

Simola, Heli

Research Report

Made in Russia? Assessing Russia's potential for import substitution

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BOFIT Policy Brief 2022 No. 3

Heli Simola

Made in Russia? Assessing Russia's
potential for import substitution



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Made in Russia? Assessing Russia's potential for import substitution

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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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Heli Simola

Made in Russia? Assessing Russia's potential for import substitution

Abstract

Russia's brutal military aggression on Ukraine has led to extensive economic sanctions by Western countries and the withdrawal of many foreign companies from Russian markets. The isolation of Russia from the international community has substantially restricted its access to advanced technologies and eroded the country's economic growth potential. Our analysis suggests that Russia has fairly limited possibilities for import substitution in high-technology sectors. China, which could play a key role as an alternative source for inputs, has seen its share of Russian imports, including high-tech inputs, increase substantially in recent years. The extent to which China is willing to support Russia in the current situation remains unclear, however.

Keywords: Russia, trade, sanctions, import substitution

1. Introduction

Russia's brutal military aggression on Ukraine has caused many Western countries to impose export bans on select goods as a part of extensive, coordinated economic sanctions.¹ The export bans largely concern investment goods and their components, particularly high-technology goods and services. The goal of such sanctions is to make it more difficult for Russia to maintain its military capabilities and pursue economic development.

Besides sanctions, hundreds of foreign companies have ceased doing business with Russia at their own initiative.² This refusal extends not just to sales of products and services, but transport flows to Russia as well. Western sanctions related to Russian banks and certain corporations substantially complicate payments between Russian and foreign entities. Taking all these factors into account, Russian imports are set to decline substantially this year and remain at a depressed level in coming years.

Russian economic policy has promoted self-sufficiency in certain sectors already for years. Import substitution became a key economic policy target after Russia's illegal annexation of the Crimean peninsula in 2014. To insulate itself from sanctions, the Russian administration has presented numerous plans and objectives for substituting imports with domestic production. The most concrete action was Russia's import ban on various foodstuffs imposed in 2014 as a countermeasure to Western sanctions (Simola, 2021).

Russia also declared a "pivot to the East" policy in 2014 intended to reduce dependence on Western countries. A key manifestation of the pivot was the finalization of a natural gas export deal with China that had been negotiated for years. Prior to the Ukraine invasion, Russia and China had declared their mutual intention to increase bilateral trade substantially.

This brief examines Russia's advancement and further potential for import substitution and redirection of imports from advanced economies to China and other emerging economies that have not joined in the economic sanctions against Russia. Section 2 reviews the development of Russia's import dependence in general. Section 3 focuses on the dependence of Russian production on imported inputs. I also assess Russia's import substitution potential from various viewpoints. Section 4 details the evolution of geographical distribution of Russian input imports with a special focus on the role of China. The final section provides concluding remarks.

2. Russia's import dependence and production structure

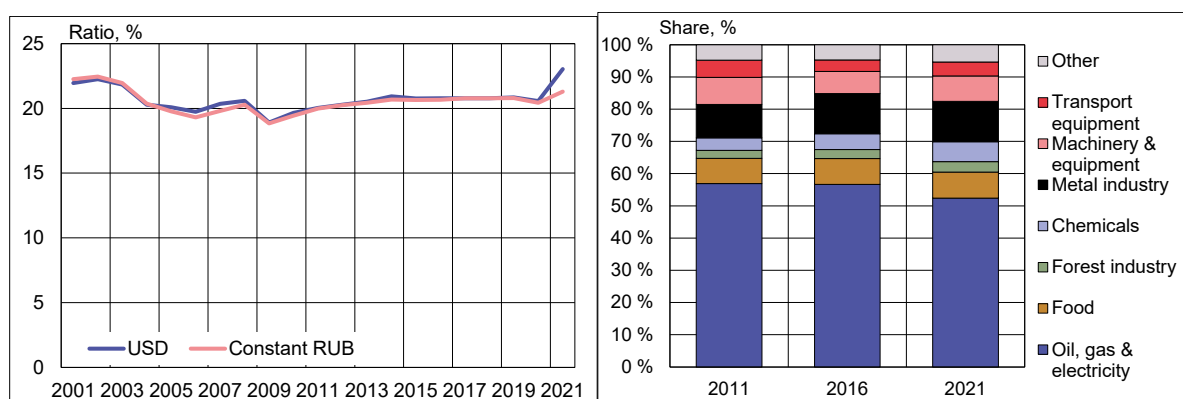
The value of Russian imports in USD declined between 2013 and 2021. It was not an indication of import substitution, but weak economic development and substantial ruble depreciation. Relative to GDP, Russian imports have remained relatively stable at around 20 % throughout the past two decades both in terms of USD and constant rubles (Figure 1, panel A). The ratio of imports to GDP last year was the highest in nearly 20 years. The structure of Russian production, exports and imports has remained quite stable in the 2000s.

