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Monitoring the Impact of Sanctions on the Russian Economy Quarterly Report Vol. 3

Vasily Astrov, Feodora Teti, Lisa Scheckenhofer and Camille Semelet

Quarterly Report for the Federal Ministry for Economics and Climate Action (BMWK), 30 April 2024

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Monitoring the Impact of Sanctions on the Russian Economy

*Vasily Astrov, Feodora Teti, Lisa Scheckenhofer, Camille Semelet**

This report highlights the effects of international sanctions on Russia's economic performance up to mid-2024. Despite monetary tightening, Russia's early 2024 economic growth remained strong due to a tight labor market and continued credit expansion. The fiscal outlook has improved with more positive short- and medium-term projections despite increased military and social spending. The trade surplus remained almost unchanged, masking declines in both exports and imports. Russian imports surged at the end of 2023 but have recently declined: Increased payment difficulties with third countries, exacerbated by recent U.S. executive orders, have suppressed imports despite strong domestic demand and the ruble's real effective appreciation since late 2023. In terms of trade of high-priority sanctioned products, an analysis of quantities and values traded reveals that Russia has shifted towards lower-quality suppliers from countries like China, Türkiye, and Kazakhstan. The sanctions' effectiveness thus largely depends on substituting high-quality Western goods with lower-quality alternatives. In 2023, Russia secured between 60% and 170% of sanctioned high-priority items compared to 2021 levels.

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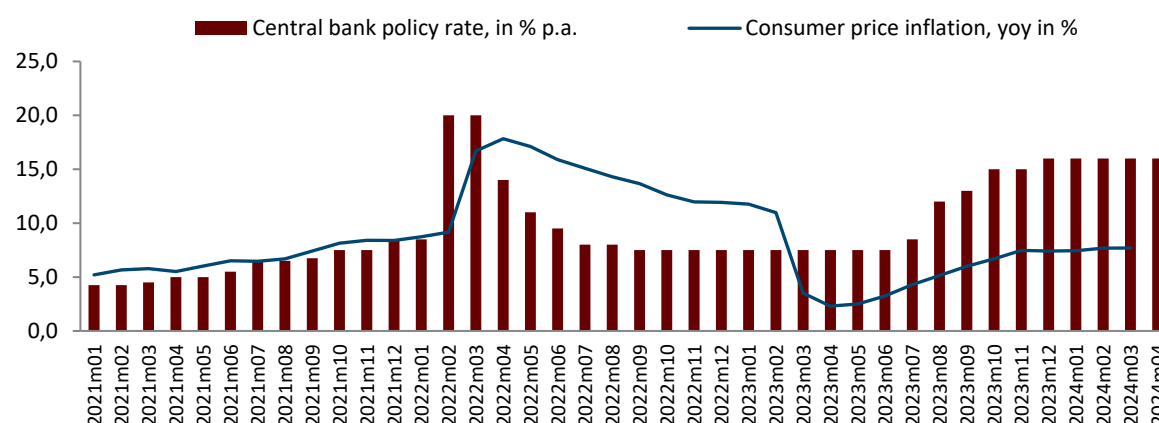
Executive Summary

- › Recent high-frequency data suggest a further strengthening of growth momentum, driven by the ongoing tightness of the labour market and the muted response of credit expansion to last year's monetary policy tightening. Nevertheless, given the recent stabilisation of inflation, the central bank reckons that 'peak overheating' will already have been reached in Q2 2024.
- › Economic recovery is expected gradually to run out of steam, with growth declining to below 3% in 2024 and closer to 2% in 2025-2026.
- › Despite increased military and social spending, the short- and medium-term fiscal outlook has brightened.
- › Imports picked up at the end of 2023 but have suffered more recently due to increased payment difficulties; the latter result from renewed US pressure on banks from third countries dealing with Russia.
- › The effectiveness of trade sanctions crucially hinges on the degree to which missing high-quality Western goods can be substituted with lower-quality products from third countries. Our calculations suggest that in 2023, the share of sanctioned CHP items that Russia is able to obtain ranged between 60% and 170% of the 2021 level, depending on the underlying assumptions with respect to the extent of quality deterioration.

1 General Economic Situation

Recent high-frequency data suggest further a strengthening of growth momentum.¹ According to the Ministry of Economy estimates, real GDP picked up by 4.6% year on year in January 2024 and by 7.7% in February. The growth in gross industrial production in Q1 reached 5.6% year on year, mainly on the back of strongly rising manufacturing (+8.8%), while the output in mining finally stabilised (+1.1%) after last year's decline.² Retail trade turnover expanded by 10.5% year on year in Q1, fuelled in part by the 5.8% rise in real disposable household incomes. The labour market continued to be very tight, with real wages increasing by 10% year on year in January-February and the unemployment rate (LFS) declining to another all-time low of 2.7% in March. Besides, private consumption has also been fuelled by a renewed uptick in consumer lending, following a dip at the end of last year in response to sharp monetary policy tightening. So far, the main transmission mechanism of policy tightening has been the strong growth in household deposits, while the response of credit dynamics has been far more muted.³ On balance, the net saving propensity of households has risen; but this has not been sufficient to offset the positive effect of rapidly rising incomes on private consumption, which has continued to boom. The consumer sentiment index has climbed to another all-time high recently.

