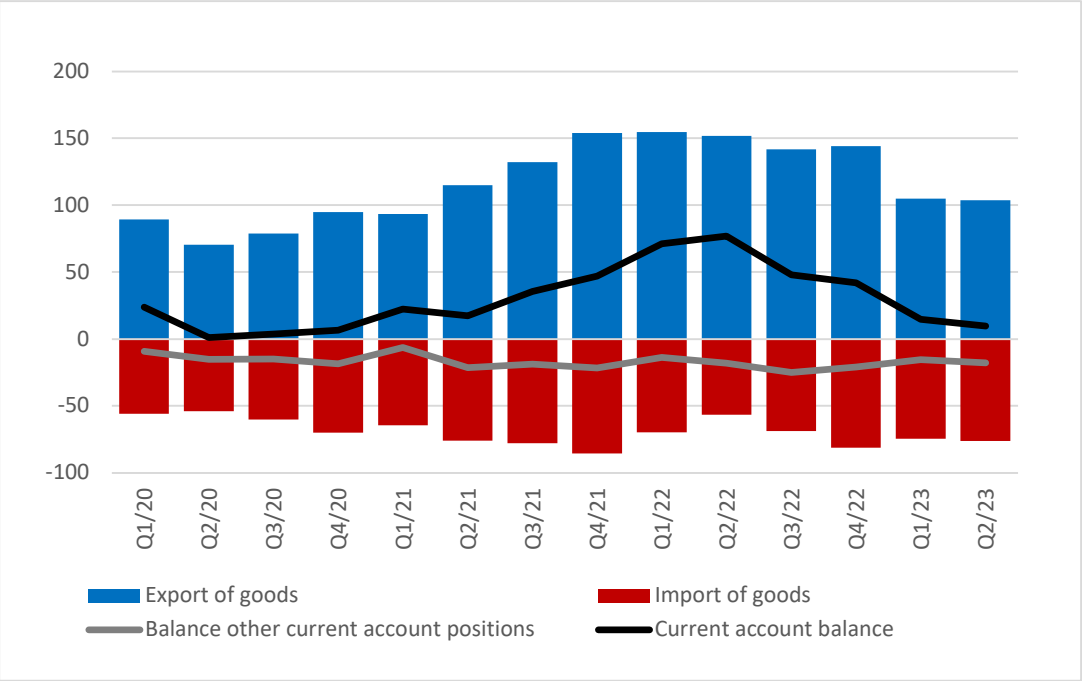
Irrespective of this, the question arises as to whether the extraordinarily high income from oil and gas exports, which will continue well into the second half of 2022, actually helped Russia or was even necessary to finance the war in Ukraine. The Russian current account provides an answer to this. Russia's export revenues totaled USD 593 billion in 2022 (blue columns in Figure 1), while imports amounted to USD 277 billion (red columns). The trade balance thus showed a surplus of USD 316 billion. Other payment obligations included in the current account (trade in services, cross-border payments for labor and capital income and transfer payments) totaled USD 78 billion (grey line). After deducting these, a current account surplus of USD 238 billion remained (black line).[6] Due to the oil and gas price increases, the current account surplus rose steadily to a record USD 77 billion by the second quarter of 2022 and then fell again to USD 10 billion by the second quarter of 2023.

Russia's current account surpluses, which have risen continuously since 2020, were primarily the result of higher export revenues driven by commodity prices, while imports did not show a pronounced upward trend. In the first half of 2022, i.e. around the time of the start of the war, Russian imports were slightly below the long-term trend; in the following quarters, they no more reached the peak value from the fourth quarter of 2021. In the first two quarters of 2023, export revenues were around a third lower than in the previous quarters. The recurrence of lower oil prices

[6] International Monetary Fund (2023): World Economic Outlook. October 2023.

put an end to the boom in Russian export revenues and brought them back to their long-term normal level. In contrast, Russian imports changed little in the first half of 2023 compared to the previous quarters.

Figure 1: Trade and current account balance of the Russian Federation in USD billion, Q1/20 - Q2/23



Source: International Monetary Fund: Balance of Payments and International Investment Statistics (BOP/IIP)

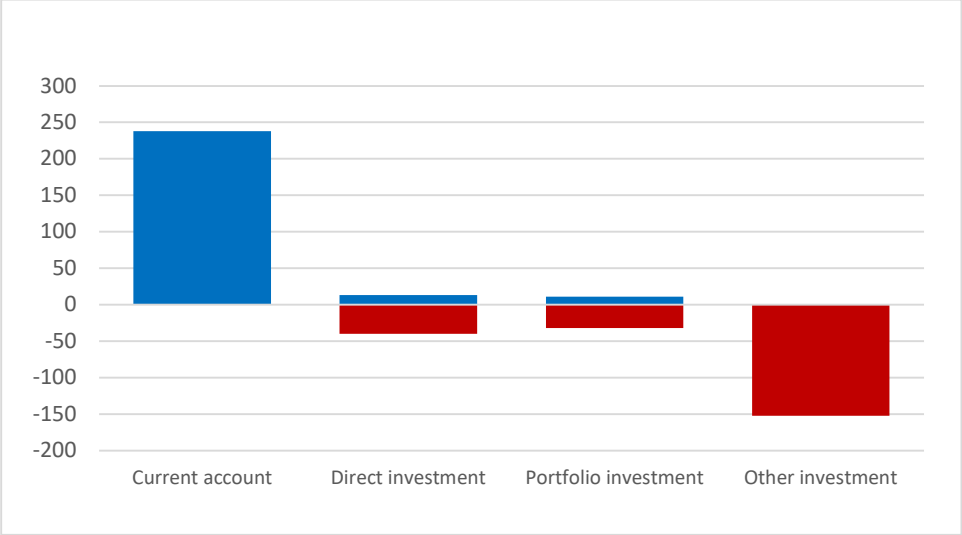
However, the exorbitant current account surplus of USD 238 billion in 2022 now means that almost half of Russia's export revenues were not spent on goods imports or on servicing other payment obligations abroad. While a high current account surplus may be an expression of a country's economic strength and give it financial security (provided its assets are not frozen by sanctions), it is so high precisely because the export revenues were not used to import more military equipment and other goods. This is certainly not due to the thriftiness of the Russian economy but is a first and strong indication of the effectiveness of the export sanctions imposed by the EU, the USA and others. Although Russia has the financial resources for higher imports through its raw material exports, it is prevented from using them for this purpose by the sanctions.

If the Russian current account surplus was not used for higher imports, where did it go? A current account surplus is the mirror image of an equally high capital export in the balance of payments. By definition, what a country generates in real economic terms as current account surplus flows back abroad as capital export in the balance of payments. According to the balance of payments data published by the International Monetary Fund (Figure 2), Russia had to pay USD 40 billion in compensation for direct investments and USD 32 billion for portfolio investments (i.e. securities and other debt instruments) in 2022, which foreign investors withdrew from Russia after the outbreak of the war.[7] Numerous international companies operating in Russia ceased operations and sold their production facilities, real estate and other assets, albeit often below their market value, to domestic companies and banks, which paid USD 72 billion for them. However, Russian companies also scaled

[7] International Monetary Fund (2023): Balance of Payments and International Investment Statistics (BOP/IIP). https://data.imf.org/regular.aspx?key=62805740

back their foreign investments in Western countries and received payments totaling USD 24 billion, of which USD 13 billion was for direct investments and USD 11 billion for portfolio investments. These must be offset against the payments made to investors who left Russia. As a result, the net amount in the Russian balance of payments for declining direct and portfolio investments fell to USD 48 billion.

Figure 2: Russia's current account and balance of payments 2022: inflows and outflows by type of investment in USD billion



Source: International Monetary Fund: Balance of Payments and International Investment Statistics (BOP/IIP)

However, at USD 152 billion, most of the current account surplus flowed into ordinary bank accounts abroad under the heading "Other investment". According to calculations by the International Monetary Fund, foreign account holdings owned by Russian investors rose from USD 410 billion at the end of 2021 to USD 549 billion a year later.[8] This trend basically continued in the first half of 2023, albeit to a lesser extent, as the current account surplus had fallen. Foreign direct investment in Russia fell by a further USD 9 billion and foreign-owned securities holdings by USD 5.5 billion. 22 billion US dollars flowed into the other investment accounts of Russian investors.

As Russia has only published incomplete economic and financial statistics since the beginning of the war and the International Monetary Fund's estimation methods have also reached their limits as a result, the total use of the current account surplus cannot be determined precisely. However, the figures given for the outflows in the balance of payments are relatively close to the current account surplus, so that they should reflect the approximate order of magnitude reasonably accurately. This does not take into account the now secret currency reserves of the Russian central bank, which amounted to USD 630 billion before the start of the war and of which USD 300 billion was frozen as a result of the sanctions imposed. It can be assumed that the sharp rise in other financial assets are largely hidden currency reserves that the Russian central bank and the Russian state have deposited in accounts in friendly countries or tax havens via banks that have not yet been decoupled from international payment transactions.

A look at the Russian state budget also shows that the huge current account surplus has not led to significantly higher government revenues and expenditures. Although government revenues rose from 48.1 trillion roubles in 2021 to 53.2 trillion roubles in 2022, they are expected to fall again to

[8] Ibid.

51.7 trillion roubles in 2023. Expenditures rose from 47.1 trillion roubles (2021) to 55.2 trillion (2022) to an expected 57.6 trillion (2023).[9] Taking into account the inflation rate of 13.8% in 2022 and 5.3% in 2023, there was no real growth at all in government revenues and only weak growth in government spending in 2022. The current account surplus was therefore reflected in only moderate increases in government revenues and spending. Against this backdrop, it is highly unlikely that an immediate oil and gas embargo by Germany and the other countries with sanctions would have prevented Russia from financing its war plans and caused it to cease hostilities. In addition, Russia has considerable leeway in terms of government borrowing, as its debt level of just 21% of GDP is significantly lower than that of Western industrialized countries. Even if Russia had had to completely forego the proceeds from oil and gas exports to the Western sanctioning countries, it would have had enough financial resources to purchase armament goods from abroad in sufficient volume. Ultimately, limited production capacities in the Russia's arms industry and the export bans imposed by the West on armaments and dual-use goods prevented a greater buildup of arms.

Export bans are more effective than import sanctions

This brings the export sanctions imposed by Western industrialized nations and their allies into focus. They are more important and more effective than import sanctions in weakening Russian aggression against Ukraine. Export sanctions are aimed at directly denying Russia access to war-related goods produced in the West, depriving it of the machinery and equipment needed to manufacture them and blocking the country's infrastructure and transportation system. A differentiated, product-specific look at foreign trade data is helpful to examine their effectiveness.

The effectiveness of export sanctions depends on various technological, competitive, and political factors both in the countries that impose them and in the target countries.[10] In many cases, they fail due to a lack of or unfavorable conditions, but often also due to unclear objectives and a lack of discipline in their monitoring and enforcement. It is important to assess the economic strengths and weaknesses of both parties to the conflict on a sectoral, preferably product-specific basis and to analyze possible evasive reactions. The critical factor for success is how dependent the target country of the sanctions is on the products affected by the supply bans and what substitution options it has.

A country affected by sanctions, such as Russia, has four options for responding:

Firstly, it can produce the goods that are no longer available itself if it possesses the necessary economic and technological capabilities. Following the sanctions imposed in 2014 due to the annexation of Crimea, Russia adopted an import substitution strategy known as "localization", which was only moderately successful. In many sectors, Russian companies were only allowed to import intermediate products or capital goods from abroad if not at least two Russian suppliers were available for the required product. This was intended to protect and promote domestic industry. Foreign companies were attracted to invest in Russia with the prospect of being recognized as Russian suppliers. Throughout economic history, developing economies have repeatedly tried to catch up with the leading economic nations with such protective measures, but in many cases this

[9] International Monetary Fund (2023): World Economic Outlook Database. https://www.imf.org/en/Publications/WEO/weo-database/2023/October

[10] Nicholas Mulder has recently analyzed these factors very vividly in a comprehensive economic-historical analysis of the sanctions imposed in the first half of the 20th century, including the naval blockades against Germany and the Ottoman Empire in World War I and various more or less successful sanctions and attempts at sanctions in the 1920s and 1930s in the Balkans as well as against Italy (because of its colonial occupation of Ethiopia) and against Japan (because of its aggression on the Chinese mainland). Nicholas Mulder (2022): The Economic Weapon. The Rise of Sanctions as a Tool of Modern War. New Haven, London 2022.

has had only limited success and has often been associated with negative side effects. They failed above all when the protective measures - such as the Russian "localization policy" - were designed for an indefinite period and aimed at permanent decoupling from the world market.

