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Trade sanctions and Russian production



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Abstract

The EU, US and several other countries have responded with a wide range of new economic sanctions on Russia in response to the military attack on Ukraine. These sanctions include various restrictive measures on trade with Russia. In this brief, we examine the potential short-term effects of trade sanctions on Russian production with an input-output framework. We find that the trade sanctions can have substantial negative effects on Russian production when Russia is unable to find alternative markets for imports and exports.

Keywords: Russia, trade, sanctions, input-output

1. Introduction

The EU, US and other advanced economies have imposed a wide range of additional economic sanctions on Russia after its brutal military attack on Ukraine. The new sanctions include restrictive measures on financial flows and trade with Russia. In this policy brief, we assess potential short-term effects of the trade sanctions in a simple input-output framework. We also construct some hypothetical scenarios with more severe trade sanctions on Russia, including a total decoupling of Russia from the global economy.

Foreign trade is important for Russia, and its trading partners in advanced economies account for most of that trade (Korhonen & Simola, 2022). In short-term, replacing import or export markets is typically difficult, even if feasible in longer term. To illustrate the potential short-term effects of the trade sanctions imposed on Russia, we use the traditional input-output framework taking into account the interlinkages between sectors. We then separately consider the channels of export and import restrictions. To complement previous analyses, we examine the effects also on a more disaggregate industry level.

We utilize the multi-regional input-output table for 2019 (reported in current USD) compiled by the Asian Development Bank (ADB) for the analysis. The table includes 62 economies (mainly in Europe and Asia) and 35 sectors that cover both goods and services. The input-output table is based on official statistical data that has been augmented with estimated inputs. We examine the effects of export restrictions in Section 2 and focus on import restrictions in Section 3. Section 4 provides a brief discussion on the results and concluding remarks.

2. Sanctions restricting exports to Russia

To evaluate the potential effects of the sanctions restricting exports from advanced economies to Russia, we construct three scenarios. The first depicts the current sanctions regime. The second considers a situation where the ban on advanced economy exports to Russia extends to all goods and services. Finally, we construct an extreme scenario in which Russia is totally cut off from global imports.

Within the current sanction regime, the EU, US and UK have banned exports of military and dual-use items, various technology products and luxury goods to Russia. Several other advanced economies have at least partly joined these sanctions or committed to prevent their circumvention.

As the input-output data are on a relatively aggregate level, we proxy the current sanction regime by assuming that exports to Russia are ceased from countries imposing sanctions in the branches of machine building, electric and electronic equipment, transport equipment, air transport, financial intermediation and business services. For simplicity, we also assume the EU countries, US, UK, Switzerland, Norway, Australia, Canada, Japan, Korea and Taiwan all cease exports to Russia in these categories. For brevity, we refer to this group as “advanced economies.”

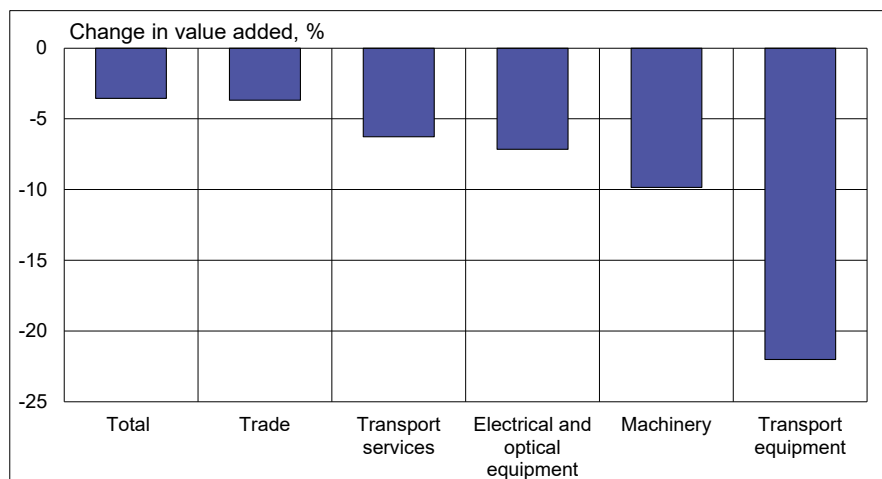
We calculate the share of imports from these countries and industries in Russian output across all production sectors. For simplicity, we assume that term these inputs cannot be replaced at all from domestic supply or imports from other countries in the short term. Thus, output falls in proportion to lost inputs. We then calculate the propagation of this output fall to other industries through production network linkages to evaluate the effect on total output and value added.¹