Figure 1: Inflation and Policy Rate, in %



Source: wiiw Monthly database.

¹ Central Bank of Russia (2024).

² In particular, natural gas production soared by 10.6% year on year in Q1.

³ Ibid. The levels of indebtedness in the Russian economy are still rather moderate in international comparison; therefore, credit expansion may proceed for quite some time without jeopardizing the stability of the banking sector.

After picking up speed throughout most of last year, inflationary pressures have finally stabilised, albeit at a rather high level. By 22 April 2024, annual consumer price inflation had reached 7.8% – far above the 4% inflation target, making the case for a continuation of tight monetary policy. Since December 2023, the policy interest rate has been kept at an extremely high level of 16% (Figure 1), which means that in real terms it now exceeds 8%. This is one of the highest levels in Russia's recent history, and yet so far it has had little success in cooling the economy. Nevertheless, given the recent stabilisation of inflation, the central bank reckons that 'peak overheating' will already have been reached in Q2 2024. A gradual cooling of the economy over the remainder of the year will enable progressive disinflation. Inflation is projected to decline to 5-6% by the end of 2024, which may allow a moderate relaxation of monetary policy.

Despite the recent strong recovery, the level of economic output is still below what it would have been without the war and sanctions... Last year's GDP growth (3.6%) exceeded the recession in 2022 (-1.2%); as a result, real GDP in 2023 was 2.4% higher than prior to the war. How does this compare to the projected growth trajectory of the Russian economy, had it not been for the war and sanctions? In this alternative scenario, recession in 2022 would have clearly been avoided, but growth in 2023 - assuming more or less the same restrictive economic policies as pursued over the past decade preceding the war - would have certainly been lower. The last wiiw forecast released immediately before the start of the war (in January 2022)⁴ projected growth of 2% in 2022 and 1.5% in 2023. Thus, in the alternative scenario real GDP in 2023 would have been 3.5% higher than in 2021 and 1.1% higher than it actually was.

... but the structure of GDP would have been different, too, with a lower weight of military production and manufacturing in general. Ironically, the diversification of economy away from excessive reliance on the energy sector, which had been a subject of economic debates for decades in Russia, is now taking place. Besides, growth drivers would have been different as well. In 2023, growth was mainly driven by domestic demand fuelled by military-related fiscal expansion (sometimes referred to as 'military Keynesianism'), which was largely unthinkable before the war, as the government aimed at reducing fiscal vulnerabilities ahead of the forthcoming geopolitical conflict with the West. This fiscal expansion would almost certainly not have happened if it had not been for the war (and hence the need to produce armaments) and sanctions (and hence the need to offset their impact on the Russian economy).⁵

Nevertheless, the medium- and long-term prospects are not so bright. This year, the pace of economic recovery is expected to decline to below 3% this year and approach

⁴ Wiiw (2022).

⁵ The latter is in line with the predictions by Galbraith (2023), who argued that sanctions may effectively prove to be a 'gift' to the Russian economy rather than a tool of punishment.

2% in 2025-2026. (wiiw 2024). In the longer run, the likely falling behind on the technological front due to reduced access to advanced Western technologies and inputs (which can be only partly offset by increased cooperation with China) and the brain drain (the emigration of some of the most productive and well-educated labour force) are likely to weigh on the economic prospects. Besides, the economy has now become largely accustomed to the war-related fiscal stimulus and could face a demand-side shock once armaments are no longer needed to the same extent.

2 The Fiscal Outlook has Improved

In Q1 2024, the energy and non-energy tax revenues of the federal government soared by 79.1% and 43.2% year on year (in nominal terms), respectively. However, in the case of energy revenue the extraordinarily high increase is to be seen against the very low basis of Q1 2023, when Western energy sanctions weighed heavily on the price of Russian oil. Compared to Q1 2022, energy revenue was still 1.5% lower in nominal terms – despite the high inflation during this time. In contrast, non-energy revenue in Q1 2024 was 38% higher, and overall revenue 22% higher than two years ago. In annual terms, overall revenue picked up by 53.5% year on year, far outstripping the 20.1% rise in expenditure.

Revenue from the oil sector soared by 91% year on year in Q1,⁶ which was helped by the following factors:

- › A pronounced increase in global oil prices, which approached USD 90 per barrel (Brent oil) by the end of Q1.
- › A change in the oil taxation mechanism. Back in Q1 2023, it was still based on the actual price of the Russian Urals oil, which was highly volatile (reflecting above all the fluctuating price discount for Urals versus the benchmark Brent). Instead, since April 2023 the taxation mechanism has been based on the maximum discount versus the benchmark Brent, the value of which has been gradually lowered; starting from Q1 2024, it has been set at USD 20 per barrel.⁷
- › A one-off extra government revenue from the oil extraction tax (which was imposed as a compensation for the revocation of gasoline subsidy cuts in autumn 2023).⁸

⁶ <https://t.me/kirillrodionov/654>.

⁷ <https://www.interfax.ru/russia/951910>.

⁸ Initially, the price subsidy for domestically sold gasoline was cut markedly. However, the measure led to a (widely unpopular) sharp rise in retail gasoline prices, prompting the government to reinstate the subsidy, see e.g. <https://www.interfax.ru/business/930995>.