After the collapse of the Soviet Union, however, Russia initially pursued a completely different economic strategy. Based on the recommendations of classical foreign trade theory, Russia aimed to integrate into the international division of labour and exploit its specialization advantages. Russia saw its comparative advantages in the extraction of raw materials and neglected the manufacturing industries. The export of oil, gas and other raw materials generated such high revenues on the world market that it became more profitable to concentrate economic resources fully on these and to procure more and more high-quality industrial goods abroad instead of producing them domestically. This was also in the interests of the powerful oligarchs who owned the Russian energy and raw materials companies, as they were able to make higher profits from raw materials than from industrial goods. As a result, Russia largely lost its Soviet-era skills in the production of aircraft, road vehicles, electronic products, and machine tools, among other things, which were not necessarily competitive with those of Western industrialized countries. Rebuilding these is not easy. It is therefore unlikely that Russia will be able to replace the technologically high-quality products from Western industrialized countries affected by sanctions with its own production on a broad scale. The economic and technological decoupling from the leading industrial nations will prevent Russia from developing an industry that can compete internationally in cutting-edge technologies. Under these conditions, Russia will only be able to manufacture products of inferior quality itself. Even if this strategy were to have a chance of success in some areas, it would require a long lead time.

A second alternative is to procure the products affected by sanctions from countries that have not joined the sanctions. This is the most frequently raised objection to the effectiveness of export sanctions against Russia. As it is predominantly high-tech products that are affected by the sanctions, only countries that have the ability to manufacture them and can also supply the required quantities at short notice can be considered. Outside the group of 40 countries with sanctions against Russia, this practically only applies to China, which has caught up technologically with the leading industrialized countries in many areas and, due to its size, is also able to supply the large quantities of sanctioned goods that Russia has previously purchased from the Western countries. Hong Kong is also repeatedly mentioned as a candidate for replacing sanctioned goods. However, its exports to Russia initially fell sharply after the start of the war and then only recovered moderately. In the case of electronic goods such as mobile phones and computers, Vietnam, which has developed into an important production location for electronic consumer goods and has also not imposed sanctions against Russia, could also have stepped in. However, as Vietnam has not yet published any foreign trade data for 2022 and 2023, this cannot be verified at present. The other countries in Southeast Asia can only fill the gaps created by the sanctions to a very limited extent. Turkey can be considered as a supplier country for technologically mature products, but not for cutting-edge technologies. Iran, which supplies drones to Russia, should also be mentioned. As no recent monthly trade data are available from there either, verification is not possible. However, it can be assumed that Iran has also only stepped in as a supplier country for mature technologies.

In the case of deliveries from China and other non-sanctioning countries, it must also be taken into account that the products in question are often manufactured by multinational companies headquartered in the USA, the EU or other countries with sanctions or are produced on their behalf or under licenses granted by them. They are therefore subject to the law of their country of domicile and are obliged to comply with the sanctions provisions, even if production takes place in a country that has not imposed sanctions.

The third option is to circumvent the sanctions by sourcing sanctioned goods via third countries. The member countries of the Eurasian Economic Union, which are linked to Russia by a customs union and open economic borders (Armenia, Belarus, Kazakhstan and Kyrgyzstan), are particularly suitable for this. Deliveries to these countries are not subject to sanctions. This makes it possible to deliver goods intended for Russian customers via intermediaries in these countries.[11] Such goods are often sent pro forma to intermediaries in Caucasus or Central Asian countries via Russia as a transit country and intercepted directly in Russia. Although Georgia is not a member of the Eurasian Economic Union, it is also considered a bypass country due to its geographical location between Russia and Armenia and the complicated situation caused by the Russian occupation and de facto economic annexation of its provinces of Abkhazia and South Ossetia. According to press reports, deliveries to Russia are also being circumvented via Turkey and the United Arab Emirates.[12] This is often organized via middlemen who have set up nested company structures based in tax havens as a cover, making it difficult to identify the real players. These are often purely letterbox companies backed by Russian citizens.

Detour deliveries always require the cooperation of the manufacturers of the sanctioned products, even if it is only that they refrain from tracking and sanctioning in the event of targeted deception. However, it also happens time and again that manufacturers actively and tacitly cooperate in this process out of commercial interest. With the 10th and 11th sanctions packages of February 24, 2023 and June 23, 2023 respectively, the EU has responded to the circumvention of sanctions provisions with, among other things, a transit ban on sanctioned goods through Russia to third countries, the introduction of increased due diligence for companies and improved cooperation with the governments of third countries.[13] However, as the member states are responsible for implementing the sanctions, they are not always applied uniformly.

If these three response options are ruled out, the only fourth option left for Russia is to completely abdicate the products affected by sanctions. This is precisely what the sanctions aim to achieve. However, even this does not necessarily mean that Russia will be harmed if it can achieve the intended benefit in other ways. The extent of the damage to Russia depends on the importance of the affected products for its economy, in particular for arms production and for the infrastructure required for warfare, and whether they can be substituted by other, still available products.

There are also conditions for success on the part of the countries imposing the sanctions. Sanctions are particularly promising if the world market share of the sanctioning countries is very high, so that there are only few alternative sources of supply for Russia. It is therefore very important that as many countries as possible with a high share of world trade participate in the sanctions for them to be successful. The number of 40 sanctioning countries with a share of around 60 % of global exports and in some cases over 80 % for cutting-edge technologies is considerable. The effectiveness is also high if production is concentrated in just a few companies that are also based in sanctioning countries, so that deliveries from non-sanctioning countries to Russia are also prevented. A high level of supply transparency is also helpful, so that circumventing deliveries is made more difficult. This applies, for example, to products with high security requirements, as well as to very expensive and bulky

[11] See Chupilkin, Maxim, Beata Javorcik and Alexander Plekhanov (2023): The Eurasian Roundabout. Trade Flows into Russia through the Caucasus and Central Asia. European Bank for Reconstruction and Development, London, February 2023.

[12] For Example „Tödliche Grüße aus dem Westen“, Süddeutsche Zeitung, 20. September 2023.

[13] Council Regulation (EU) 2023/426 of 25 February 2023 amending Regulation (EU) No 269/2014 concerning restrictive measures in respect of actions undermining or threatening the territorial integrity, sovereignty and independence of Ukraine; Council Regulation (EU) 2023/1214 of 23 June 2023 amending Council Regulation (EU) No 833/2014 concerning restrictive measures in view of Russia's actions destabilizing the situation in Ukraine.

products such as aircraft, which are difficult to conceal. It is important that the sanctioning countries apply the sanctions as uniformly and consistently as possible and punish violations equally in all countries.

The sanctions also have a time dimension. Durable products, especially capital goods, that were purchased before the sanctions were imposed can still be used. In the case of these products, sanctions only become noticeable when they are no longer functional and a need for replacement arises, if spare parts are missing that are also affected by the sanctions, or if there is an additional demand that can no longer be met. In the case of consumer goods, on the other hand, the negative effects occur more quickly and can only be delayed somewhat if large stocks are held. A long product life and high stock levels mean that the sanction effects only become noticeable after some time. The development of new production capacities and the opening up of new sources of supply have the opposite effect. They cause the sanction effects to weaken over time.

The empirical test: How have the export bans affected Russian foreign trade?

The export sanctions against Russia have achieved their goal if it is effectively cut off from the supply of critical goods that it needs for its war effort so that it can no longer achieve its war aims. With the sanctioning countries accounting for 60% of global trade, it is unrealistic to expect Russia to be completely cut off from foreign goods. However, as they jointly hold a dominant position on the world market for many technology-intensive products, it is quite possible, if the sanctions are implemented consistently, to impose such severe supply bottlenecks on Russia for many key products that its ability to wage war will be permanently impaired. This can be verified using the international trade data that international organizations regularly compile on the basis of customs data. The following analysis is based on the Trade Map database of the International Trade Center (ITC), an organization jointly supported by the UN trade organizations UNCTAD and WTO.[14] It combines trade data from the UN Comtrade database and national statistical offices and customs authorities to create a data network of international trade relations with a deep sectoral, geographical and temporal structure.

Trade Map of the International Trade Center ITC

The ITC's Trade Map publishes annual, quarterly, and monthly foreign trade data for 220 countries and approx. 5,300 individual products in a 2-, 4- or 6-digit breakdown of the internationally standardized list of goods for foreign trade statistics (HS - Harmonized System), which is based on customs tariff numbers. All cross-border deliveries of goods recorded by the national customs authorities are recorded. Data sources are the national statistical offices, customs authorities and the UN database Comtrade. The ITC assumes a coverage rate of 97% of all goods traded worldwide. The short-term availability and monthly publication method (77 countries, which account for almost 2/3 of total global trade, publish detailed monthly trade data after four months at the latest, while a further 36 countries with a share of global trade of around 15% report monthly data, albeit only in a block for a previous calendar year) enable very timely and differentiated analyses.

[14] https://www.trademap.org/Index.aspx
A detailed presentation of the data offered by Trade Map is provided by International Trade Center (2014): Trade Map User Guide. Trade Statistics for International Business Development. Geneva, November 2014.

Individual countries, particularly those affected by economic sanctions, refuse to transmit their data. Some developing countries only provide incomplete data or deliver with a delay. Countries that are used as hubs for semi-legal or illegal transactions, facilitate money laundering or support tax avoidance or evasion (a significant example is the United Arab Emirates) also tend to publish their trade data incompletely or conceal it. However, since all deliveries of goods are recorded twice (as exports of the exporting country and imports of the importing country), it is possible to record the foreign trade of non-reporting countries via the mirror data, i.e. to derive the exports of these countries from the imports of the recipient countries and the imports from the exports of the supplier countries. However, no foreign trade data is available on bilateral trade between countries that do not report or report incompletely, as no mirror data can be calculated for them. The quality and interpretability of the data is also limited by:

- Failure to record goods smuggled past the customs authorities,

- Inclusion of purely commercial goods that are only delivered for forwarding to third countries,

- Change of destination countries after leaving the country of origin,

- inconsistent application of product classifications and unintentional or deliberate misclassifications,

- in some cases, missing information on product classifications or countries of origin or destination.[15]

Russia, like other countries with economic sanctions (in particular Belarus, North Korea, Syria, Venezuela), stopped publishing its trade data at the beginning of 2022. Current trade data on Russia for the period since the start of the war can therefore only be derived from the mirror data of its trading partners. This poses a certain problem for Russia's trade with China, Russia's largest trading partner, because the latter only reports monthly data retrospectively once a year for the previous calendar year. Chinese trade data are currently only available up to December 2022. Russia's former Soviet republics, with which Russia is linked by the Eurasian Economic Union and has open borders, are also important trading partners. Of these, only Armenia publishes timely monthly trade data, as does Georgia, which is not a member of the Eurasian Economic Union but still trades intensively with Russia.

Nevertheless, Russia's trade relations can also be depicted relatively reliably at the current margin using the mirror data. The International Trade Center's Trade Map data enable a very detailed, almost product-specific and country-specific presentation of Russian foreign trade in a monthly presentation for most countries well into 2023. This makes it possible to show very precisely how trade in products and product groups particularly affected by export sanctions developed after the start of the Russian invasion of Ukraine.

