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Heli Simola

Recent trends in Russia's import substitution of technology products

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Bank of Finland
BOFIT – Institute for Emerging Economies

PO Box 160
FIN-00101 Helsinki

Phone: +358 9 1831

Email: bofit@bof.fi
Website: www.bofit.fi/en

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Abstract

Russia has long aimed at reducing its dependency on imported technology. These aspirations intensified after Russia's invasion of Ukraine and sanctions restricting Russia's access to foreign technology. We analyze Russian company surveys and a small sample of product-level statistical data to evaluate recent trends in Russia's import substitution of technology products. For the goods included in our sample, import substitution seems quite limited. Instead, Russian companies have replaced many sanctioned imports with similar or equivalent goods from other countries. Shortfalls of certain goods suggest unavailability of adequate import substitutes and the inability of domestic production to make up for the lost imports.

Keywords: Russia, imports, sanctions, technology

1. Introduction

Russia has long sought to reduce its dependence on imported technology through increased domestic production. Official calls for import substitution intensified after Russia's invasion of Ukraine and the widening of sanctions to restrict Western technology exports to Russia. Russia's pursuit of technological sovereignty is restated in the latest presidential orders for the upcoming six-year term. For example, the overall level of imports should decline to 17 % of GDP and a new national project for securing technological sovereignty will be launched covering such fields as automation and driverless transportation. Putin also wants Russia to become one of the world's top-25 countries by intensity of industrial robots by 2030.

Despite its aspirations, Russia's success in import substitution was limited up to 2022. The share of domestic production in consumption mainly increased in the agriculture and food sectors, and often led to higher consumer prices. A recent analysis by the Higher School of Economics (HSE, 2023) found that import substitution was most robust in industries such as agriculture, wood processing and pipe manufacturing that are distant from the technological frontier. The authors conclude that key factors supporting import substitution in these industries was access to foreign technology, FDI and a focus on exports. All these factors are now limited by the sanctions.

In this note, we analyze the current situation of Russia in relation to import substitution. Combining data from various Russian sources and foreign export statistics, we review recent Russian company surveys related to the topic. We then compare Russian output data and foreign export data for a handful of technological products to examine the recent trends in the supply of these goods in Russia. Obviously, there is much uncertainty related to the analysis due to limited data availability and the questionable quality of Russian statistics. If anything, they are biased towards the positive, i.e. Russian statistics likely exaggerate the amount of domestic production. Even so, in general there appears to be import substitution for industrial products only in limited amounts.

2. Import substitution in the light of company surveys

The HSE (2023) analysis suggests that Russian companies before the war were critically dependent on imports, particularly technology and services imports. Depending on the industry, the share of imports in these categories ran between 30 % and 60 %, with highest import percentages recorded for computers, electronics and the car industry. Critical import dependence for components and machinery ranged around 20–30 %. Undeniably, sanctions imposed on exports to Russia by Western countries initially caused a sizable shock for Russian companies.

Russian companies have attempted to adjust to wartime conditions over the past two years, but recent company surveys suggest problems persist. A survey conducted by the Central Bank of Russia (CBR) at end-2022 suggested that about half of the responding manufacturers had been unable to rearrange their supply chains (Karlova & Puzanova, 2023).[1] Among the respondent companies, 20 % considered it impossible to replace all lost imports by any means, while 30 % said that they already had resolved their lost-import issues. Successful substituters had managed to acquire the same goods through new suppliers or switched to imports from alternative markets and domestic products.

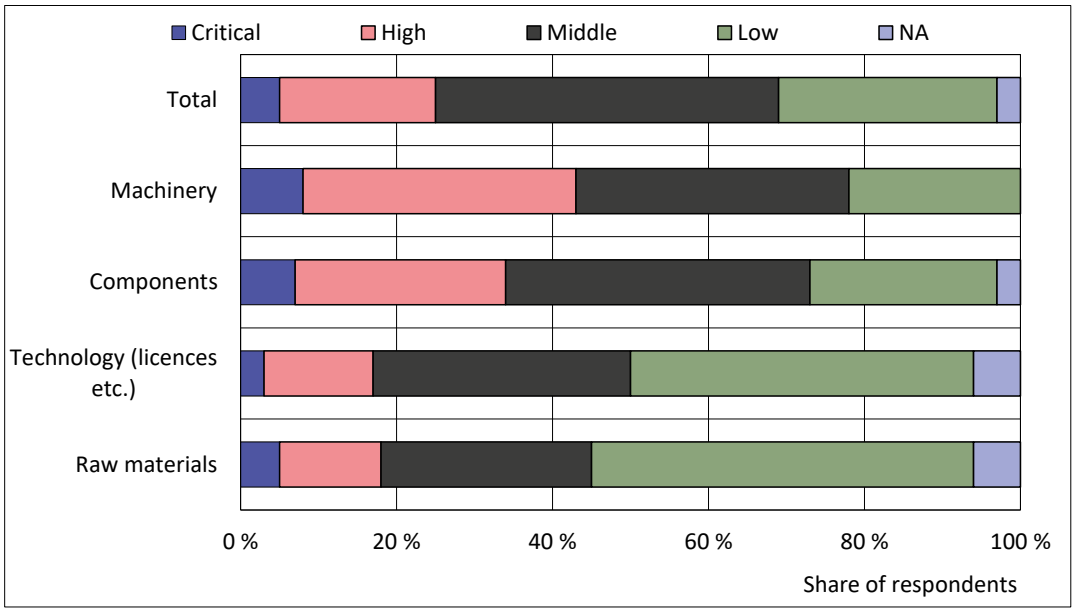
[1] The survey covers 1,974 manufacturing companies.