- › Rouble devaluation, which inflated the value of revenues from energy exports in rouble terms: at the beginning of last year, the exchange rate was around 70 RUB/USD, versus 90 RUB/USD or more now.

Overall, in Q1 the federal budget closed with a deficit of a mere 0.3% of GDP.⁹ Thus, on current trends the official deficit target of 0.9% of GDP set for this year will probably not be missed by much, and it is highly unlikely that the government will run out of funds for warfare any time soon. Despite high military spending and extra expenditures on five new 'national projects' and other policy measures announced by President Putin ahead of the March 2024 presidential elections¹⁰ (which may cost between 0.5% and 1.1% of GDP per year during 2025-2030, according to some estimates),¹¹ the budget deficit is expected to remain at below 2% of GDP in the medium term on account of decent economic growth and relatively high inflation, which boost tax revenues.

Government revenue should be also helped by the planned fiscal reforms: a more progressive taxation of personal income and a hike in corporate income tax. The government draft proposal reportedly envisages the introduction of personal income tax rates ranging from 13% to 20% (instead of 13-15% currently), as well as a hike in the corporate tax rate from 20% to 25%.¹² Besides, revenue should be boosted by the ambitious privatisation plans (not least involving the sale of the nationalised assets of foreign companies). While last year privatisation revenues of the federal budget reportedly reached RUB 29bn (EUR 315m),¹³ the target for 2024 has been set at as much as RUB 100bn (EUR 1bn), although it remains to be seen whether this target will be really met.

The liquid part of the National Welfare Fund, which is now held entirely in Chinese renminbi and gold and can be used to cover budget deficits, is now standing at around 3% of GDP and thus may be depleted by the end of 2026. Still, the government will have the option to borrow from domestic banks: at 15% of GDP, Russia's public debt is still very low and the room for public borrowing accordingly large. However, the yields on government bonds have risen recently, briefly exceeding 14% p.a. on ten-year maturity

⁹ https://minfin.gov.ru/ru/press-center/?id_4=38945-predvaritelnaya_otsenka_ispolneniya_federalnogo_byudzheta_v_1_kvartale_2024_goda.

¹⁰ The announced measures include inter alia the modernisation of housing, utilities as well as airports, the prolongation of the subsidised mortgages programmes, the building of new schools and renovation of kindergartens, an increase in teachers' salaries, the launch of satellites, etc.

¹¹ <https://t.me/dmitrypolevoy/619>.

¹² The planned hike in the corporate tax rate should not be a major problem for the private sector, especially if in return the government abstains from the introduction of ad-hoc taxes on businesses (such as the recently imposed 5-10% windfall profit tax or the export duties on a wide range of items, motivated by the weak rouble and accordingly high profits of exporters) in the future. Also, the profit share of GDP – despite recent decline – is still rather high in Russia, creating a welcome buffer for a higher taxation burden.

¹³ <https://www.forbes.ru/biznes/503254-pravitel-stvo-rossii-v-16-raz-perevypolnilo-plan-po-dohodam-ot-privatizacii>.

bonds at the beginning of April. With the policy rate of the central bank likely to be kept at elevated levels in the foreseeable future, the borrowing costs for the government will stay accordingly high.

3 Imports from Russia Soared at the End of 2023...

In this chapter, we describe the most recent developments of Russia's monthly imports (in real USD terms) across origin countries since September 2023. As in the January report, we combine data from various sources: aggregated import flows are from the Russian Central Bank, disaggregated trade statistics come from national sources (mirror statistics) and UN Comtrade data. The trade statistics provide information at the HS6 product-level for 79 countries (EU27 plus 52 other countries)¹⁴, which accounted for 80% of all Russian imports in 2019. To determine the sanction status of all products, we leverage the ifo sanctions database.¹⁵ The international product classification transitions from HS2017 in 2021 to HS2022 in January 2022. To be able to compare trade flows across time, we follow the literature and concord all product codes to the earliest available classification, which is HS2017, ensuring that all our products are in HS2017 over the entire time period.

In Q4 2023, total Russian imports remained constant and close to the levels of previous quarters, albeit with higher values in November and December, that increased by almost USD 2bn compared to September and October and exceeded usual end-of-year trends. In the aggregate, this surge is mostly explained by imports of non-sanctioned and partly sanctioned products. While trade with the EU27 remained stable, China, still

¹⁴ National statistics: China (for 2024), Kazakhstan; Eurostat's Comext: EU countries; Comtrade: Andorra, Argentina, Australia, Azerbaijan, Benin, Burkina Faso, Bahrain, Bosnia and Herzegovina, Belize, Brazil, Barbados, Canada, Switzerland, Chile, China (for 2021-2023), Spain, United Kingdom, Georgia, Guatemala, Guyana, Hong Kong (until 2023m11), India (until 2023m11), Israel, Iceland, Kyrgyzstan (2023m7 missing), Macao, Madagascar, Mexico, Moldova, Mozambique, Mauritius, Malaysia, Namibia, Nicaragua, Norway, New Zealand, Panama, Philippines, Paraguay, Serbia, Togo, Türkiye, Tanzania, Uruguay, United States, Uzbekistan (until 2023m11), South Africa, Zambia, Zimbabwe.