The products subject to export sanctions have been specified in technical detail in the relevant EU regulation.[16] The in-depth product breakdown of the trade map data based on the harmonized system (HS) of foreign trade statistics enables a relatively good distinction between sanctioned and non-sanctioned products and product groups, but remains blurred in some cases due to many exceptions in the sanctions provisions. Agricultural products and foodstuffs, pharmaceuticals, machinery and preliminary products for their production as well as medical technology are exempt

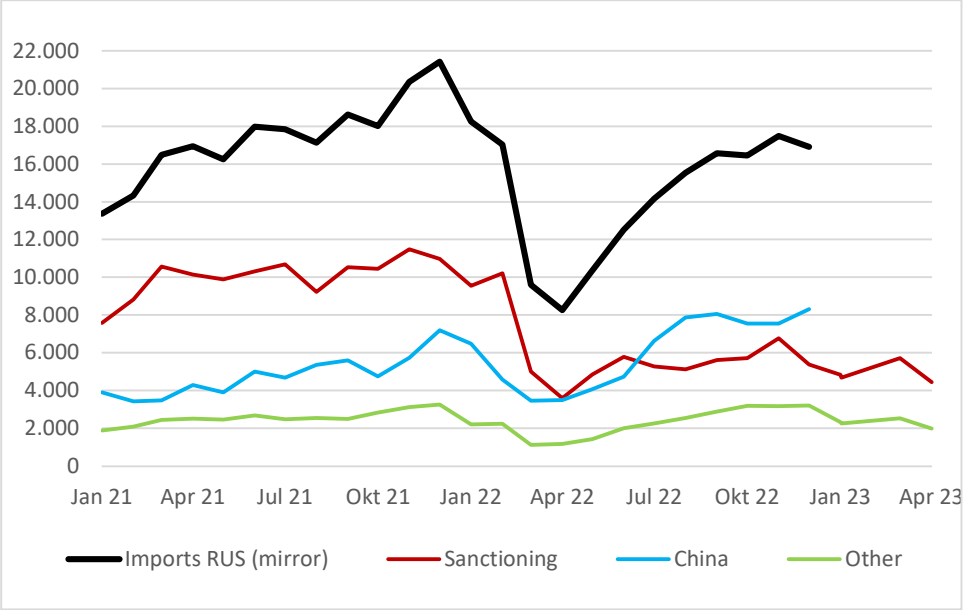
[15] See International Trade Center (2014): Trade Map User Guide. Trade Statistics for International Business Development. Geneva, November 2014, pp 109ff.

[16] COUNCIL REGULATION (EU) No 833/2014 of 31 July 2014 (*) concerning restrictive measures in respect of Russia's actions destabilizing the situation in Ukraine, as last amended by COUNCIL REGULATION (EU) 2023/1214 of 23 June 2023.

from sanctions. The sanctioned products are concentrated in HS groups[17] 84 (machinery), 85 (electronics), 87 (road vehicles), 88 (aircraft and spacecraft), 89 (ships) and 90 (optics, measuring and precision technology). These are the focus of further analysis. In the case of consumer goods, only luxury goods are affected by the sanctions.

Figure 3 shows the development of exports to Russia of all countries (black line) that publish timely monthly trade data, as well as the exports of the 40 sanctioning countries (red), China (blue) and all other non-sanctioning countries with monthly reporting practices (green) from January 2021 to April 2023. Russia's imports are measured as the sum of all globally reported exports to Russia (mirror data), as Russia has not published its own trade data since the beginning of 2022. With 113 countries reporting monthly data and accounting for around 83% of global trade, the mirror data can be said to provide good coverage of Russia's foreign trade. Countries that do not report monthly trade data are mainly small and underdeveloped countries with low foreign trade. Distortions are largely limited to agricultural products, raw materials, and simple consumer goods, which are less significant for the export sanctions, while the coverage of the technology-based industrial products of interest here is very good overall. The curves for Russia's total imports and deliveries from China end in December 2022 because China has not yet published monthly figures for 2023 and these account for a very high proportion of Russian imports.

Figure 3: Monthly exports of sanctioning countries and other important supplier countries to Russia in million EUR, Jan 2021 - Apr 2023



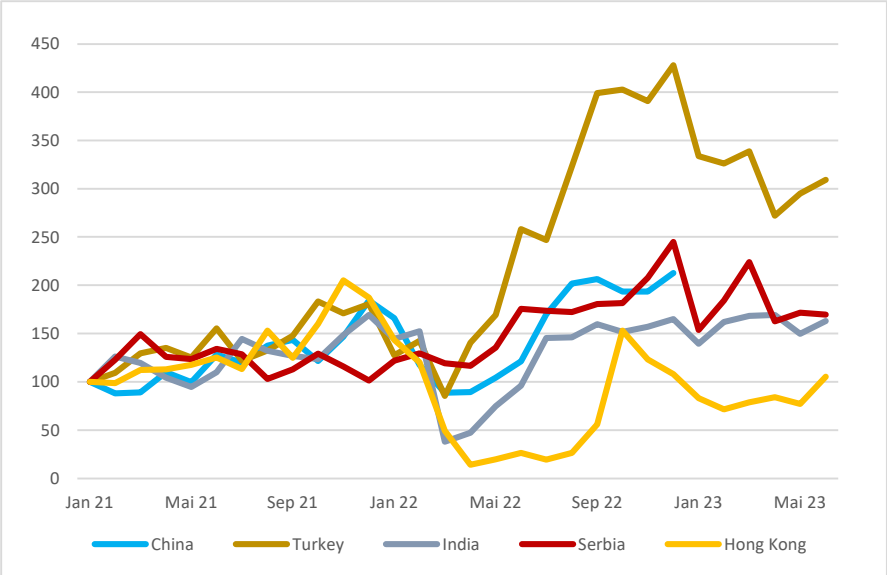
Source: Trade Map of the International Trade Center (ITC)

First of all, it is noticeable that Russia's imports rose steadily over the course of 2021 until the start of the war, from EUR 13.4 billion in January to EUR 21.4 billion in December 2021. This could be a catch-up effect after the pandemic. However, the increase could also be interpreted as a build-up of stocks

[17] HS: Harmonized System. Vgl. International Trade Center (2014): Trade Map User Guide. Trade Statistics for International Business Development. Geneva, November 2014.
https://www.trademap.org/Docs/TradeMap-Userguide-EN.pdf
Destatis – Statistisches Bundesamt (2023): Warenverzeichnis für die Außenhandelsstatistik, Wiesbaden 2023.
https://www.destatis.de/DE/Methoden/Klassifikationen/Aussenhandel/Downloads/WA2023-3200300-23700-4.pdf?__blob=publicationFile

in anticipation of sanctions. After the start of the war, global monthly deliveries to Russia fell to just over €8 billion in April 2022 and then rose again to around €17 billion. However, they remained below the peak values of the previous year. The growth in Russian imports over the course of 2021 is primarily due to rising deliveries from China, while deliveries from the sanctioning countries stagnated at around €10 billion per month even before the start of the war. Exports from the sanctioning countries fell to €4 billion after the start of the war and then only recovered slightly to monthly figures of €5 to 6 billion. After a temporary decline at the beginning of 2022, China increased its deliveries to Russia to peak values of around EUR 8 billion per month in the second half of 2022. The war against Ukraine and the sanctions imposed afterwards have made Russia precariously dependent on imports from China. All other countries together exported only around half as much to Russia as China on a monthly average and their exports were below the total value by which the sanctioning countries reduced their deliveries to Russia after the start of the war. The most important supplier country to China, which has not imposed sanctions, is Turkey with monthly exports of around EUR 1 billion.

Figure 4: Exports from non-sanctioning countries to Russia, Jan 2021- July 2023, index (Jan 2021=100)



Source: Own calculation according to Trade Map of the International Trade Center (ITC)

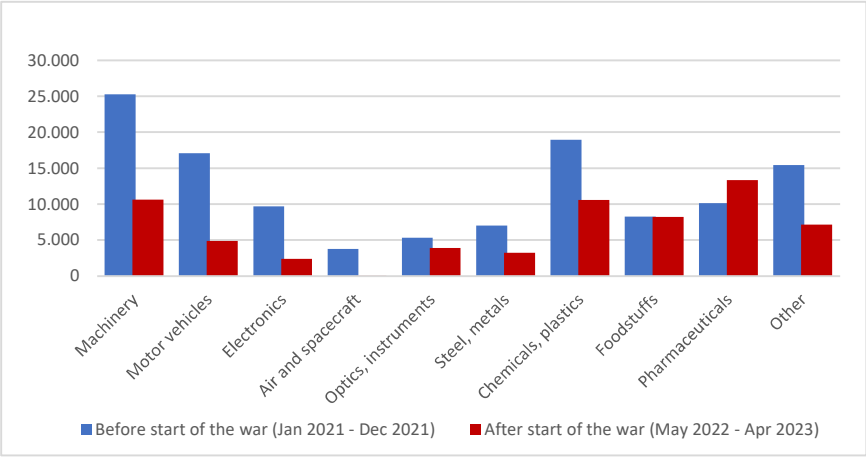
Among Russia's most important trading partners that are not participating in the sanctions, Turkey increased its exports particularly strongly. Immediately after the start of the war, these quadrupled within just six months, while exports from China to Russia "only" doubled. Machinery and electrical products, plastics, chemical products, steel and metal products, clothing and foodstuffs were the main contributors to this growth. Serbia's exports to Russia have also doubled since 2021, while India has only seen a moderate increase. By contrast, Hong Kong, which is often suspected of acting as a hub for sanctions evasion,[18] even recorded a sharp decline immediately after the start of the war and

[18] Kot, Brian Chun Hey (2023): Hong Kong's Technology Lifeline to Russia. Carnegie Endowment for International Peace. May 17, 2023; Nikkei Asia (2023), Special Report: How U.S. made chips are flowing into Russia. April 21, 2023.
Nikkei Asia (2023), Special Report: How U.S. made chips are flowing into Russia. April 21, 2023.
https://carnegieendowment.org/2023/05/17/hong-kong-s-technology-lifeline-to-russia-pub-89775
https://asia.nikkei.com/Business/Business-Spotlight/How-business-friendly-Hong-Kong-became-a-hub-of-Russian-chip-trade

only just raised exports to Russia back to the starting level of early 2021 by the beginning of 2023. Hong Kong had been an important supplier to Russia, especially of electronic products, for some time before the war, but did not increase its deliveries after the war began.

Of the other major emerging economies, only Brazil increased its exports to Russia to any significant extent. However, these consisted mainly of agricultural products such as soy, meat and sugar and were therefore of no great significance to Russia's wartime strength. Southeast Asian countries such as Thailand and Malaysia reduced their deliveries, although they did not impose sanctions on Russia.

Figure 5: Exports to Russia from sanctioning countries by product group in million EUR, before and after the start of the war

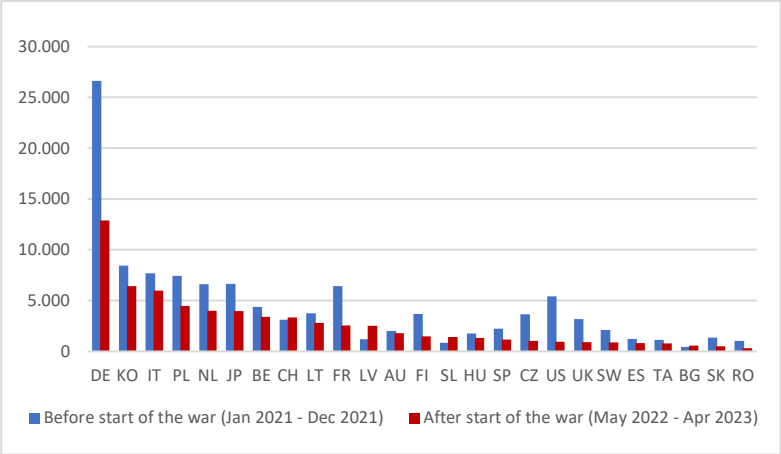


Source: Trade Map of the International Trade Center (ITC)

The decline in exports to Russia from countries participating in the sanctions is concentrated on a limited number of products and product groups, as Figure 5 shows with a comparison of 2021 with the period May 2022 to April 2023. They were particularly strong for machinery (from EUR 25 to 11 billion), road vehicles and parts (from 17 to 5 billion EUR), electrical engineering (from EUR 10 to 2 billion) and aircraft and spacecraft including parts (from EUR 4 to 0 billion). Exports of these four product groups together fell from EUR 56 to 18 billion, i.e. to less than a third of their pre-war level. By contrast, agricultural products and foodstuffs, which are exempt from the sanctions, remained unchanged, while deliveries of pharmaceuticals even increased noticeably from a total of EUR 10 billion in 2021 to EUR 13 billion. Since the products that are particularly important for warfare are predominantly found in product groups with sharp declines in exports, the first finding is that the export restrictions and bans were largely complied with by the Western industrialized countries. However, there have still been deliveries that need to be viewed critically.