The situation was similar with spare parts for imported machinery and new machinery. About half of the companies said that they still had problems acquiring spare parts. Some 15 % reported that they see no solutions to their supply issues even over a medium-term perspective. For spare parts, the most common solution was to use parts imported from other markets. Many respondents expected, however, this switch would reduce the quality of final products, as well as shorten the lifecycle and lower the productivity of the machinery. Those acquiring new machinery mainly switched to imports from other countries rather than domestic alternatives. For many respondents, the change meant lower quality or technological capability of the machinery.

A more recent HSE survey (Lola, 2024) found that nearly two-thirds of responding Russian companies had experienced no reduction in their import dependency in 2023 compared to 2022.[2] The highest shares were recorded for consumer-oriented industries (e.g. textiles and food) or companies in traditionally export-oriented industries such as wood processing and coal mining. These industries companies in pre-invasion years also reported the highest levels of dependence on imported materials and machinery. In contrast, the highest share of companies reporting increased import substitution was in manufacturing of computers & electronics and electrical equipment.

A quarter of the companies characterized their overall import dependency as critical or high while additional 44 % of companies themselves to have medium dependency (Figure 1). The highest import dependency was reported for imported machinery (critical or high for 44% of companies) and components (critical or high for 34 % of companies). At the same time, on average about half of industrial companies said they had high or medium needs for domestic analogues in production. The high needs were particularly pressing in industries of computers & electronics and the manufacture of medicines. Similar results are also found in a Gaidar Institute company survey in which about half of respondents said they had to deal with a lack of domestic substitutes for their lost imports (Kommersant, 2024). A quarter of respondents claimed that they had to shut down their imported machinery after losing access to imports.

Figure 1. Russian companies dependency on imported resources at end-2023.



Source: HSE.

[2] The survey was conducted at end-2023 and it covers more than 1,000 industrial companies located in 30 different regions of Russia.

The need for domestic substitutes is reflected in the responses of the CBR investment survey (Karlova & Puzanova, 2024). Companies note that increased domestic demand was by far the most important factor stimulating investment in 2023. The respondents report that overall slightly over half of industrial companies operated at full capacity last year. The highest share of companies working at full capacity was in the "other transport equipment manufacturing" category (85 %), followed by manufacturing of computers & electronics, cars and other machinery. Companies in these industries reported underinvestment in recent years and the lowest shares of modern machinery in their production capacity.[3] The CBR report concludes that the industries with best potential for increasing output supported by high-tech equipment were wood processing, metal and food industries. Sanctions restrict, however, the export demand for many goods produced in these industries.

The cut in import supply has boosted prices. The CBR survey found that 40–60 % of companies (depending on the industry) expected their production and logistics costs to increase in 2023 due to sanctions (Karlova & Puzanova, 2023). The Gaidar Institute survey from early 2024 found that over half of respondents reported higher costs after restrictions on exports to Russia (Kommersant, 2024).

Reducing import dependence and improving domestic production capacity is also associated with R&D and innovation. Russia's recent trends in this respect are hardly encouraging. According to the latest HSE figures, the share of innovative products has declined both in the domestic sales and exports of Russian companies already for years (Vlasova et al., 2024). In 2015, the share of innovative products was found to account for 8 % of domestic sales. In 2022, it was 5 %. The value of exports of innovative products was in 2022 lower than in 2017 even measured in nominal rubles.

In the industries classified as having high- or medium-high technological intensity, 70–75 % of innovations in 2022 were only new for the innovating company, not the rest of the world. The share of internationally new innovations in high-tech industries was 0.1 %.