¹⁵ The export sanctions introduced on 18 December 2023 in sanction package 2023/2878 are to be neglected in this report for two reasons: (i) due to their phase-in period, these sanctions do not have an entry-into-force date that falls within our period of interest, and (ii) due to their adoption after 15 December, these sanctions would not be considered as falling within the month of December in our analysis, even without a phase-in period.

the primary supplier to Russia, accounted for half of this increase.¹⁶ Importantly, imports of sanctioned products also started to increase from USD 2.5bn on average since March 2023, they totaled USD 2.8bn at the end of 2023. We next describe these developments in detail.

Chinese exports of sanctioned products to Russia soared unprecedentedly at the end of 2023, confirming the strong reliance of Russia on its key trading partner. In absolute terms, they increased from USD 1.8bn in October 2023 to USD 2.3bn in December, reaching for the first time almost two times pre-war levels. Sanctioned products that saw the largest increase in imports are automatic data processing machines (HS2017 product: 847130) and communication apparatus (HS2017 product: 851762); they increased by USD 145m in November and USD 79m in December, respectively.¹⁷ Alongside with China, India increased its exports of sanctioned goods to Russia by 22% between September and November, with aircraft and spacecrafts (HS product: 880330) driving the increase (USD 9.3m).¹⁸

Previous reports highlighted the importance of Türkiye and CIS countries in providing sanctioned goods to Russia. However, within this group of countries recent trends have been diverging: While Azerbaijan and Uzbekistan increased their exports in early 2024, those of Türkiye, Kazakhstan and Armenia have recently decreased. Following two spikes in August and September 2023, imports from Uzbekistan grew again between October and November by USD 7m. A sudden large increase in import volumes from Azerbaijan in the first two months of 2024 is solely attributable to polymers, that are, for example, used in the automotive and electrical industry (propylene copolymers, HS2017 product: 390230).¹⁹ On the opposite, Kazakhstan's exports to Russia started to drop in December 2023 (USD 39m between 2023m11 and 2024m1). After a surge in exports of large airplanes in August 2023, Armenian exports of sanctioned products have constantly been dropping to reach USD 8m in January 2024. Finally, in the case of Türkiye, exports of sanctioned products to Russia have dropped since December to reach

¹⁶ Interestingly, we observe a surge in Russian imports from China for a specific type of electrical transformers (liquid dielectric transformers; HS6 product: 850423) during that period. The trade value for these transformers has been close to zero since the start of our time series (2023m1), soaring to USD 231m in December 2023—thus explaining a large share of the increase in non-sanctioned product imports from China at the end of 2023.

¹⁷ These products have been largely imported throughout the war by Russia, suggesting that this surge is not seasonal.

¹⁸ Data for India is only available until November 2023, which does not allow us to say anything about the evolution of Indian exports to Russia after that.

¹⁹ This product has been imported from Azerbaijan before, with a comparable spike in August 2023 (USD 9.0m, against USD 9.9m in February 2024).

USD 136m in January 2024 or 40% of the 2023-monthly average. For Russia's second largest import partner, this is the first significant decrease since 2022.²⁰

The decrease in exports of sanctioned products for Türkiye and Armenia seems to coincide for certain goods with an increase in China's exports to Russia. For Armenia, some of the largest export decreases since August 2023 have been observed for automatic data processing machines (HS2017 product: 847130) and communication apparatus (HS2017 product: 851762). Interestingly, we see that Russia's imports of those products from China have recently increased by more than this drop; they represented the largest import increases from China since September 2023 across all sanctioned goods. We observe a similar pattern for some of Türkiye's declining exports to Russia: for example, exports of iron or steel parts (HS2017 product: 730890) dropped by USD 2.5m (between 2023m11 and 2023m12), while Chinese exports of this product increased a few months later (by USD 128m between 2024m2 and 2024m3). This overlap may signify a possible alteration in trade routes, yet the full scope of this transition remains uncertain at this time.

Throughout 2023, the EU's direct exports of sanctioned goods to Russia were close to zero, indicating the significant impact of the implemented sanctions. Meanwhile, complete substitution of these goods from alternative sourcing countries proved unattainable for Russia, with approximately 40% of pre-war values of sanctioned good imports missing in 2023. Also, in 2023 China stayed the pivotal player in Russia's import landscape, stepping in to fill the void left by the EU sanctions since the onset of the war with a remarkable surge of around 60% in sanctioned goods exports to Russia in 2023 compared to pre-war periods. Moreover, over the course of 2023, Türkiye as well as CIS countries, predominantly Kazakhstan, Armenia, Uzbekistan, and Azerbaijan continued to play crucial roles in providing access to sanctioned products for Russia underscoring the complex dynamics at play in international trade amid geopolitical tensions.

²⁰ This pattern is not restricted to a few products only; however, exports of petroleum oils (HS6 products: 271019) account for a large share of the decline.