Our results suggest that the current regime of banned exports to Russia could lead to a decline of nearly 4 % in total Russian value added (Figure 1). The industries most affected are transport

¹ The methodology follows standard input-output analysis as presented e.g. in Simola (2019).

equipment manufacturing, machine building and manufacturing of electric equipment. Within the service sector, the largest declines are experienced by transport services and trade.

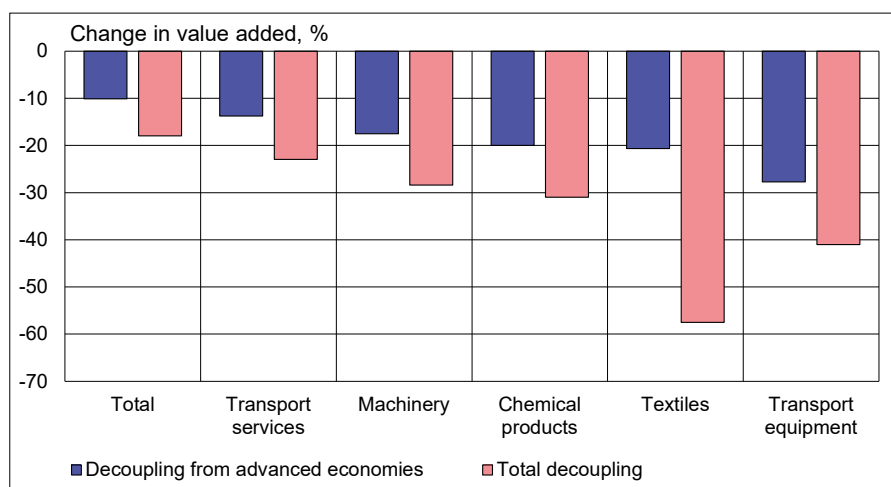
Figure 1. Estimated effects of the current sanctions regime of advanced economies on Russia’s total value added and select most-affected sectors.



Source: Author’s calculations based on ADB MRIO data.

In the second scenario, we assume a complete ban on exports from advanced economies to Russia. The results suggest that such cut in imports would lead to a decline of 10 % of Russia’s total value added (Figure 2). In industry terms, in addition to the branches noted above, the effects would also be severe in e.g. manufacturing of rubber and plastic products as well as the chemical industry. The value added of these branches could decline by 20–30 %. In our extreme third scenario, we assume that Russia is entirely cut off from foreign inputs. This would imply a decline of 18 % in Russian GDP. In addition to industries noted above, the textile industry would suffer severely due to the loss of access to imported inputs.

Figure 2. Estimated effects of Russia’s decoupling of imports from advanced economies and all economies on Russia’s total value added and select sectors.



Source: Author’s calculations based on ADB MRIO data.