Germany was the largest supplier country to Russia among the Western sanctioning countries before and after the start of the war. However, with a decline of 14 billion EUR, it alone also accounted for a quarter of the total decline of 56 billion EUR. This corresponds to a share of around 1% of total German exports and 0.4% of German GDP. In relative terms, the decline in exports from the USA, the UK, the Czech Republic, Finland, and Sweden was particularly sharp. In contrast, Russia's most important suppliers after Germany from the group of western industrialized countries (Korea, Italy, Poland, the Netherlands, and Japan) reduced their deliveries less severely. Four countries even increased their deliveries: Switzerland, Latvia, Slovenia, and Bulgaria.

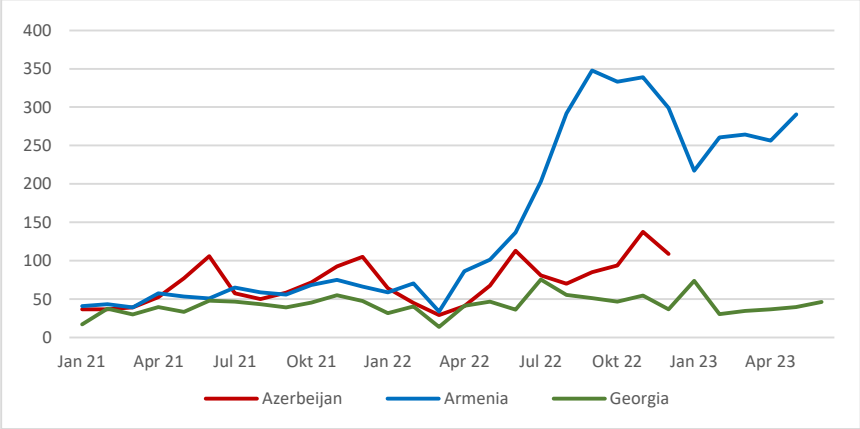
Figure 6: Russia exports of the sanctioning countries in million EUR, before and after the start of the war



Source: Trade Map of the International Trade Center (ITC)

The differences between the countries result not only from the varying degrees of strictness with which the sanctions were implemented, but also from their export structure. For example, more than half of Switzerland's deliveries to Russia consist of pharmaceuticals, which are exempt from the sanctions and were able to increase as a result. In contrast, exports of other products from Switzerland also fell. The increase in deliveries from Bulgaria can also be explained by a high proportion of pharmaceutical products. The increase in exports from Latvia to Russia is remarkable, as are the only very moderate declines from Lithuania and Estonia, the other two Baltic countries, because they always demand particularly strict sanctions against Russia. They have long since developed into a hub for trade between the EU and Russia for some products and have maintained this role even after the Russian full-scale war against Ukraine. For example, one third of Latvia's exports to Russia are alcoholic beverages, including wine and sparkling wine, which are sold from other EU countries to Russia via Latvia due to apparently lax export controls on luxury goods.[19] Alcoholic beverages have also become the top Lithuanian export goods to Russia with considerable growth, followed by perfumery products.

Figure 7: Exports of the Caucasus countries to Russia in million EUR, Jan 2021 - April 2023



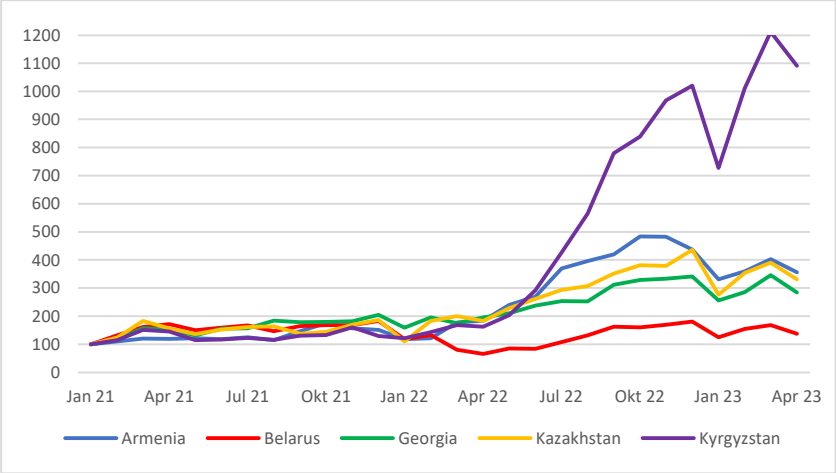
Source: Trade Map of the International Trade Center (ITC)

[19] „European Wine Exports to Russia Grow“, Wine-Searcher, 13-Feb-2023. https://www.wine-searcher.com/m/2023/02/european-wine-exports-to-russia-grow#:~:text=According%20to%20the%20European%20Commission,%E2%82%AC89m%20during%20November%202021.

Of particular interest are the former Soviet republics of the Caucasus and Central Asia, which, due to their close economic ties with Russia via the Eurasian Economic Union, are preferred third countries for circumventing export sanctions. Of these, only Armenia publishes current monthly trade data, as well as Georgia, which continues to have close economic ties with Russia despite difficult political relations. The development of their exports and those of Azerbaijan, which keeps its distance from Russia both politically and economically, since the beginning of 2021 are shown in Figure 7. Armenia increased its deliveries by a factor of five to seven immediately after the start of the war. This growth clearly points to detour deliveries to circumvent the sanctions, as small Armenia is not in a position to deliver goods from its own production to Russia on this scale in such a short time. Azerbaijan's exports have also increased, but by no means to a comparable extent, while deliveries from Georgia have not changed significantly.

Even more revealing for the question of circumvention are the deliveries from the sanctioning countries to the countries of the Eurasian Economic Union and Georgia. They are shown in Figure 8 as an index due to the unequal starting levels, with January 2021 = 100. Small and poor Kyrgyzstan stands out here with a tenfold increase within six months. It is inconceivable that Kyrgyzstan's own demand can explain this increase; it is only plausible as a detour delivery to Russia. The five-fold increase in exports to Armenia corresponds to its export growth to Russia, which must also be interpreted as clear evidence of detour deliveries. Exports from the sanctioning countries to Kazakhstan have grown almost as strongly, as have those to Georgia. Obviously, the goods destined for forwarding to Russia via Georgia are being delivered past the customs authorities, possibly via the two Georgian provinces occupied by Russia. Exports to Belarus, on the other hand, initially fell by around half because it was itself subject to sanctions due to its support for Russia in the war against Ukraine. However, they rose again in the course of 2022 to a higher level than in the previous year.

Figure 8: Exports of sanctioning countries to the Eurasian Economic Union and Georgia, index (Jan 2021=100), Jan 2021-July 2023



Source: Trade Map of the International Trade Center (ITC)

Overall, exports from all sanctioning countries combined to Russia's five neighboring countries grew from EUR 21.8 billion in 2021 to EUR 37.6 billion in the period from May 2022 to April 2023. If this growth stems entirely from detour deliveries to Russia, almost EUR 16 billion would have to be added to Russian imports, which is around 7-8% of total Russian imports. This is not an insignificant figure, but it is also not so high that Russian foreign trade would have to be reinterpreted as a result.

However, the peculiar increase in both deliveries from the sanctioning countries to Russia's neighboring countries and their deliveries to Russia is sufficient reason to include them in the following product-specific analysis.

An interim conclusion shows that the sanctions following Russia's military attack on Ukraine have led to a conspicuous break in its foreign trade relations. Exports from the sanctioning countries to Russia fell abruptly and have since been below half their pre-war level. China was able to compensate for part of this decline, but it took several months to regain and exceed its previous export volume. The only other notable increase in deliveries to Russia has been in Turkey. There are also strong indications of sanctions being circumvented via Russia's neighboring countries, which are part of the Eurasian Economic Union. However, these can only compensate for the reduced deliveries from the sanctioning countries to a limited extent. Russia is becoming more and more economically dependent on its large neighbor China.

However, whether the sanctions have been able to weaken Russia's ability to wage war in the long term can only be reviewes by a detailed analysis of the changes in Russian trade relations for war-related products.

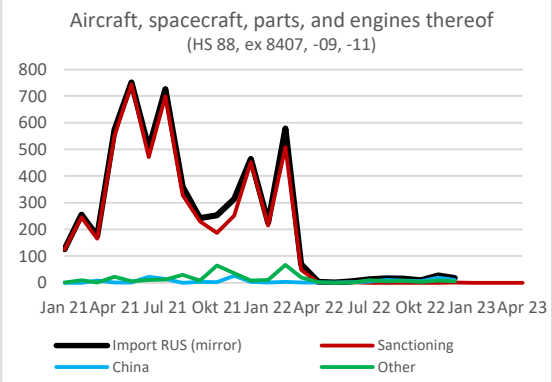
Supply embargo on war-related goods: success or failure?

The success of the sanctions depends crucially on whether Russia still had access to products after the start of the war that it needed for the manufacture of its armaments and for maintaining the infrastructure important for waging war and that it could not manufacture itself. These products primarily include high-quality electronics, machinery for the manufacture of tanks and missiles as well as aircraft and transport vehicles that support military logistics. Russia has not been receiving military equipment in the narrower sense from Western countries for some time now. It largely must produce these itself, apart from the drones it obtains from Iran and the ammunition it recently ordered from North Korea.

Even if China and other countries have increased their overall deliveries to Russia, this will only benefit the Russian war effort if they supply the goods affected by sanctions in sufficient quantity and quality to avoid shortages in the product groups mentioned. Moreover, the high consumption of war material has created additional demand, which necessitates additional production capacities and deliveries of primary products and machinery from China and other allied countries.

To this end, the changes in deliveries to Russia for selected war-related products and product groups are analyzed in detail. As in the previous analysis, deliveries from all over the world to Russia are used on a monthly basis since January 2021 (again, only for countries that report monthly data). The sanctions can always be assumed to have been successful if, firstly, the sanctioning countries stopped all or most of their deliveries to Russia after the start of the war and, secondly, if other countries were unable to close the resulting supply gap. In the following figures, Russian imports, expressed as the sum of exports from all countries (mirror data) with monthly publications, are represented by a black line, deliveries from the 40 countries with sanction decisions by a red line, deliveries from China by a blue line and those from other countries without sanctions by a green line.

Figure 9: Exports of aircraft and spacecraft, aircraft engines to Russia, in million EUR, Jan 2021 - April 2023



Source: Trade Map of the International Trade Center (ITC)

The sanctions have probably had the clearest impact on aircraft and spacecraft, including aircraft engines and related spare and supplier parts. Before the war Russia imported around half a billion EUR worth of aircraft and aircraft parts every month. These came almost exclusively from countries that had imposed sanctions, as the fact that the black line for Russian imports largely coincided with the red line for deliveries from the sanctioning countries until the start of the war shows. These countries have completely stopped their exports and no other country has been able to deliver as a substitute. Russia has received virtually no aircraft, spacecraft, or spare parts from abroad since the start of the war, which is shown in the chart by the fact that the black and red lines are close to zero since the start of the war.

Russia also has its own aerospace industry to equip its air force and the Russian space program. But almost the entire Russian civil aviation fleet consists of Boeing and Airbus aircraft, for which it needs spare parts from the West. In Soviet times, Russia also manufactured passenger aircraft itself and a few years ago it tried to resume production, but with parts from the West, so that these plans have become obsolete. Although China is striving to build passenger aircraft, it has not yet reached the point where it can replace European and American aircraft.

Figure 9 is likely to underestimate the delivery shortfall for passenger aircraft, as it does not include leased aircraft and many these have already been confiscated abroad due to the termination of leasing contracts.[20] However, this does not encompass drones from Iran, which are not included in the international trade data because Iran, like Russia, does not publish current monthly figures.