¹ The sanctions regime is coordinated by the EU, US and UK. Practically all advanced economies now participate in sanctions regime to some extent.

² Yale University posts a continuously updated list of companies that have curtailed operations in Russia: <https://som.yale.edu/story/2022/over-600-companies-have-withdrawn-russia-some-remain>

The energy sector accounts for over half of Russia's industrial production (Figure 1, panel B).³ That share declined slightly in 2020 and 2021 due to a substantial decline in Russia's oil production as part of Russia's OPEC+ agreement commitments. Several low-technology manufacturing sectors such as wood processing and basic metals manufacturing have slightly gained shares. Correspondingly, the shares of medium- and high-technology sectors such as machinery & equipment have declined slightly over the past decade. A notable exception is the pharmaceutical industry, which saw its share doubled between 2011 and 2021. Even so, it only accounted for 1.4 % of Russian industrial production in 2021.

Figure 1. Panel A: Ratio of imports to GDP in Russia in 2001-2021. Panel B: Structure of Russia's industrial production in 2011–2021 (in constant prices).



Note: Industrial production covers mining & quarrying, manufacturing and electricity & gas supply.

Sources: Central Bank of Russia, IMF, Rosstat.

The product structure of Russia's foreign trade has changed little during past decades. Russia's exports are dominated by energy commodities and other raw materials (Figure 2, panel A). Russian imports mainly consist of investment and consumer goods and components required for their production.

The *geographical structure* of Russia's foreign trade, particularly imports, has changed notably in past decades. China now provides a much larger share of Russian goods imports. This partly reflects the growing importance of China in global trade, but China's share has increased even more in Russian imports than the rest of the world. In 2002, China accounted for about 5 % of total global goods imports,⁴ as well as a similar share of goods imports for Russia. By 2021, China's share of global imports had risen to 15 % and 25 % of Russian imports. China's share of 25 % makes Russia, along with Cambodia and the Kyrgyz Republic, one of the most dependent countries on Chinese imports. China's share in Russian imports is also higher than for other emerging economies (e.g. 21 % for Thailand, 9 % for Turkey).

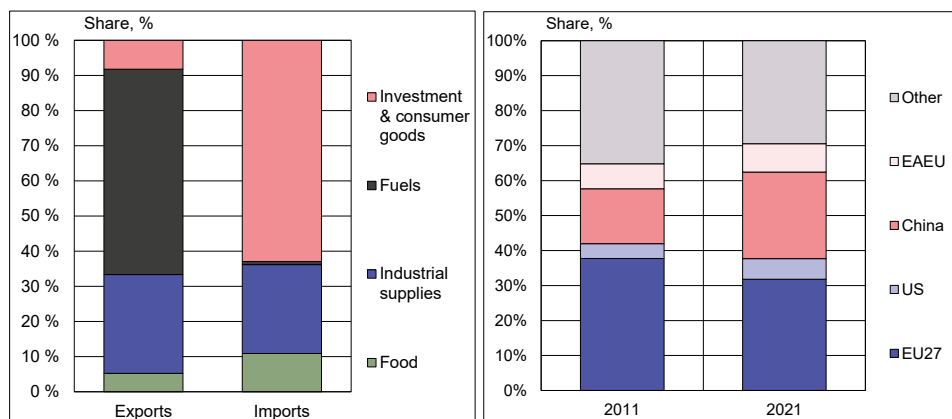
Between 2002 and 2021, the shares of the US and the Eurasian Economic Union (EAEU) member countries in Russian goods imports only increased slightly.⁵ The EU's share declined to 32 % in 2021. Countries in the "rest of the world" category also lost shares in Russian imports over the past decade.

³ Energy sector refers to mining and quarrying, manufacture of coke and refined petroleum products and electricity & gas supply.

⁴ This refers to the combined imports of all countries from China in relation to the combined imports of all countries from all other countries. It thus depicts China's global market share in goods trade.

⁵ The EAEU currently comprises Armenia, Belarus, Kazakhstan, Kyrgyz Republic and Russia.

Figure 2. Panel A: Product structure of Russian goods exports and imports in 2019. Panel B: Geographical structure of Russian goods imports in 2011 and 2021.