3. Sanctions restricting imports from Russia

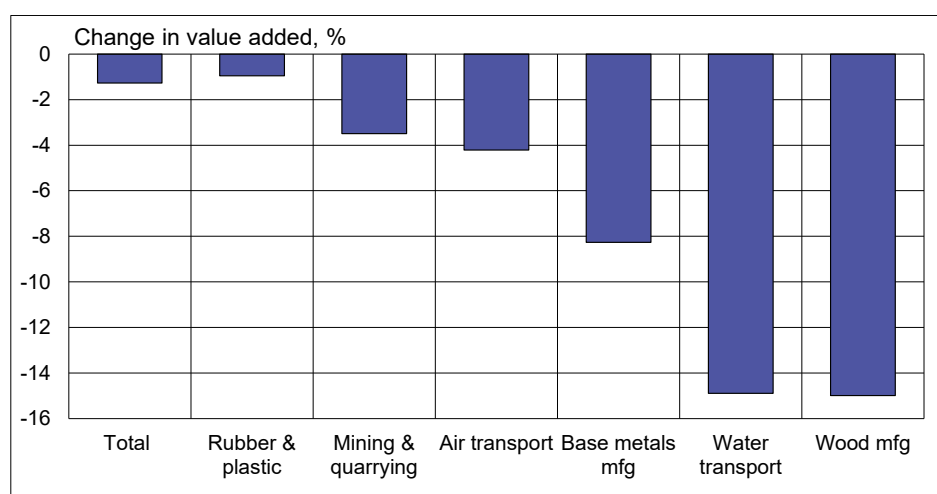
Most advanced economies have imposed sanctions restricting imports from Russia. Here, we 1) evaluate the effects of the current import sanction regime on Russian production, 2) construct a scenario with advanced economies banning all imports from Russia, and 3) construct a scenario where Russian exports are totally excluded from the global market.

The current sanction regime displays variation across countries concerning import restrictions. The US, Australia and Canada have banned imports of oil, petroleum products, natural gas and coal from Russia. The US has also banned imports such as diamonds and seafood. The UK, which is set to cease imports of oil and petroleum products from Russia, has also imposed additional import tariffs on various Russian goods. The EU has banned imports of certain steel products and coal from Russia starting in August 2022. Import of various other commodities, e.g. raw wood, is also banned. Russian seaborne and road transport is prohibited in EU countries. Several advanced economies have even closed their airspace from Russian carriers.

We construct our scenarios in a similar manner as for exports to Russia above. We first calculate the share of Russian production in an industry that is destined to foreign countries (either for intermediate use or to satisfy final demand). After the import bans are imposed, this share of output is assumed to be simply cut as alternative export markets are unavailable in the short term. We then calculate the propagation of these output shocks across the Russian economy.

Again, the sanctions cannot be depicted in detail in our framework due to the level of aggregation of the data. To proxy for the current sanctions, we assume that all imports from Russian mining and quarrying as well as petroleum refining sectors to Australia, Canada, US and UK cease. In addition, imports from Russian sectors of wood manufacturing, base metals manufacturing and transport services to EU countries also cease. Our results suggest that these restrictions lead to a decline of 1 % in Russia's total value added (Figure 3). Unsurprisingly, the industries suffering the most are those directly subject to sanctions. Industries experiencing the sharpest indirect effects include rubber and plastic manufacturing and wholesale and retail trade.

Figure 3. Estimated effects of Russia's current bans on imports to advanced economies on Russia's total value added and most effected industries.