As long as Russia still has a sufficiently large number of aircraft, which can have a service life of 30 years or more if well maintained, it can cope with not buying new aircraft. However, bottlenecks very quickly become noticeable with spare parts, which are essential for safety but are difficult to copy due to their technical complexity. Russia is now cannibalizing decommissioned machines to cover the demand for spare parts. The violation of safety regulations makes it difficult or even impossible to fly to foreign destinations. According to press reports, Russia is now also having aircraft serviced in Iran, which is familiar with makeshift repairs due to its own experience with sanctions.[21]

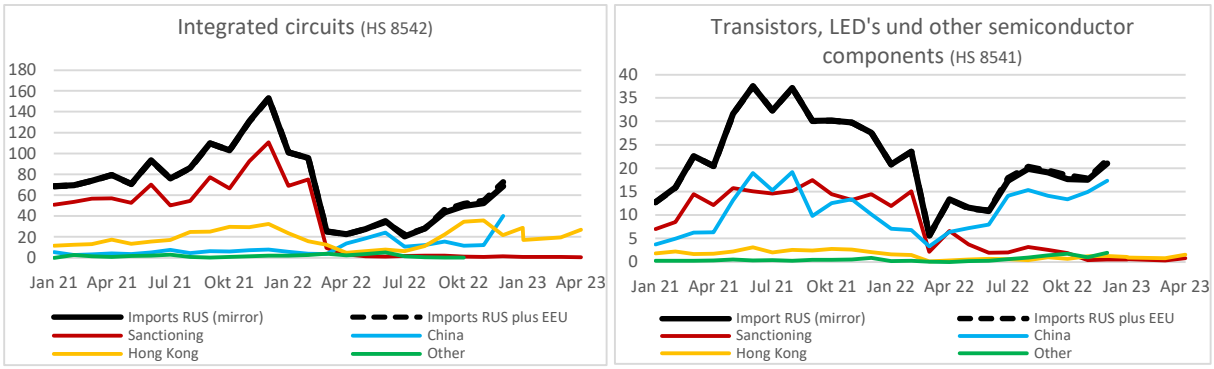
[20] „Wartung und drohende Enteignung – die Russland-Sorgen der Leasinggeber“, airliners.de, 16. März 2022. https://www.airliners.de/wartung-drohende-enteignung-russland-sorgen-leasinggeber/64125

[21] „How Russia is evading sanctions to keep $10 billion worth of seized Boeing and Airbus planes flying“, Business Insider, July 31, 2023. https://www.businessinsider.com/how-russia-keeping-western-built-airbus-boeing-planes-flying-sanctions-2023-7

The loss of aircraft deliveries and, above all, the lack of spare parts is causing serious problems for Russian aviation. As the largest country in the world, Russia is more dependent on air transport than almost any other country, including for military logistics. Safety deficiencies will increase and the operational aircraft fleet will shrink, so it is only a matter of time before the supply bottlenecks turn into serious difficulties.

Aircraft and spacecraft are a textbook example of the effectiveness of sanctions. The market is dominated by a few large manufacturers based in Western countries. There is great market transparency. Russia alone is not economically strong enough and does not have the economies of scale for a domestic aircraft industry. However, the sanctions will take some time to take full effect.

Figure 10: Exports of integrated circuits and other semiconductor components to Russia, in million EUR, Jan 2021 - April 2023



Source: Trade Map of the International Trade Center (ITC)

Integrated circuits are indispensable components for defense production. The accuracy, performance and reliability of missiles and other weapons systems depend on their quality, and they can decide wars. It is therefore only logical that integrated circuits and other semiconductors are covered by the sanctions as dual-use goods. Investigations into missiles and drones fired at Ukraine have shown that they contain a significant number of semiconductors from Western manufacturers.[22] This means, firstly, that Russia is dependent on semiconductors from Western manufacturers for its arms production and, secondly, that there must be ways for these to reach Russia. During the technical examinations of the weapons that were shot down, the age of the semiconductors could not be clarified in most cases, meaning that the semiconductors found could have been delivered to Russia before the sanctions were imposed. In this context, it is noteworthy that deliveries of high-quality semiconductors in particular skyrocketed at the end of 2021 (see Figure 10), so it can be assumed that Russia quickly stockpiled larger quantities in anticipation of tighter sanctions before the start of the war.

With a share of around 1% of global imports of integrated circuits, Russia is not a particularly significant importer, as it produces comparatively few electronic and other industrial products with a high semiconductor content. However, Russia's defense production depends on them and is being hit hard by the supply boycott. Before the war began, Russia imported three quarters of its semiconductors from sanctioning countries, primarily from the Netherlands, the Czech Republic, Germany, South Korea, the US and Singapore. When the sanctions were imposed, these countries

[22] Byrne, James, Gary Summerville, Jack Watling, Nick Reynolds, Jane Baker (2022): Silicon Lifeline. Western Electronics at the Heart of Russia's War Machine, RUSI August 2022. https://static.rusi.org/RUSI-Silicon-Lifeline-final-updated-web_1.pdf

almost completely stopped their deliveries. Hong Kong was the only country without a sanctions resolution that also supplied Russia with integrated circuits on a large scale, but also initially stopped deliveries almost completely at the start of the war and only resumed them in the second half of 2022, but without expanding the delivery volumes. For a long time, China only had a small share of Russian imports, but increased deliveries considerably by the end of 2022.

In contrast to other high-tech sectors, China has not yet caught up with the world's leading producers in semiconductor technology. Most of the integrated circuits manufactured in China come from production facilities of American, Korean, Taiwanese, and Japanese manufacturers, which are also subject to sanctions. Chinese manufacturers often produce under their licenses or contract and are therefore also bound by the sanctions regulations. This leaves the semiconductors developed by Chinese manufacturers themselves, whose performance, however, lags well behind that of the leading Western companies. This is where Chris Miller's widely acclaimed book on the global semiconductor industry comes into play:[23] The rapid development of semiconductors, with performance doubling every one to two years according to Moore's Law, means that only a small number of producers can keep up with the global leaders. Due to the extremely high development and production costs, these manufacturers are increasingly specializing in either chip design or production, so that even Intel, the world's largest integrated chip manufacturer, is struggling to keep up with the competition. Another prerequisite for a leading position is access to the world's most powerful semiconductor production machines, which are also subject to sanctions. The Dutch company ASML has a de facto monopoly on these and they are also not sold to Chinese companies. So even if Russia has recently received more microchips from China, it must be assumed that these are not a fully-fledged replacement for semiconductors produced in the West.

Whether the increase in deliveries of integrated circuits from China at the end of 2022 was just a one-off effect or indicates the end of the sanctions-related supply shortfall cannot yet be definitively assessed. However, it is worth noting that the decline in deliveries of high-quality integrated circuits in the HS 8542 product group was more pronounced after the start of the war and lasted longer than for simple semiconductor components such as transistors and LEDs (HS 8541). Russia had already covered half of its import requirements for these from China before the start of the war. As China has always been able to supply them in full, the sanctions imposed by Western industrialized countries are having no effect here, unlike in the case of high-quality integrated circuits. For the latter, the export embargo is causing or has already caused a supply shortage in Russia once stocks have been used up, which cannot be fully eliminated by supplies from Hong Kong and China. As the title of Chris Miller's book suggests, the availability of the most powerful chips has become as important a factor for political and military strength as oil. Russia has lost out to Western countries in this respect and is suffering from the sanctions.

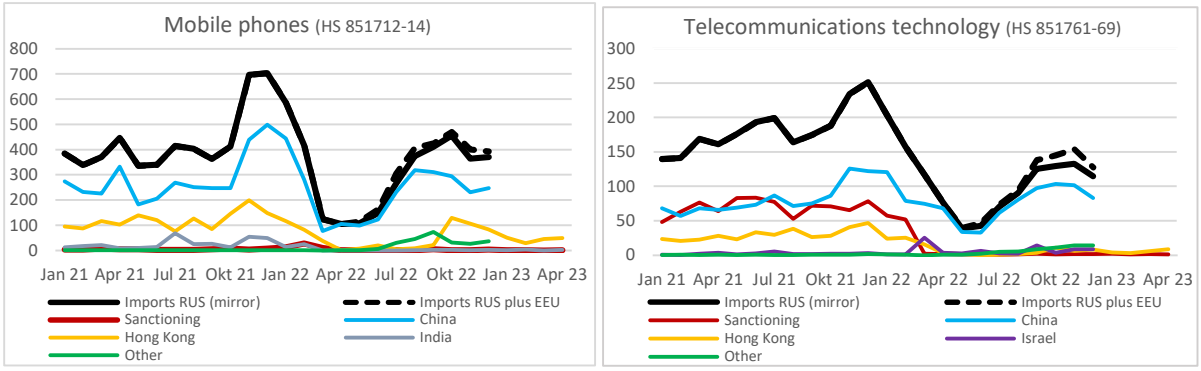
Semiconductors are also the focus of reports on detour deliveries via the neighboring countries of the Eurasian Economic Union. The dashed black lines in Figure 10 indicate the supply volumes available to Russia if the increased exports from the sanctioning countries to the countries of the Eurasian Economic Union compared to 2021 are only disguised deliveries with Russia as the destination and expand supply in Russia accordingly. For integrated circuits and other semiconductor components, this only has a very small effect.

The proportion of smuggled goods is probably higher for semiconductors than for large-volume goods due to their small size and low weight. A report in the Financial Times describes illegal trade routes for semiconductors from France and Ireland to Russia, bypassing customs controls via Serbia, the

[23] Miller, Chris (2022): Chip War. The Fight for the World's Most Critical Technology. London et al. 2022.

United Arab Emirates and China, which were set up by Russian front companies.[24] However, even these deliveries, which are not included in the trade statistics, can only compensate for Russia's shortage of high-quality semiconductors to a very limited extent.

Figure 11: Exports of mobile phones and telecommunications technology to Russia, in million EUR, Jan 2021 - April 2023



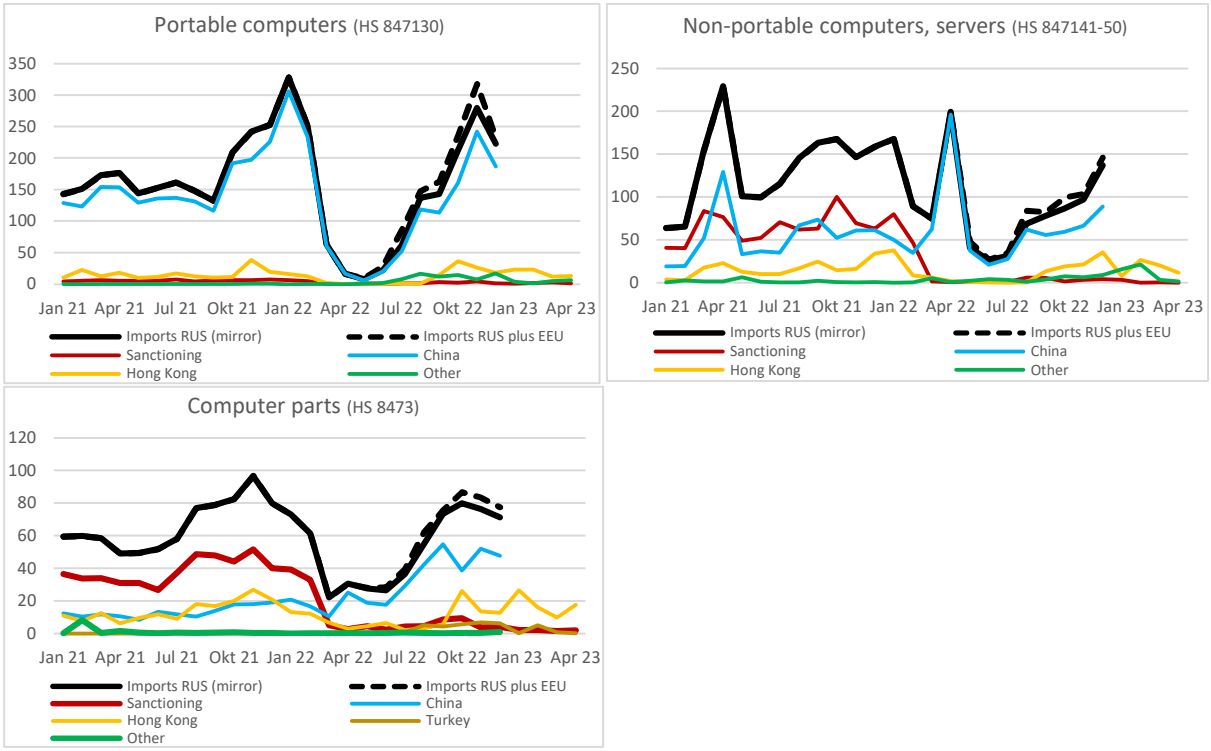
Source: Trade Map of the International Trade Center (ITC)

As with simple semiconductor components, Western industrialized countries have little opportunity to exert pressure on Russia through sanctions for mobile phones, as it was already sourcing these predominantly from China and Hong Kong before the start of the war. After a remarkable surge towards the end of 2021, deliveries fell sharply in the weeks following the start of the war but recovered very quickly and stabilized at pre-war levels at the end of 2022. The slowdown is likely due to Western cell phone manufacturers such as Apple and Samsung, which served the Russian market from China and stopped their deliveries completely after the start of the war. Their market shares were taken over by original Chinese manufacturers, who, however, needed a few weeks to set up a sales and logistics infrastructure. In addition to China, Hong Kong is also an important supplier of cell phones to Russia, but temporarily suspended deliveries and has not yet returned to pre-war levels. Vietnam is another important supplier of mobile phones to Russia, but no current monthly foreign trade data are available for this country.