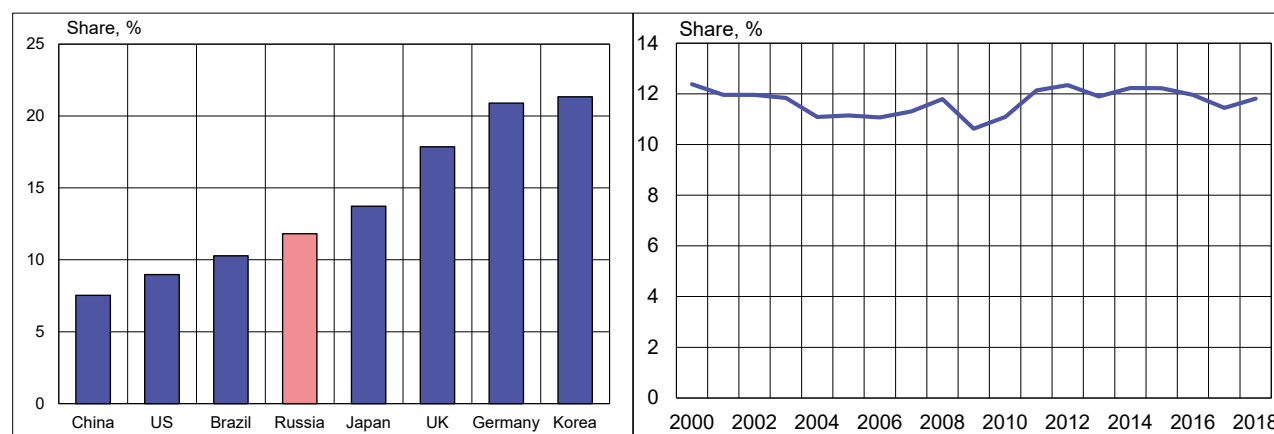
Sources: World Bank WITS, Russian Customs.

3. Import dependence of Russian production

At the aggregate level, Russian production is not highly dependent on imported inputs. Typically, smaller economies and economies that are more deeply involved in global value chains rely more on imported inputs. Russia, a relatively large economy, participates in global value chains only in limited terms. It is heavily focused instead on commodity exports. In 2018, the share of imported inputs in Russia’s total use of intermediate inputs was 12 % (Figure 3, panel A), which was slightly higher than for Brazil or the US, but much smaller than for strongly export-oriented countries such as Germany or Korea.

The aggregate share of imported inputs in Russian production has remained practically unchanged in the 2000s (Figure 3, panel B). The share of imported inputs in Russian production was the lowest during the global financial crisis in 2009 at around 10 % but rapidly rebounded to around 12 %. The share has remained stable after that despite Russia’s announcement of shifting to import substitution policy in 2014 after Russia’s illegal annexation of Crimean Peninsula and increased tensions with the Western countries.

Figure 3. Panel A: Share of imports in total use of intermediates in selected countries in 2018. Panel B: Evolution of the share of imported inputs in Russia in 2000–2018.



Note: Share of imported intermediates in total intermediate consumption across all sectors, calculated from an input-output table.

Source: OECD.

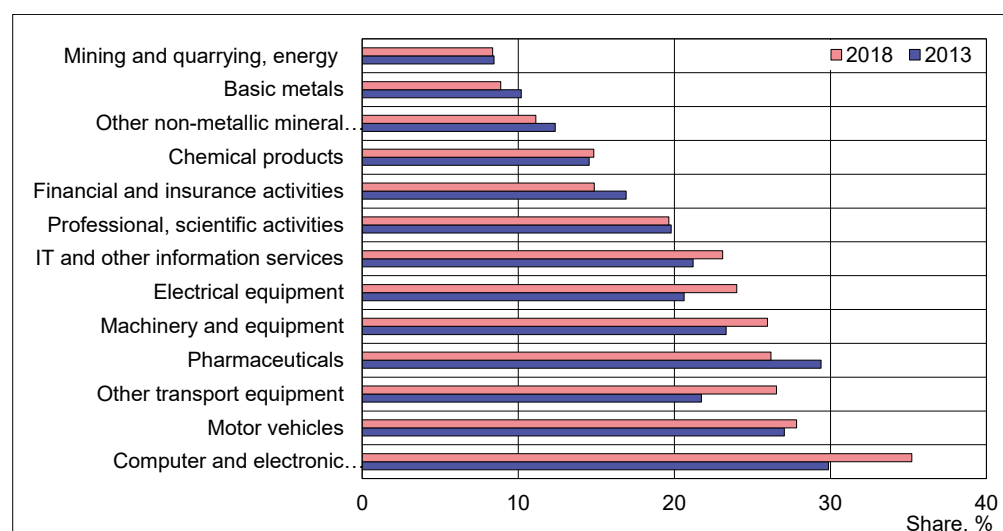
3.1 Russia relies heavily on imported inputs in high-technology