Another HSE analysis found that Russia performs modestly in international comparison for most-cited researchers (Tyurtchev et al., 2024). In 2023, only 8 researchers working in Russia were named among the nearly 7,000 most frequently cited researchers. By this indicator, Russia lagged both India and Brazil (22 researchers each) and South Africa (10 researchers).

Since Russia's full-scale invasion of Ukraine and the resulting restrictions from sanctioning coalition countries on exports to Russia, the main solution for Russian companies has been to find alternative import suppliers. However, the use of domestic suppliers has increased, particularly in strategically important industries. There would be more demand for appropriate domestic alternatives, but capacity constraints and quality considerations are key problems. Failing import substitution is considered a key bottleneck for the Russian military industry (Bilousova et al., 2023; Luzin, 2023a; Snegovaya et al., 2024).

3. Import substitution in the light of statistical data

We analyze recent developments in Russian import substitution in a sample of 22 goods produced by the electronics and electrical equipment industries. The selection of goods is based on data availability. For these particular items, monthly production data is readily available from January 2017 to March 2024. Moreover, production data are presented at a sufficiently fine level of disaggregation that they can be mapped into foreign trade data.[4] Some production data are expressed in rubles and others in physical quantities. For trade, we only use data in value terms due to limited

[3] For a more detailed analysis of Russian investment in recent years, see Simola (2024).

[4] To maximize comparability, we focus on such items of OKVED classification that correspond to up to 4 product lines of the HS-6 classification.

availability of data in volumes. As Russia has ceased to publish detailed foreign trade statistics, we sum up exports of all countries to Russia to get an estimate of Russia's imports.

There are obviously several caveats related to the analysis. It is difficult to assess from our small sample of goods whether our results can be generalized to Russia's electronics and electrical equipment industries overall. Output data are typically quite volatile at a disaggregate level, making it more difficult to identify trends. Much of the production data is only available in nominal ruble terms. If output value grows, we cannot distinguish the effect of price increases. As noted by Luzin (2023b), higher prices can account for a large part of output value growth. Finally, it is difficult to evaluate the reliability of Russian production data for these goods. While we have no evidence of large-scale manipulation of the aggregate data, there is no dispute that uncertainty associated with Russian statistics has increased since the invasion of Ukraine.

Our analysis suggests that there have been various trends for the availability of technology products in Russia. For the majority of the examined goods, the value of Russian imports has sharply declined over the past two years,[5] while domestic output has been stagnant. For a few items, domestic supply has grown, but not enough to compensate for the lost imports. The apparent supply for these goods was substantially lower at the start of 2024 compared to 2022. A third group of goods shows practically no change in production and imports after the invasion of Ukraine. Finally, there are a few items for which domestic output has sharply increased and more than compensated for the lost imports.

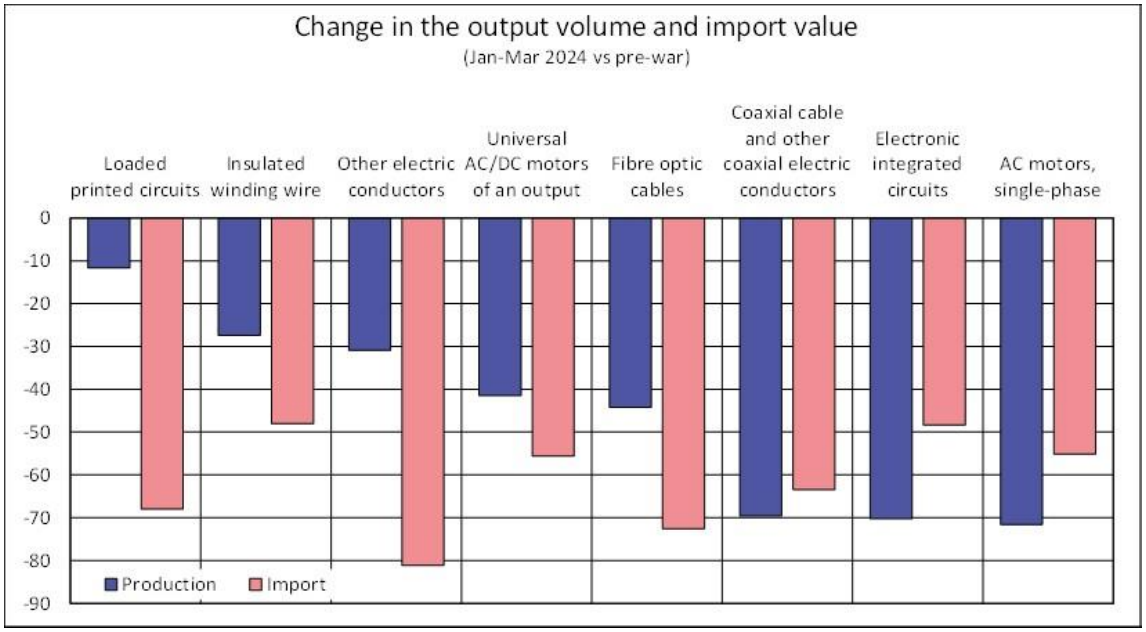
There are no clear trends related to complexity of the goods and their import substitution.[6] For example, we find no import substitution in the technologically least complex item, cables, but we also find no substitution for more complex tungsten-halogen filament lamps. On the other hand, relatively complex goods such as reception apparatus show signs of import substitution taking place.