The situation is slightly different for telecommunications and network technology, which is of military importance. After a continuous increase in Russian imports in 2021, there was a sharp drop to just one-sixth of the previous year's level in early summer 2022. While exports from China remained largely stable, the sanctioning countries and Hong Kong, which together accounted for around two thirds of Russian imports before the war, stopped supplying Russia altogether. China has not yet been able to make up for this shortfall, meaning that Russia is suffering severe shortages. It is not yet possible to estimate whether Chinese suppliers will be able to fill this gap in the future. In the case of telecommunications technology and, to a lesser extent, mobile phones, there are likely to have been bypass deliveries via neighboring former Soviet republics, but these can only compensate for the loss of deliveries from sanctioning countries to a limited extent.

[24] „The Shadowy Network Smuggling European Microchips into Russia“, Financial Times, 12.11.2023.

Figure 12: Exports of computers and computer parts to Russia, in million EUR, Jan 2021 - April 2023



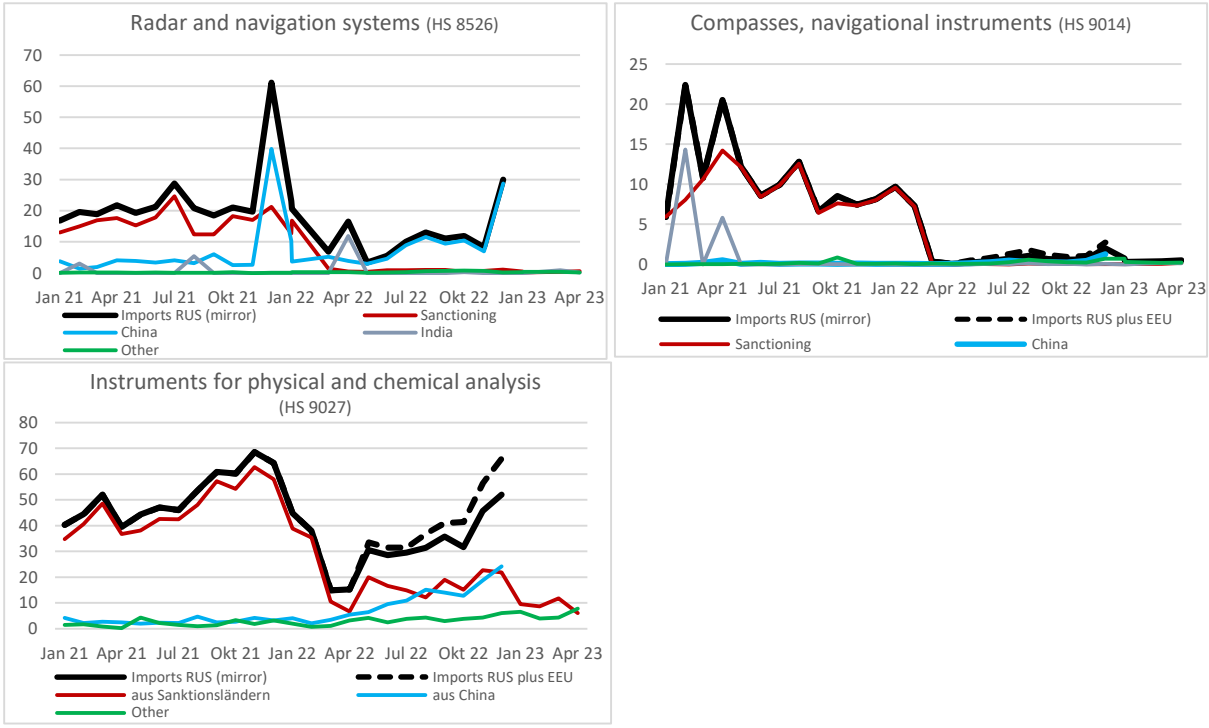
Source: Trade Map of the International Trade Center (ITC)

The situation for computers is similar to that for telecommunications equipment. The supply of mass products such as laptops and tablets has recovered quickly after a dramatic slump at the start of the war. Russia sources laptops and tablets almost exclusively from China, and to a lesser extent from Vietnam. The West has little opportunity to damage Russia through sanctions.

The situation is somewhat different for mainframe computers, servers, and computer parts. Before the war, Russia sourced around half of these from countries that had imposed sanctions, primarily Poland, the Czech Republic, Taiwan, and the Netherlands. They almost completely stopped supplying Russia. On the other hand, deliveries from China, Hong Kong and, in the case of computer parts, also from Turkey increased, so that the decline due to the sanctions was almost offset, at least for computer parts and input/output devices. The only gap remains in the more complex mainframe and server technology. There also appears to have been a moderate amount of circumvention trade in computers and computer parts via the former Soviet republics in the Caucasus and Central Asia.

In the field of computer technology, the Western industrialized countries were therefore only able to inflict limited damage on Russia by stopping deliveries of servers and mainframes. However, if one assumes that there is an additional demand for the war economy, there is still a gap here that Russia has not yet been able to close.

Figure 13: Exports of radar and navigation systems, compasses, and chemical-physical analysis instruments to Russia, in million EUR, Jan 2021 - April 2023



Source: Trade Map of the International Trade Center (ITC)

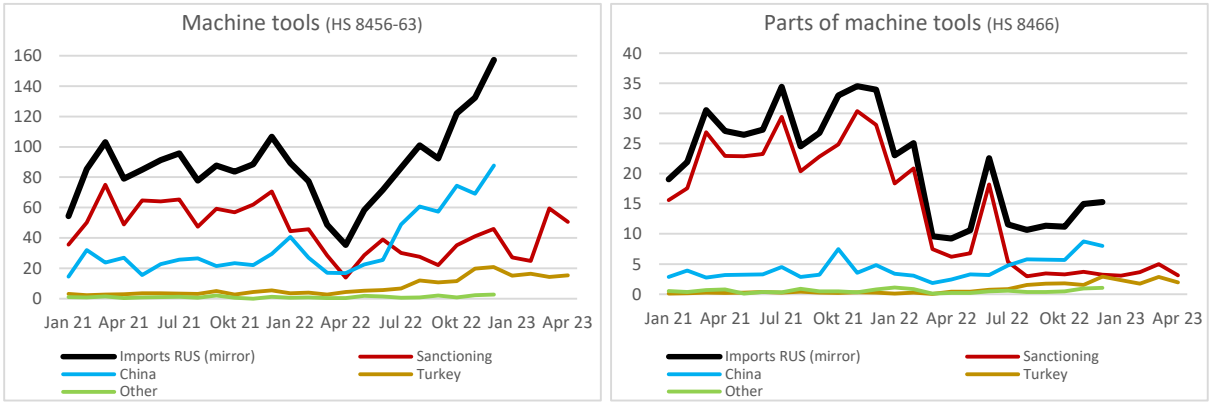
One product group that is of no small importance for the effectiveness of sanctions but is often underestimated or overlooked due to its low market volume, is measurement instruments. Here are three examples from this heterogeneous group that are important for warfare: Radar and navigation systems, compasses, and instruments für physical and chemical analysis. The first two support the control of missiles, air traffic and space exploration, while chemical-physical analysis instruments are required for the development of munitions, among other things.

The impact of the sanctions on compasses is similar to that on aircraft and spacecraft. Before the war began, Russia sourced these almost exclusively from sanctioning countries, primarily France and Germany. Since the beginning of the war, Russia has had to forgo such devices completely or rely on domestic production. The sanctions are therefore highly effective here.

The situation is slightly different for radar and navigational systems. While sales from the sanctioning countries have been cut back completely, China has stepped in without completely replacing the lost deliveries. It is also difficult to assess whether the Chinese products are of comparable quality.

In the case of instruments for physical and chemical analysis such as microtomes and spectrometers, it can be seen that deliveries from Western countries to Russia have continued despite sanctions, albeit at a lower level than before the war. These came mainly from Germany, the Netherlands, Poland, Italy, and Finland. Even if such products are used for civilian scientific and technical purposes, their use for arms production cannot be ruled out. There is therefore a need to tighten up the sanctions provisions here. In this product group, there has also been a sharp increase in deliveries to the countries of the Caucasus and Central Asia, which reinforces the assumption that these are indeed militarily relevant products whose supply routes are concealed.

Figure 14: Exports of machine tools and parts to Russia, in million EUR, Jan 2021 - April 2023



Source: Trade Map of the International Trade Center (ITC)

Machine tools are of central importance to produce tanks and missiles, so they are logically covered by the sanctions. According to press reports, Russia has doubled its annual tank production and significantly expanded the production of missiles and combat aircraft.[25] This creates a high additional demand for machine tools, which are a vulnerable product of the Russian war economy. Before the war began, three quarters of all machine tools imported by Russia came from sanctioning countries, mostly from Germany. Their share of spare parts was even higher. In contrast to other sanctioned product groups, however, deliveries from the sanctioning countries to Russia fell only moderately, but more sharply for spare parts than for new machines.

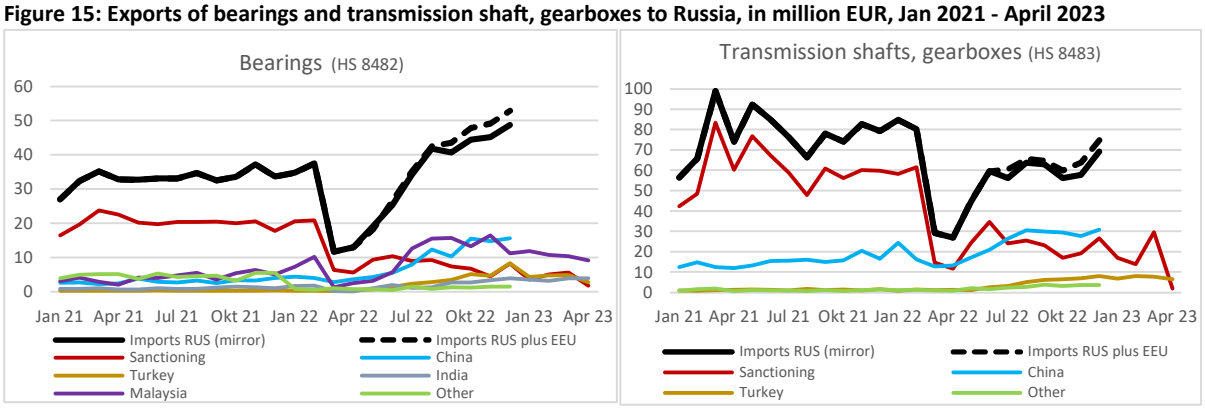
To cover its additional demand, Russia multiplied machine tool imports from China and Turkey. As a result, Russian imports increased continuously from the start of the war until the end of 2022, reaching around twice the average volume of 2021 by the end of 2022. This was also assisted by continued deliveries on a considerable scale from sanctioning countries, especially Taiwan, South Korea and Italy, which hardly restricted their deliveries at all. Germany, on the other hand, has largely reduced its exports of machine tools, although it has not stopped them completely.

The Russian economy is more likely to suffer from a delivery stop for machine tools in the medium to long term, as these are very durable capital goods, and because China and Turkey can partially cover Russia's demand. However, a lack of spare parts can lead to production stoppages in existing machinery. The sanctions take effect much faster for these than for new machines. A consistent export ban is therefore even more important for them than for new equipment. Apart from a one-off higher delivery from Germany in June 2022, which may still be based on an old contract concluded before the start of the war, the sanctions on spare parts are now also largely being complied with.

The sanctions regulations for machine tools are sufficiently strict and clear, at least in the EU, but there are apparently problems with enforcement in some countries. In South Korea and Taiwan, the continuation of exports could also be due to less clear laws. This should be a reason for better international coordination of sanctions. Machine tools have a potential to damage the Russian defense industry that is not yet fully exploited.