3.1.1 Machinery & equipment manufacturing sector most dependent on imported inputs

Among end-use industries in Russia,⁶ the most dependent on imported inputs are medium- and high-technology branches such as computer and electronic equipment, motor vehicles and other transport equipment, pharmaceuticals and machine-building. In these branches, the share of imported inputs ranged from 26 % to 35 % in 2018 (Figure 4). For comparison, the 2018 share of imported inputs was 20 % in the computer & electronics industries in the US and Japan and 37 % in Germany. In Russia's service sector (i.e. a sector typically less dependent on imported inputs), the share of imports was 20 % for IT and information services as well as professional and technical services. On the other hand, the share of imported inputs was small in energy mining and basic metal manufacturing, reflecting Russia's vast natural resource base.

The share of imports has increased in recent years in several import-dependent industries, most notably "other transport equipment," a branch that includes production of various military equipment. Pharmaceuticals have bucked the general trend with a declining share of imported inputs in recent years. In branches less reliant on imports, the share of imports has remained relatively stable or declined in recent years. In the service side, the share of imports has declined in the financial sector. Western countries imposed several financial sector sanctions on Russia in 2014.

⁶ We aggregate all of the Russian production sector's imported inputs and calculate their ratio to total input use of the sector. Thus, this figure includes all types of imported inputs, including raw materials, components and services.

Figure 4. Share of imported inputs by Russian end-use industries in 2013 and 2018, %.

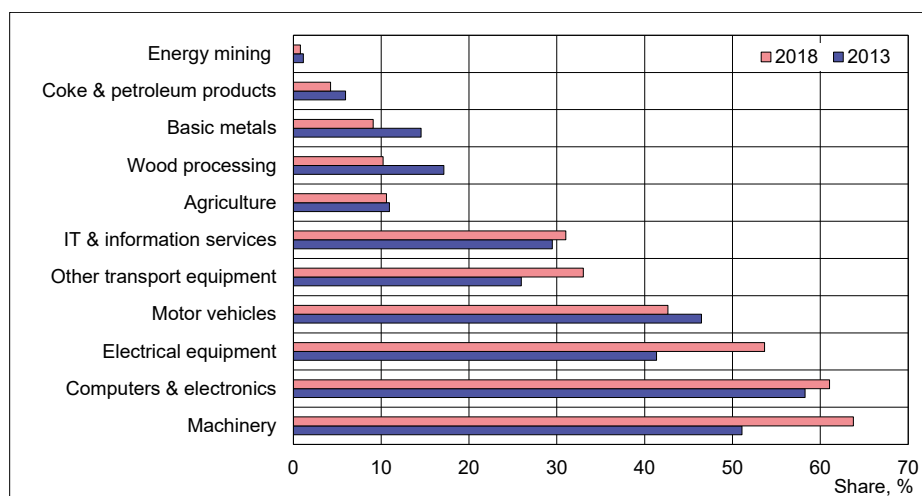
Note. Share of all imported intermediates in total intermediate use of the Russian production sector.
Source: OECD Input-Output tables.

3.1.2 Russia relies on imports particularly for machinery and equipment

Russia is even more dependent on imports for certain types of inputs.⁷ This concerns inputs originating from branches producing machinery, computers, electronics and electrical equipment. The share of imports in inputs from these branches ranged between 50 % and 60 % in 2018 (Figure 5). For comparison, the share of imported machinery inputs was 20–30 % for Germany, Japan and the US in 2018. Among service inputs, the share of imports is relatively high in Russia for IT and information services at 31 %. As expected, the share of imports is the lowest in inputs produced by energy mining, basic metals and wood manufacturing.

Russia's dependence on imported inputs from high-technology branches has risen in recent years. The increase has been particularly pronounced for machinery and electrical equipment. Russia's import dependence on inputs provided by these sectors increased by 12 percentage points between 2013 and 2018. The share of imports has increased also slightly in IT service inputs. In contrast, the share of imports has slightly declined in inputs from the motor vehicles branch, suggesting progress in localization of car production in Russia. The share of imported inputs has declined substantially for lower-tech branches such as base metals and wood processing.

⁷ We aggregate imports for a particular branch that are used in production of all Russian production sectors and calculate their ratio to total inputs from this sector in all Russian production sectors. The resulting indicator shows e.g. the share of imported machinery in the total machinery used in the Russian production sector.