The majority of examined goods (9 items) can be classified into the category *no import substitution*. For these goods, imports have substantially declined after Russia's invasion. Domestic output volume has remained stable or declined, leading to a notable reduction in the total supply of these goods. These goods include circuits, coaxial cables and AC motors (Figure 2). Tungsten-halogen filament lamps also belong in this category, but for these items domestic output collapsed already in 2021 and has not since recovered.

[5] For many sanctioned goods, Russia has, however, been able to find substitutes from other markets keeping the total import volume stable. For a more detailed analysis of Russian imports of sanctioned technology goods, see Bilousova et al. (2024) and Simola (2023).

[6] As defined by the Harvard Growth Lab product complexity ranking for 2021 (at the HS-4 level).

Figure 2. Change in the output volume and import value of selected goods, Jan-Mar 2024 vs. pre-war level.

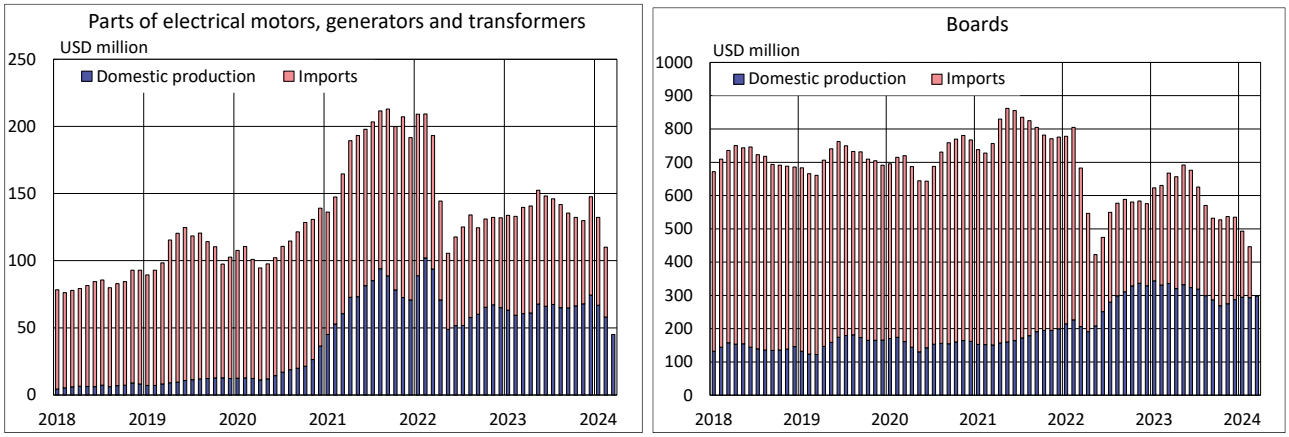


Sources: Rosstat, CEIC, Global Trade Tracker.

We classify five goods in the *no impact from the war* category. We do not detect notable changes in the development trends of domestic production for most of these goods. For cards with magnetic stripe, the share of imports has been tiny in recent years. Even though imports have dried up, the lost supply was covered with a small increase in domestic output. Regarding electric accumulators, there has been no need to increase domestic production as imports have not declined. For multi-phase AC motors, both imports and domestic production have remained relatively stable even after Russia's invasion. We also include in this category transmission apparatus incorporating reception apparatus. Their domestic output increased sharply after mid-2022. But the share of imports was very low already in the years preceding the war, so from the viewpoint of import substitution there was practically no change after Russia's invasion.