[25] „Russland baut immer mehr Panzer“, Frankfurter Allgemeine Zeitung, 30.09.2023. https://www.faz.net/aktuell/politik/ausland/russland-baut-immer-mehr-panzer-raketenproduktion-hat-sich-verdoppelt-19210742.html

Figure 15: Exports of bearings and transmission shaft, gearboxes to Russia, in million EUR, Jan 2021 - April 2023

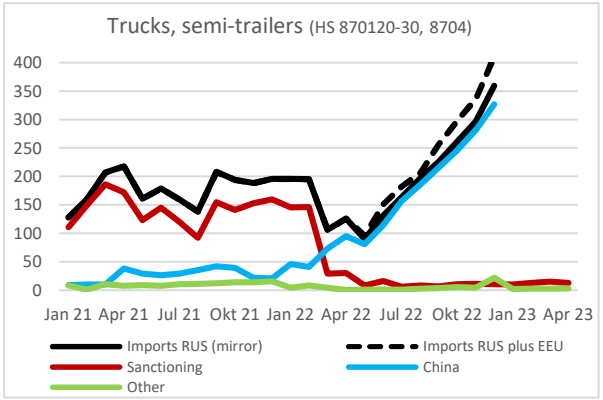


Source: Trade Map of the International Trade Center (ITC)

The situation for bearings and gearboxes is similar to that for machine tools. These are important components for tanks, vehicles and machinery and are therefore also covered by the sanctions. For both product groups, deliveries from the sanctioning countries also fell sharply after the start of the war, but not to zero. Considerable exports of transmission shafts and gearboxes in particular continued to be made to Russia, especially from Germany, Japan, Italy and Austria. China was only able to expand its exports of transmission shafts and gearboxes to Russia to a limited extent, and there were also higher deliveries from Turkey. Russian imports were still well below the 2021 level at the end of 2022, but strict compliance with the sanctions would have exacerbated the bottleneck.

For rolling bearings, Russia can rely on suppliers other than China, which have either started exporting to Russia for the first time or significantly increased their exports. At times, Malaysia was the largest supplier, but Turkey and India have also delivered significantly more to Russia. There are also bypass deliveries via the countries of the Caucasus and Central Asia. With so many suppliers, sanction measures are more difficult, but they should not be dispensed with.

Figure 16: Exports of trucks and semi-trailers to Russia, in million EUR, Jan 2021 - April 2023



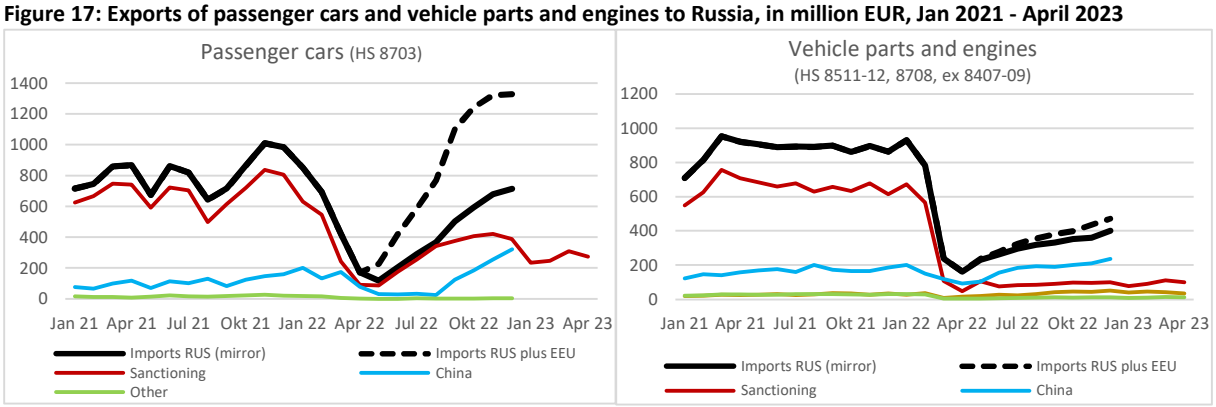
Source: Trade Map of the International Trade Center (ITC)

Trucks are of central importance for military logistics. Before the war, Russia sourced most of these from sanctioning countries, primarily Japan, Poland, the US, and Germany, unless it produced them domestically. These almost completely stopped their deliveries after the start of the war. Instead, deliveries from China soared. Russia now obtains almost all its trucks from there, with detour deliveries via the countries of the Caucasus and Central Asia. What's more, China was not only able to

replace the deliveries lost due to sanctions, but also to satisfy Russia's considerable additional demand.

Trucks and semi-trailers are essential war products for which the sanctions imposed were strictly adhered to, but without causing major damage to Russia because China overcompensated for the loss.

Figure 17: Exports of passenger cars and vehicle parts and engines to Russia, in million EUR, Jan 2021 - April 2023



Source: Trade Map of the International Trade Center (ITC)

The war has brought about some very peculiar changes in the passenger car market, which often lead to misleading interpretations. The export of cars is not generally prohibited by the sanctions, but they may only no longer be sold to Russia if they are worth more than 50,000 EUR and are therefore considered luxury goods. However, as all Western car manufacturers have shut down their Russian production sites and discontinued their sales and service network, hardly any new cars from Western brand manufacturers are still available on the Russian market. In Russia, only domestic companies produce technically outdated models (for example without ABS and airbags) because they can no longer obtain the high-quality parts they need from the West and are unable to produce them domestically. Russian car production has shrunk to just 30% of its pre-war level. This can also be seen in the Russian import figures for car parts and engines, which have fallen to just a third of their pre-war level.

The Russian automotive market was thus affected by the sanctions in two ways: by the collapse of domestic production and by the almost complete loss of imports. This resulted in three different reactions. The least surprising was that, firstly, Chinese car manufacturers began supplying the Russian market. Before the war, they had hardly been represented there. They needed a lead time of around six months to set up sales and logistics. In addition, their range is far from sufficient to completely replace the loss of the European, American, Japanese, and Korean brands and they still lack an efficient service network.

Secondly, there was a lively upturn in used car deliveries from Western countries to Russia. As Figure 17 shows, car deliveries from the sanctioning countries rose noticeably again in fall 2022, albeit nowhere near the pre-war level. However, Table 1 shows that these deliveries from the sanctioning countries consisted mainly of used vehicles, which were not very important before the war. The Trade Map foreign trade data make it possible to differentiate between new and used vehicles for most countries. Of the EUR 3.5 billion in car deliveries that Russia received from the sanctioning countries in the first year after the start of the war (May 2022 to April 2023), more than half (EUR 2.1 billion) came from Japan. More than 95% of these were used cars. A good €800 million more came from South Korea, which, however, does not distinguish between new and used vehicles in its foreign trade

data. Around 400 million EUR worth of vehicles were delivered from Germany, over 90% of which were used vehicles.

Table 1: Exports of new and used passenger cars (HS 8703) from sanctioning countries to Russia, Belarus, Armenia, Georgia, Kazakhstan and Kyrgyzstan in billion EUR, 2021 and May 2022 to April 2023

		Russia		Belarus		Armenia		Georgia		Kazakhstan		Kyrgyzstan	
		01/21-12/21	05/22-04/23	01/21-12/21	05/22-04/23	01/21-12/21	05/22-04/23	01/21-12/21	05/22-04/23	01/21-12/21	05/22-04/23	01/21-12/21	05/22-04/23
Germany	total	1,862	408	119	901	9	130	29	195	41	466	3	256
	new	1,791	28	47	162	8	66	16	86	38	255	2	136
	used	71	379	72	739	1	64	13	109	3	211	1	120
Poland	total	14	15	37	381	0	4	4	11	0	13	0	17
	new	12	2	18	65	0	1	1	2	0	3	0	7
	used	2	13	19	316	0	3	3	9	0	10	0	10
Lithuania	total	5	45	170	808	0	11	1	16	1	46	1	68
	new	2	5	28	142	0	5	0	5	0	24	0	30
	used	3	40	142	665	0	6	1	11	1	22	1	38
Slovakia	total	653	33	0	1	0	1	10	32	33	37	0	1
	new	653	33	0	0	0	1	10	32	37	37	0	0
	used	0	0	0	1	0	0	0	0	0	0	0	0
Other EU	total	503	44	2	48	4	27	32	107	9	56	0	29
	new	.	.	.	.	.	.	.	.	.	.	.	.
	used	.	.	.	.	.	.	.	.	.	.	.	.
US	total	255	0	44	0	6	81	341	1,197	17	32	2	13
	new	249	0	38	0	5	65	29	83	15	26	2	9
	used	6	0	6	0	1	16	312	1,114	2	6	0	4
Japan	total	2,421	2,147	0	0	0	3	119	316	177	498	0	0
	new	1,709	84	0	0	0	0	102	288	177	498	0	0
	used	712	2,063	0	0	0	3	17	28	0	0	0	0
South Korea	total	2,160	810	9	1	7	14	16	60	359	1,251	14	429
	new	.	.	.	.	.	.	.	.	.	.	.	.
	used	.	.	.	.	.	.	.	.	.	.	.	.
All Sanctioning	total	8,274	3,514	387	2.146	27	279	575	2,013	610	2,420	21	817
	new	.	.	.	.	.	.	.	.	.	.	.	.
	used	.	.	.	.	.	.	.	.	.	.	.	.

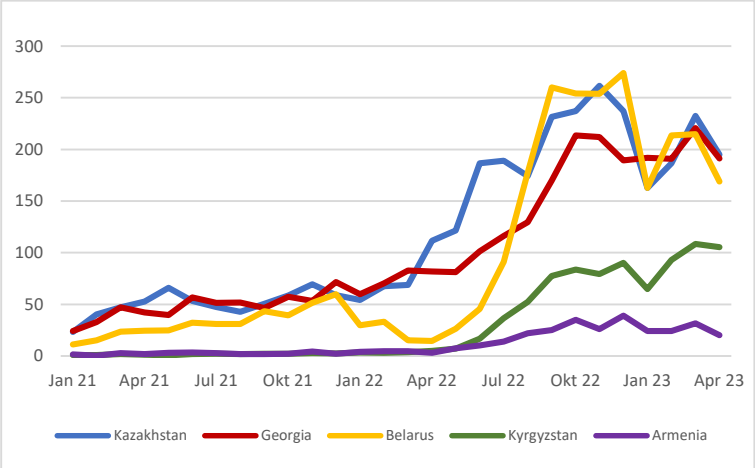
Source: Trade Map des International Trade Center (ITC)

Closely linked to the emergence of this new type of used vehicle trade with Russia is the detour trade via the member states of the Eurasian Economic Union and Georgia as a third reaction variant following the collapse of vehicle exports to Russia. As Figure 18 shows, deliveries from the sanctioning countries to all of Russia's five neighboring countries suddenly skyrocketed after the start of the war. Kazakhstan, Belarus, and Georgia account for the largest share, but the growth rates are even higher for Armenia and Kyrgyzstan due to a very low starting point.

Such growth cannot be explained by an increase in domestic demand. The timing of the increase a few weeks after the start of the war also makes it sufficiently clear that these deliveries could only have been destined for the Russian market. Table 1 shows that the supply channels are very different and that not only used but also new vehicles are traded through them. It is remarkable that Belarus plays a prominent role here, even though it is itself subject to sanctions as an ally of Russia. What is even more remarkable is that its immediate EU neighbors Lithuania and Poland supply large quantities of vehicles to Belarus and significantly increased their volumes after the start of the war, even though they are particularly antagonistic towards their neighbor. Lithuania, which does not have an own automotive industry, supplies the most vehicles to Belarus, Kazakhstan and Kyrgyzstan among the EU states after Germany. It has obviously developed into an important hub for the trade in used

cars, and in some cases also new vehicles, to Eastern Europe. Lithuanian-based dealers buy used vehicles in other European countries and deliver them primarily via Belarus, most recently also via Kazakhstan and Kyrgyzstan and, to a lesser extent, directly to Russia. This can also be observed to a lesser extent in Poland. In addition to Belarus, German dealers also deliver via Kazakhstan, Kyrgyzstan, Georgia, and Armenia, including a relatively large number of new cars that find their way to Russia indirectly.