4 ...But Have Suffered More Recently Due to Increased US Pressure on Banks From Third Countries

According to preliminary central bank data,²¹ Q1 2024 closed with a current account surplus of USD 22bn, which is higher than in both Q1 2023 (USD 15bn) and in any other quarter of 2023. In relation to GDP, the surplus reached 4.6%,²² compared to 2.5% in 2023 as a whole. The annual increase was almost entirely due to the improvements in the services balance²³ and the income balance (in both cases, deficits declined), whereas the trade surplus in goods increased only marginally, by USD 700m. However, the nearly unchanged trade balance masks the fact that both exports and imports recorded strong declines, with the decrease in imports (-10.6% year on year, in US dollar terms) outstripping that of exports (-6.9%).²⁴ In March, the gap between the dynamics of exports and imports was particularly pronounced: while exports rebounded after the low of January-February (largely thanks to higher oil prices), imports continued on a downward trajectory, contracting by 7% in monthly seasonally adjusted terms. In Q1 as a whole, merchandise imports stood at a mere USD 67bn, marking the lowest level over the last seven quarters (Figure 2). In seasonally adjusted terms, they have been declining now for three quarters in a row, which stands in stark contrast to the ongoing strong domestic demand and the real effective appreciation of the rouble since Q4 2023 (both these factors should have supported imports under normal circumstances).²⁵

Anecdotal evidence suggests that the main factor suppressing imports recently has been increased payment difficulties in trade with third countries, such as China, Türkiye and the United Arab Emirates. Following US President Biden's Executive Order No. 14114 signed on 22 December 2023, which greatly facilitated the enforcement of secondary sanctions on banks from third countries 'facilitating Russia's war machine',²⁶

²¹ http://www.cbr.ru/statistics/macro_itm/svs/bop-eval/.

²² Development Centre (2024).

²³ The structure of Russia's foreign trade in services is dominated by transportation services and trips abroad. In 2023, these two categories accounted for 36% and 16%, respectively, of total services exports, and 21% and 44%, respectively, of total services imports.

²⁴ The main factors behind export decline were reportedly: (i) lower export prices of natural gas, coal and some metals, (ii) new import restrictions on Russian goods by the EU and G7 (such as on diamonds), (iii) higher import tariffs, such as the introduction of a 200% tariff on Russian aluminium by the US, and (iv) lower output of Russian refineries, https://www.kommersant.ru/doc/6651610?from=glavnoe_3.

²⁵ Development Centre (2024).

²⁶ The Executive Order No. 14114 was, inter alia, an amendment to the Executive Order No. 14024. It stated that 'a financial institution sanctioned... will face either full blocking sanctions or the loss of, or strict conditions on, their US correspondent accounts'. <https://www.whitehouse.gov/briefing-room/statements-releases/2023/12/22/fact-sheet-biden-administration-expands-u-s-sanctions-authorities-to-target-financial-facilitators-of-russias-war-machine/>.

many of them started delaying or refusing to process payments to and from Russia. Payment difficulties have reportedly been particularly big on the import side (although export payments have been affected as well), particularly for imports of electronic parts and components, which are used inter alia in military production. As a result, e.g. Russian imports from Türkiye plunged by around a third (year on year) in the first two months of 2024.

More recently, problems with payments have also been mounting with the Chinese banks. Many of them started demanding written confirmations that transactions are not linked to the Russian armed forces, military industry or the newly annexed Ukrainian regions; some banks have stopped processing payments with Russia altogether.²⁷ Even payments in Chinese yuan for purely civil goods have reportedly been affected.²⁸ As a result, in March 2024 Russian imports from China declined by 14.2% year on year, according to China's customs statistics (while in February, their dynamics was still positive: +9.6%), with imports of machinery and equipment being hit particularly hard.²⁹ Recent visits to China by the US treasury secretary Janet Yellen (on 3-9 April)³⁰ and the state secretary Anthony Blinken (on 24-26 April)³¹ have reportedly put further pressure on Chinese banks against dealing with Russia. Should these problems persist, the Russian economy may be essentially cut off from the imports of critical parts and components, resulting in GDP growth being lower than forecast in the baseline scenario.

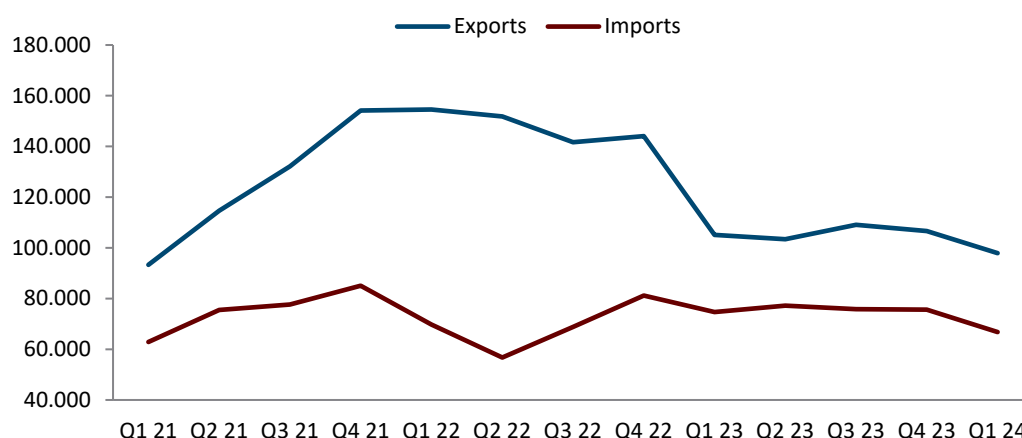
²⁷ <https://iz.ru/1680898/mariia-kolobova/peremennaia-obstanovki-banki-v-kr-vvodiut-novye-usloviia-dlia-platizhei-iz-rf>.