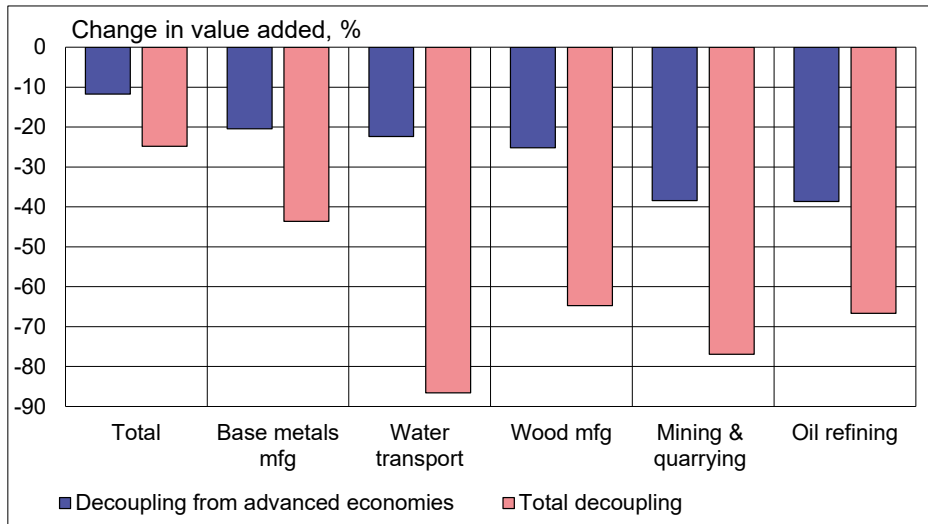


Source: Author's calculations based on ADB MRIO data.

Next, we construct our scenario with all advanced economies banning all imports from Russia. Our results suggest that this would lead to a decline of 12 % in Russia's total value added (Figure 4).

Unsurprisingly, as Russia is a major oil and gas exporter, the industries hardest hit include mining & quarrying and oil refining. Other branches with sharp declines are wood and base metals manufacturing and transport services. Finally, in the most extreme scenario with total decoupling of Russia from global export markets, Russia's total value added declines by 25 %. The industries suffering most remain the same, but the declines in value added are naturally larger in the extreme scenario.

Figure 4. Estimated effects of decoupling of Russian exports to advanced economies and all economies on Russia's total value added and select industries.



Source: Author's calculations based on ADB MRIO data.

4. Concluding remarks

Our analysis shows that the trade sanctions can have substantial negative effects on Russian production in the short-term when alternative markets for exports and imports are unavailable. Medium-high and high-technology industries are set to suffer most from a ban on exports to Russia. A ban on imports from Russia hits hardest commodity branches such as mining, oil refining and wood manufacturing.

The analysis is merely intended to be illustrative, as it is subject to important caveats. It picks up separate channels individually, not taking into account potential interactions. In addition, price effects cannot be taken into account in the simple input-output framework. There could also be additional spillover effects related to financial market developments. The importance of these other channels on Russian GDP is evaluated, for example, by Korhonen & Kortelainen (2022).

While certain imports could reasonably be replaced by domestic production, import substitution is impractical or impossible for Russia in many cases (Simola, 2022). At least currently, it also seems that the most extreme scenario of total decoupling of Russia from the global economy is unlikely. Thus, emerging economies could provide some replacement as import and export markets for Russia even if advanced economies decide to impose expand trade sanctions even further.

For comparison, Felbermayr et al. (2022), Langot et al. (2022) and Mahlstein et al. (2022) examine the aggregate level effects of the decoupling of Russia in a more dynamic set-up and different datasets. Their results are similar to ours qualitatively, but the negative effects are quantitatively smaller due to switching of trade flows to emerging markets.

Felbermayr et al. (2022) find that a halt in most exports to Russia from advanced economies leads to a decline of 5 % in Russian welfare and that a halt in majority of Russian imports to advanced economies leads to a decline of 7 %. If both restrictions are applied simultaneously, Russia's welfare loss amounts to about 10 %. Mahlstein et al. (2022) find that a trade embargo on Russia by advanced economies combined with a partial withdrawal of FDI and higher trade costs for Russia would cut Russia's GDP by 14 %. Langot et al. (2022) find that a ban on imports from Russia imposed by advanced economies reduces Russian GDP by 3 %. Their results suggest that a total cut-off of Russian imports and exports from the global economy causes a 33 % drop in Russian GDP.

Thus, Russia can eventually alleviate the negative effects of sanctions, but it requires time and alternative markets for exports and imports. In the short term, Russia faces a risk of sharp fall in production across several sectors with the trade sanctions imposed by the advanced economies. The fall would be even more precipitous if also emerging economies joined the sanctions.

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