Figure 18: Passenger car exports from sanctioning countries to countries in the Caucasus and Central Asia in million EUR, 01/2021 - 04/2023



Source: Trade Map of the International Trade Center (ITC)

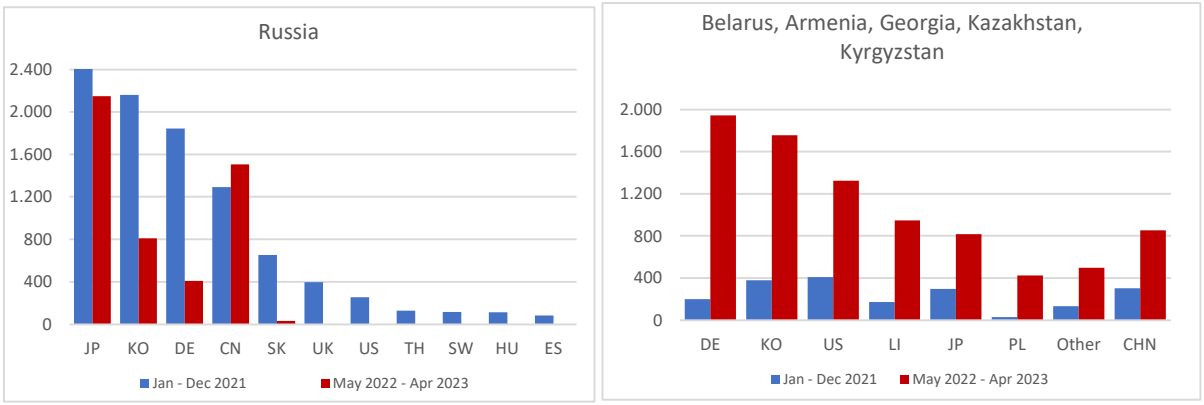
It is conceivable that these countries are only declared to the customs authorities as a fictitious destination. Once they have arrived in a member state of the Eurasian Economic Union, they can be shipped on to Russia via the open border. It is also possible that vehicles destined for Kazakhstan or Kyrgyzstan do not physically arrive there in the first place but in Russia during the necessary transit. It would be very inefficient, for example, to transport cars from Vilnius to the Kyrgyz capital Bishkek (distance: 4,600 km) and then back to Moscow (3,700 km), when Moscow is on the way to Bishkek and is only 900 km away from Vilnius.

A detour trade in mainly used vehicles has also developed from non-European countries to Russia via the countries of the Caucasus and Central Asia. While Japan supplies used cars directly to Russia, its exports of new cars to Kazakhstan and Georgia have increased significantly. It can be assumed that these are also destined for Russian end customers. South Korea supplies mainly via Kazakhstan and Kyrgyzstan, although no distinction can be made between new and used vehicles in its exports. Many used cars also reach Russia indirectly from the US, mainly via Georgia and smaller quantities via Armenia.

Figure 19 illustrates how detour deliveries of motor vehicles via the member states of the Eurasian Economic Union and Georgia replaced direct deliveries to Russia after the start of the war. Japan remained the largest exporter of motor vehicles to Russia, but now supplied almost exclusively used vehicles. China increased its exports and became the second most important supplier. All other countries drastically reduced their exports or stopped them altogether. In the case of detour deliveries via the countries of the Eurasian Economic Union, Germany is in the lead as the country of origin, followed only slightly behind by South Korea and the USA. The great importance of Lithuania as a transshipment place for vehicle trade with these countries and the growing importance of

Poland, which had supplied virtually no vehicles to these countries before the war, is well illustrated here.

Figure 19: Car exports to Russia, the other countries of the Eurasian Economic Union and Georgia in million EUR, before and after the start of the war



Source: Trade Map of the International Trade Center (ITC)

It is not yet clear whether these indirect deliveries will continue in the long term. After a temporary peak at the end of 2022, they fell again slightly in the course of 2023. However, this does not necessarily mean a trend reversal, as the high figures at the end of 2022 can also be explained by catch-up effects from the first half of the year, when the vehicle market in Russia had largely collapsed.

The detour deliveries of cars via the Caucasus and Central Asian countries serve various observers as evidence for their view that the export sanctions imposed on Russia have failed. German manufacturers in particular are accused of deliberately circumventing the sanctions for commercial reasons.[26] However, the dominance of used cars in detour trade with Russia and the supply channels described show that these accusations are difficult to substantiate. It is more likely that a group of well-connected but previously little-known entrepreneurs from Russia and/or its neighboring countries have used the sanctions as an opportunity for a lucrative new business model. Furthermore, one may ask whether the circumvention of sanctions on motor vehicles has any major impact on Russian warfare. Cars are only of minor military importance and are therefore not decisive for war. A greater shortage of private cars would affect the Russian population as a whole and make them feel the sanctions without causing humanitarian problems. If this were to increase resistance to the war, this should be a regarded in a positive sense. But this is not certain.

When assessing the effectiveness of the export sanctions, however, bypass deliveries of vehicles are not decisive. The products necessary for arms production and military infrastructure, such as semiconductors and other electronics, aircraft and spacecraft, machine tools, and trucks, are much more important. The public debate about car deliveries to Russia illustrates that the strategic objective of the sanctions imposed is not always clear. If the aim is simply to keep luxury goods off the Russian market, then deliveries of used cars are of little concern. However, if the aim is to impair the

[26] Robin Brooks, chief economist at the International Institute of Finance IIF, a Washington-based financial industry umbrella organization, has repeatedly sparked heated, sometimes emotional debates on X (formerly Twitter) about the sharp rise in exports to Kyrgyzstan, especially from Germany and other European countries, leading him and other, often ill-informed commentators to conclude that this demonstrates the energy of German companies in deliberately circumventing the sanctions imposed on Russia for business interests. https://twitter.com/RobinBrooksIIF/status/1704521368501379158

mobility of Russian society as a whole, then used car deliveries to Russia directly or via its neighboring countries should also be consistently prevented, for example by imposing secondary sanctions on all parties involved in this trade. This should then also apply to vehicles from Chinese manufacturers that contain a significant number of supplier parts from the sanctioning countries. Due to the global supply chains and the high proportion of value added by Western countries in all vehicles produced worldwide, automotive production offers considerable potential for inflicting major damage on a country through export sanctions.[27]

Without integration into global value chains, neither Russia nor any other country is in a position to establish a technologically and economically competitive automotive production. The localization policy pursued by Russia is clearly doomed to failure in the automotive industry more than in any other industry. Without high-quality and affordable vehicles, a country's transport comes to a standstill and sets it back economically by years. If Russia's economy as a whole is to be hit without immediately triggering humanitarian disasters, then the automotive industry is a worthwhile target.

What conclusions do these findings suggest?

A first conclusion is that the export sanctions imposed on Russia are having an effect, but there is still room for improvement. Russia is greatly weakened by the denial of high technology from Western production. As a result of the shortage of semiconductors, aircraft, radar equipment and high-quality computer and telecommunications technology, it does not have the most modern weapons systems and its logistics are suffering. However, this weakening of Russia could only be temporary if China succeeds in supplying these products in the same quality and in the necessary quantities.

The sanctions work best when they target Russia's economic weaknesses rather than its strengths. Russia accounts for around a tenth of global oil trade and is just as important globally for other raw materials. As long as no other country is willing and able to replace the quantities supplied by Russia, it will find buyers for its raw materials and achieve high export revenues from whomever. It is therefore illusory to want to weaken Russia by curtailing its ability to pay. Russia can afford all the war-related products available on the world market if they are available. The import sanctions are therefore clearly overestimated. But Russia can be hit hard by banning exports of high-tech products that it can neither produce itself nor purchase from allied or neutral partners. However, this is not to question the high political and symbolic significance of the import ban on oil and gas from Russia.

The export sanctions could have an even greater impact in some areas if the legal provisions were defined more precisely and, above all, if they were enforced consistently and uniformly everywhere. This applies, for example, to machine tools and machine parts such as couplings, bearings, and gearboxes, but also to instruments for physical and chemical analysis and measurement instruments in general, on which Russia is essentially dependent. These are still coming to Russia in too large quantities from countries participating in the sanctions, especially from South Korea and Taiwan, and to some extent also from Japan, Italy and Germany. Improved international coordination and increased sanctions discipline therefore appear to be necessary.

In the case of mass-produced electronic goods such as mobile phones and laptops and capital goods such as trucks, however, where China is technologically fully competitive, Russia cannot be harmed by export bans. China offers fully-fledged substitutes for these products, meaning that export sanctions

[27] This is discussed in Vakhtang Partzvania (2023): „Time Bomb: How Sanctions Are Draining the Russian Automotive Industry“, Riddle, 13. Oktober 2023.
https://ridl.io/time-bomb-how-sanctions-are-draining-the-russian-automotive-industry/

are pointless. Export bans on luxury goods such as champagne and perfume also have little more than symbolic significance.

If the aim of the sanctions is to weaken the Russian war economy, then the car exports that reach Russia via Belarus, Caucasus countries or Central Asian republics can be viewed calmly. They benefit the Russian population as a whole, as well as a small group of business leaders who make good money from this trade, but not the political and military leadership and the oligarchs. It would be different if the West were to change its strategy and wanted to weaken the efficiency and performance of the Russian economy as a whole in the long term. Cutting Russia off completely from vehicle deliveries from the West would be a suitable means of achieving this.

Vehicles and mass-produced electronic goods account for two thirds of detour trade to Russia via the Caucasus and Central Asian republics. It is obvious that there are also detour deliveries via these countries of high-tech products on which the Russian war economy depends. However, their quantitative significance is greatly relativized if vehicles, mobile phones and laptops are excluded. Nevertheless, it is important for the EU to work together with the governments of these countries to take action against the circumvention of sanctions on sensitive products and, if necessary, to include them in the sanctions themselves if they are unwilling to cooperate. Deliveries of consumer goods such as alcoholic beverages and cosmetics to Russia via intermediaries in the Baltic states should be assessed in a similar way. This undermines the export ban on luxury goods, but the consequences for Russia's ability to wage war are only minor.

By far the most important support for Russia in avoiding the negative consequences of the sanctions is China. Without the sharp increase in supplies from China across the whole range of industrial products, large parts of the Russian economy would probably have collapsed after the sanctions were imposed at the start of the war. It is to be expected that the number of products for which China can provide substitutes will gradually increase and that this will weaken the effectiveness of the sanctions. However, Russia has thus become fatefully dependent on China economically, which is increasingly turning into a political dependency. This also means that China would have the power to force Russia to end the war if it wanted to. For this reason alone, it seems advisable for the EU and the US to remain in dialog with China despite the current tensions.

However, China also exemplifies the importance of multinational companies in enforcing sanctions. Surprisingly for many, exports from China and especially from Hong Kong to Russia have not increased for some products but have fallen in line with exports from the countries that have imposed sanctions. In these cases, the deliveries originate from Chinese production sites of American, European, Japanese, or Korean companies participating in the sanctions, or they have been manufactured with their licenses or supplier parts. The global supply chains that have emerged in recent years are proving useful in this respect. Western technology is still contained in almost all high-tech products, meaning that sanctions can be extended far beyond the sanctioning countries' own exports.

Other countries without sanctions, on the other hand, can only compensate Russia in a few cases. The most important of these is Turkey, which, however, only supplies technologically mature products that Russia can also manufacture itself. This also applies to Iran. The United Arab Emirates, which have increasingly developed into an obscure place for black market trade, deserve attention. As oligarchs and other wealthy Russians have also preferred to settle there as their primary or secondary residence following restrictions on their freedom to travel in the EU, it would come as no surprise if more shady deals to circumvent sanctions were to be conducted via the Emirates in future.

If the war continues for longer because neither Ukraine nor Russia are making significant gains, it would make sense to consider extending the export bans beyond those only aimed at the Russian

arms industry and weakening the performance of Russian industry as a whole. A comprehensive and effective total ban on vehicle deliveries to Russia, including indirectly via third countries, could serve as a first step. However, instead of the current negative list of goods that may no longer be delivered to Russia, a general export ban could also be imposed as a further escalation stage, limited by a positive list of goods that may continue to be delivered to Russia for humanitarian reasons. This would reverse the burden of proof and eliminate many opportunities for circumvention.

A key finding of this analysis is that sanctions can only be highly effective with a clearly defined strategy and consistent, internationally coordinated implementation.