²⁸ <https://thebellmirror12.site/sborka-elektroniki-na-pauze-iz-za-kitayskikh-bankov-kurortnyy-sbor-prev-ratyat-v-nalog-skhemu-s-rezervami-dlya-ukrainy>.

²⁹ <https://www.rbc.ru/economics/23/04/2024/662664779a7947ad752fb84e>. In monthly terms, imports from China in March 2024 increased by 0.6% compared to February but registered a marked decline by 17.3% compared to January (own calculations based on [China's General Customs Administration](#) data).

³⁰ <https://home.treasury.gov/news/press-releases/jy2218>.

³¹ <https://www.wsj.com/politics/national-security/u-s-takes-aim-at-chinese-banks-aiding-russia-war-effort-fcf76dcc>.

Figure 2: Merchandise Exports and Imports, in USD Million, Quaterly in 2021-2024

Source: Central Bank of Russia.

The possible options for Russia to circumvent the payment problems with the third countries are not that many. Apart from increased transactions with the third countries' banks that have no exposure in the US and to the US dollar, and are therefore largely immune to US pressure, another possible solution would be increased use of cryptocurrencies (such as the digital rouble) for payments; a corresponding law was already adopted in March.³² Also, Russian banks could set up subsidiaries in third countries; however, this process would take time (e.g. VTB is reportedly the only Russian bank having a subsidiary in China at present). Finally, the processing of payments could be re-routed via other third countries, which are not (yet) on the radar of the US authorities. However, this would provide most probably only a temporary solution and inevitably involve additional costs, which would have to be ultimately paid by the Russian consumers and businesses.

The remainder of this report analyses the effects of Western sanctions on the prices and quality of sanctioned common high priority (CHP) items imported by Russia.

5 Prices and Product Quality Matter For the Effectiveness of Sanctions

The sanctions implemented by the European Union (EU) and other Western allies have effectively halted direct exports to Russia (see our earlier reports in January 2024 and October 2023). Our previous analyses have relied on comparisons of trade values across countries of origin. This approach, which is standard in the literature, offers valuable

³² <https://www.rbc.ru/crypto/news/6613b56a9a79473ff78a977f>.

insights into broad shifts in Russian import patterns since the onset of the Ukraine conflict. It may, however, not be suited to accurately assess Russia's ability to replace the missing Western imports, as it fails to account for any potential changes in prices (i.e., due to inflation), as well as the variation in product quality (i.e., imperfect substitution).

In this chapter, we will discuss the role of changes in prices and product quality and analyse their relevance for the CHP items that include 48 goods critical to Russian weapon systems and its military development (c.f., our report from January for more details).³³ We use the same data as described in more detail in our previous reports and in the next chapter; they contain exports values (in USD) and quantities (in kg) to all destinations, allowing us to construct unit values for every CHP item, which we will use as a proxy for product-level prices.³⁴ From our previous analyses we know that the time series of Russian imports are plagued by notorious outliers. Since our goal is to inform about general price trends, we would like to smooth them out. To this end, we aggregate the raw monthly data to yearly data, in order to then calculate unit values.

To understand the interplay between import prices, values, and the ability to substitute missing imports due to sanctions, it is helpful to formalize a measure to quantify Russia's ability to access CHP items since the beginning of the war. Ideally, we would like to compare the change in total Russian imports of CHP items since the onset of the war to the pre-war levels, i.e., the share of pre-war levels of imports that can be substituted with imports from third countries. Hence, the resulting share tells us about how easy it is for Russia to substitute missing imports from the West: The lower the share, the harder it is for Russia to access CHP items and the higher the effectiveness of the sanctions. The equation below describes this relationship, where import values M are the product of prices p and import quantities q and the index $t-1$ indicates pre-war values. Hence, a change in the measure of effectiveness of sanctions can be either due to different quantities or prices. Therefore, solely focusing on observed import values might not give us a clear-cut answer to the question on how easy it is for Russia to substitute missing CHP items from the West, as we cannot disentangle between price effects and changes in import quantities.

$$\frac{M}{M_{t-1}} = \frac{M^{EU} + M^{3rd}}{M_{t-1}} = \frac{\overbrace{(p^{EU} \times q^{EU})}^{\text{values EU}} + \overbrace{(p^{3rd} \times q^{3rd})}^{\text{values 3rd countries}}}{\underbrace{M_{t-1}}_{\text{total values pre-war}}}$$

³³ The CHP items were taken from the list published by the EU on 22 February 2024: [List of common high priority items - European Commission \(europa.eu\)](https://ec.europa.eu/eu_sanctions/content/list-common-high-priority-items). The list includes the following new HS2017 codes: 845710, 845811, 845891, 845961, 846693. To observe trade flows over time, we need to translate the HS2022 codes into the HS2017 nomenclature.

³⁴ Unit values are a standard measure in the international trade literature to proxy product-level prices.