For 2 goods, we find *some import substitution*. Imports of these goods have sharply declined in the past two years. Domestic production has grown, but this growth has not compensated for all of the lost imports (figure 3). For parts of electrical motors, the import substitution development mainly occurred at the aftermath of the Covid-20 crisis in late-2020. For boards, the most prominent effect is visible after Russia's invasion. We only have data in value terms, however. In value terms, the total supply of these products was 45-50 % lower in the first months of 2024 compared to the months preceding Russia's invasion. At the same time, prices have gone up in Russia quite rapidly. At the industry level producer prices in manufacturing of electrical equipment have risen by 22 %. Therefore it is likely that the decline in total supply is even larger in volume terms.

Figure 3. Monthly value of domestic production and imports of parts of electrical motors and boards in 2018-2024.



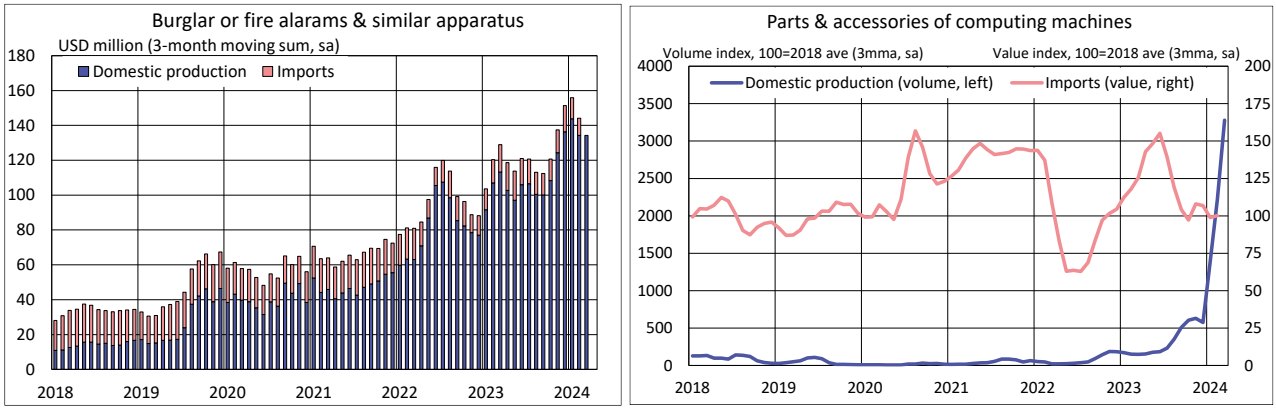
Sources: Rosstat, CEIC, Global Trade Tracker.

Our analysis identifies 6 items for which *domestic output has substantially increased* and imports declined since Russia's invasion. These goods include transmission and receiving apparatus, alarm apparatus, lead-acid accumulators, parts and accessories of computing machines and thermostats. For most of these goods, however, the output is reported only in nominal rubles. It is probable that a large part of the growth reflects higher prices, but we cannot distinguish the price effects. Nevertheless, growth in the value of output is so rapid (100–700 % in two years), it seems implausible to assume that the increase could solely reflect price effects – at least for all products.

For alarm apparatus, the share of imports in supply had been declining already before the war. Nevertheless, there was a further sharp drop in import share after Russia's invasion combined with a sharp increase of total supply enabled by increasing domestic production (Figure 4A). For transmission apparatus not incorporating reception apparatus, the replacement of imports occurred before the war. For thermostats and reception apparatus, the declining imports after Russia's invasion have been replaced by increasing domestic production. However, in the case of thermostats alone, the value of output has clearly climbed to historically high levels. For reception apparatus, the value of output has barely exceeded the pre-covid level, with imports still accounting for the bulk of supply.

Output of lead-acid accumulators and parts & accessories of computing machines is reported in units. Following a decline in the value of imports, there was a sharp jump in the level of output in the start of this year for parts & accessories of computing machines (Figure 4B). This points to at least some import substitution, although it is difficult to draw conclusions comparing units of parts & accessories and value of imports.

Figure 4. Monthly output and value of imports of alarms and parts & accessories of computing machines in 2018-2024.



Sources: Rosstat, CEIC, Global Trade Tracker.

4. Conclusions

Russia has long aimed at producing domestic substitutes for imports. This goal has been even more pronounced since Russia's invasion in Ukraine and the expansion of sanctions. In the years before the invasion, Russia's success of import substitution had been quite limited. While examination of recent developments is challenging due to data limitations, our analysis suggests that Russia has mainly replaced imports lost due to sanctions with imports from other countries. This has often led to higher costs and sometimes to poorer quality and efficiency of production. Russia is particularly dependent on technologically sophisticated imports. This makes import substitution even harder for Russia in light of the country's weak track-record in most high-tech sectors and technological innovation. For many products, sanctions appear to have reduced supply in Russia. For certain goods, there are signs of Russian success in import substitution, both before and since the invasion of Ukraine.

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