If prices increase, we may falsely assume sanctions to be less effective by only looking at import values as we ignore any inflationary effects; conversely, lower prices will overstate the effect of sanctions, conditional on the same product-quality. One might think that focusing on import quantity fixes this problem. While this is true for single products, as soon as the goal is to aggregate over different products—to make statements for all CHP items, for example—it is impossible to distinguish between increases in actual quantity of imports and shifts in the import composition from light to heavy products.

Why would we assume prices to increase in the first place? First, worldwide inflation is at high levels. Second, in the case of sanction evasion through entrepôt countries, we expect prices of Russian imports to increase even more. Buying EU goods through entrepôt countries entails higher trade costs due to longer trade routes. Moreover, the involvement of multiple intermediaries in logistics may introduce mark-ups along the supply chain as they seek compensation for their services. Lastly, we expect higher prices for imports from suppliers from non-sanctioning countries that are offering the same quality as exporters from the EU. New suppliers from neutral third countries could not compete with Western exporters before the war (e.g., due to higher production costs), otherwise they would have already been serving the Russian market in the pre-war period, and charge therefore higher prices. Note that in our analysis we will not be able to disentangle the different channels of the overall price effects.

At the same time, prices do not have to necessarily increase. An alternative way of substituting missing Western imports is through lower quality products from third countries such as China. For example, newspapers have reported that Chinese firms sell US headphones without American licenses and in bulk, which reportedly reduces the price from originally USD 150 to USD 19.³⁵ Alternatively, Russian firms could substitute missing Western inputs by recycling used ones or replace parts with non-original and cheaper parts, as it has been reported for the aerospace industry.³⁶ Again, prices are informative to understand this channel, as we would expect firms with lower quality to charge lower prices for the same CHP item than firms with higher quality. Following the literature, we will interpret lower prices as a proxy for lower quality.³⁷

³⁵ [Sanctions hole - Layout \(verstka-media.translate.google\)](#).

³⁶ <https://istories.media/en/stories/2023/09/12/russian-airplanes-spare-parts/>.

³⁷ See for example seminal papers by Flach & Unger (2022), Lugovskyy & Skiba (2015) and Dingel (2017).

6 The Effectiveness of Sanctions Hinges on the Substitutability between Low- and High-Quality CHP Items

To determine how easy it has been for Russia to substitute missing Western CHP items, we adjust the import values for the years 2022 and 2023 to account for price effects. Thereby we quantify two scenarios.

Scenario 1: Imports from third countries are a perfect substitute for missing CHP items from the EU

To eliminate price effects stemming from general inflationary pressure as well as potentially higher prices due to costly sanction evasion, we multiply the quantities imported in 2022 and 2023 with EU prices for exports to Russia from 2021 for every CHP item. Note that in this scenario we assume quality to stay the same, i.e., imports from third countries such as China or Türkiye is of the same quality and hence a perfect substitute to the European counterpart. Our calculations show that under the assumption of perfect substitutability between CHP items from the EU and third countries, Russia was able to import 154% of the pre-war levels in 2022, and 170% in 2023 (c.f., row (1) of Table 1).

Table 1: The Degree of Substitution of Missing CHP Items

Adjustments		2022	2023
(1)	price adjustment, no quality adjustment	154%	170%
(2)	price and quality adjusted	71%	60%
(3)	no adjustment	60%	67%

Note: This table shows total Russian imports of CHP items in 2022 and 2023 as % of 2021, with and without price and quality adjustments. Details about the adjustments can be found in the text.

These high numbers illustrate very impressively that the imported quantity of CHP-items substantially went up compared to the pre-war period. However, this does not necessarily mean that the CHP items imported from third countries are a perfect substitute for the missing European ones. If third countries can only provide lower quality products, the presumably high share of substitutability is inflated as third country varieties are not perfect substitutes for European ones.

To say something about potentially underlying differences in the quality across different origin countries, the literature suggests comparing unit values of different varieties, i.e. the same product from different origins (i.e., Flach & Ungerer (2022), Lugovskyy & Skiba (2015), and Dingel (2017)). In our context, we would like to compare unit values in the pre-war period, to understand if third country varieties are perfect substitutes for European ones or if they are of lower quality measured by lower unit values. In principle, we could do this comparison for each of the 48 CHP items separately. However, as interpreting these results is very cumbersome and uninformative, we aggregate and compare the simple average of the unit values of all 48 CHP items in 2021 across origin countries.

Table 2 shows the simple averages over all CHP items for the years 2021 until 2023 and by origin countries. The simple average unit value over all 48 CHP items for 2021 of imports from the EU equals 599 USD/kg. For the same set of products and year the simple average of the Chinese varieties is on average more than 2.5 times lower in the pre-war period. As we are comparing the same set of products in the same year that are being exported to Russia, these differences can be interpreted as underlying differences in quality, i.e., the CHP items that Russia sources from China in 2021 were of lower quality than the European counterpart. For the remaining third countries, this comparison is not as straightforward because they did not export all 48 CHP items. Hence, a comparison to the EU is less meaningful as differences might arise due to different baskets of CHP items. For example, Turkey only exported 36 CHP items in 2021 to Russia, Kazakhstan only 37.

Also note that if the European varieties of CHP items were transshipped through entrepôt countries to avoid sanctions but are otherwise identical to the pre-war varieties (i.e., same quality) we would expect prices to go up and exceed the European average unit values before the war as higher transportation costs as well as high levels of inflation since the onset of the war drive prices up. However, when we compare the simple average over all exported CHP items across origin countries, we do not see this across the board. Instead, for China, which is the most important supplier of CHP items for Russia (c.f., January report), the average unit values in the year 2023 are still roughly 25% lower than the pre-war EU unit values. Interestingly, across time there is a significant increase in the average unit values of Chinese varieties. In addition, we find that there is a distinct Russia-specific markup apparent in China's pricing strategy. In 2022, China charged on average 1.8 times more for exports of CHP items to Russia compared to other BRICS countries³⁸, which are a suitable control group to account for global trends such as differences in demand in the CHP items. This differential price increased to 2 times in 2023.

³⁸ Brazil, India, and South Africa.

Table 2: Simple Average of Unit Values of Russian Imports of CHP Items from Different Origin Countries

		2021	2022	2023
(1)	EU to RUS			
	avg USD/kg	599	.	.
	% (22/23 vs. 21)			
	Nr of items	48	.	.
(2)	CHN to RUS			
	avg USD/kg	227	418	445
	% (22/23 vs. 21)		84%	96%
	Nr of items	48	48	48
(3)	ARM to RUS			
	avg USD/kg	283	1244	553
	% (22/23 vs. 21)		340%	95%
	Nr of items	22	42	44
(4)	KAZ to RUS			
	avg USD/kg	112	453	584
	% (22/23 vs. 21)		305%	422%
	Nr of items	37	42	45
(5)	TUR to RUS			
	avg USD/kg	169	201	716
	% (22/23 vs. 21)		19%	324%
	Nr of items	36	45	47
(6)	SRB to RUS			
	avg USD/kg	2679	886	901
	% (22/23 vs. 21)		-67%	-66%
	Nr of items	21	39	27
(7)	SRB to RUS			
	(w/o HS6 852580, 847150, and 903082) ³⁹			
	avg USD/kg	388	824	877
	% (22/23 vs. 21)		113%	126%
	Nr of items	18	37	25

Note: The table shows the simple average unit values for imports from the EU, entrepôt countries and China to Russia. The percentage change in the second row is the change with respect to 2021, the third row gives the number of CHP items (their total number is 48) that are exported at least once in the respective year. Data for Kyrgyzstan is unfortunately not available due to incomplete time series.

Source: UN Comtrade, Comext, national statistics for Kazakhstan.

Scenario 2: Low-quality Imports are an Imperfect Substitute for Missing High-quality CHP Items

The assumption of perfect substitutability between high-quality European and low-quality CHP items from third countries does most likely not hold: if they were perfect substitutes, we should have seen zero or very little imports of more expensive EU products in the pre-war period. However, this is not the case, instead the EU used to be a major supplier of CHP items for Russia. Furthermore, reported smuggling activity of, for example, micro-chips by private individuals would not be necessary (and profitable) if

³⁹ HS6 852580: Television cameras, digital cameras and video camera recorders; HS6 847150: Units of automatic data processing machines; processing units other than those of item no. 8471.41 or 8471.49, whether or not containing in the same housing one or two of the following types of unit: storage units, input units or output units; HS6 903082: Instruments and apparatus; for measuring or checking semiconductor wafers or devices.

perfect substitution was possible. Hence, using EU prices for calculations will only give a useful upper bound of Russia's ability to substitute missing imports of CHP items.

To correct for the differences in quality, we next adjust prices for the three countries, for which Russia seems to be sourcing low-quality CHP items, i.e., China, Türkiye, and Kazakhstan. To achieve this, we replicate the previous procedure, but for imports from the three low-quality suppliers, we use their respective export prices to Russia in 2021 instead of the EU ones. Adjusting for quality reduces the degree of substitution of pre-war imports of CHP items to 71% in 2022 and 60% in 2023, respectively. These numbers can be seen as a lower bound of Russia's ability to substitute missing imports of CHP items. In particular in the short-run, we would expect substitutability between high- and low-quality products to be high, as lower quality, for example, due to the lack of costly licences of non-original spare parts, might lead to a shorter lifespan of products but most likely does not make a large difference in the short-run. Put differently, if we could perfectly observe quality and adjust for it, we would expect the share of substituted imports to be somewhere between the values reported in Table 1 in rows (1) and (2).

7 Little Evidence of Higher Costs due to Sanction Evasion

Unfortunately, it is not possible to definitely determine whether sanction evasion is costly and if so, how much more Russian importers have to pay to still have access to EU products. For that, we would need much richer data, such as transaction-level product description, to determine the quality of the exported CHP item, as well as more information about additional trade costs, for example higher freight costs. However, the evidence presented in this report goes against the claim that sanctions lead to significantly higher prices for Russian imports, which would make it harder for Russia to substitute missing imports of CHP items. Why is that? If higher prices were inflating import values and therefore making us falsely understate the effectiveness of sanctions, the unadjusted shares of pre-war import levels should be higher than the adjusted ones. However, this is not the case.

This does not mean that the sanctions have no effect whatsoever. Our analysis shows that Russia imports CHP items that are of lower quality, with potentially severe negative effects in the medium- to long-run. Furthermore, we have some suggestive evidence that prices for these lower quality CHP items increased quite substantially.

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