Figure 5. Share of imports in Russian production by input manufacturing industry in 2013 and 2018, %.

Note: Share of imports in the use of intermediates from a branch in Russian production across the entire production sector.

Source: OECD Input-Output tables.

3.2 Import substitution's weak track record in Russia

3.2.1 Limited success in the agricultural sector

The most prominent example of import substitution policy in Russia is the agricultural sector. Agriculture was chosen as a priority development sector in 2005 and self-sufficiency targets for certain food categories were officially introduced in 2010. Import substitution was further supported by imposing import bans in 2014 on certain food products originating from Western countries. The bans effectively stopped a large part of Russian food imports, giving room to promote domestic production. Domestic agricultural production enjoyed additional support from the substantial ruble depreciation of 2014–2015 (Korhonen et al., 2018).

There are only a handful of studies that attempt to assess the consequences of Russia's import restrictions. The general conclusion is that the halt in food imports raised consumer prices and reduced consumer welfare in Russia. There is some variation across products, however. Import substitution is considered successful for products such as pork and poultry as domestic production has increased without leading to permanent increase in prices. For products such as cheese and fish, consumption has declined and prices have increased. To some extent, imports from Western countries have just been replaced by imports from other countries instead of increasing domestic production. In certain food products, Russia has fulfilled its self-sufficiency targets, but not in all products. Russia's grain production has increased substantially in recent years even though imports of grain products have not been restricted. It now ranks among the world's top grain exporters, although grain imports have not been banned (Hinz & Monastyrenko, 2021; Kuznetsova & Volchkova, 2019; Wegren & Elvestad, 2018).

Russia's success in import substitution of foodstuffs has been limited and the import substitution attempts have generally led to an increase in food prices. Even if agriculture had long been a stated priority sector and the import bans and ruble depreciation have served to shelter for domestic producers from competition. Food production is a low-tech sector and thus generally not very difficult to develop (obviously, depending on geographical conditions). It is far more challenging

to develop high-tech industries, especially when faced with limited availability of machinery, spare parts and services needed to develop production systems.

3.2.2 Limited potential for replacing imports by reorienting exports

One indicator to assess Russia's capability for import substitution is to compare Russian exports to its imports. Exports could be reoriented to domestic demand in order to replace imports. President Putin has commented on this possibility, and Russia has, in fact, restricted certain exports such as various food products and previously imported machinery and equipment. These restrictions have been motivated in part by a desire to improve the availability of these goods in domestic markets.

Substituting imports, especially those from Western countries, by reorienting exports is complicated by the substantial mismatch of the product structure of Russian imports and exports. Looking at the top-30 Russian import products in the machinery, equipment & vehicle category shows that Russian exports are typically minor compared to imports of these products (Table 1).

The simple average of the export-value-to-import-value ratio across the top-30 import items in the HS-6 classification (most detailed product level available) was 8 % in 2020. The ratio varied between 1 % and 22 % across goods, implying that at most 22 % of imports could even potentially be replaced by reorienting exports. Such analysis is obviously subject to caveats, but it gives some idea of the challenges facing Russia's import substitution policy, particularly in the technology arena.

Table 1. Ratio of Russian export value to import value for the top-30 input imports in the machinery, equipment & vehicles category in 2020.

HS-6 product	Exports as a share of imports, %	HS-6 product	Exports as a share of imports, %
Pumps; centrifugal	22.2	Therapeutic respiration apparatus	6.4
Mechanical shovels, excavators	22.1	Communication apparatus	5.3
Engines; compression-ignition	16.0	Units of automatic data processing	4.8
Reception and transmission apparatus	15.9	Vehicles; parts and accessories	4.6
Boards, panels, consoles, desks	15.7	Telephone sets and other apparatus	4.4
Taps, cocks, valves	15.0	Machinery, plant and laboratory equipment	3.9
Vehicle parts and accessories	13.9	Headphones and earphones	3.8
Machines and mechanical appliances	13.5	Medical, surgical or dental instruments	3.8
Engines; reciprocating piston engines	12.4	Vehicle parts; gear boxes and parts	3.8
Vehicles; bodies (including cabs)	11.4	Telephones for cellular networks	3.2
Electrical static converters	9.5	Electronic integrated circuits	2.6
Pumps and compressors; for air	8.6	Machinery; parts and accessories	1.6
Vehicle parts; road wheels	8.3	Units of automatic data processing	1.4
Vehicle parts; brakes, servo-brakes	7.8	Automatic data processing machines	1.2
Vehicle parts; suspension systems	7.0	Distilling or rectifying plant	0.7

Source: World Bank WITS.

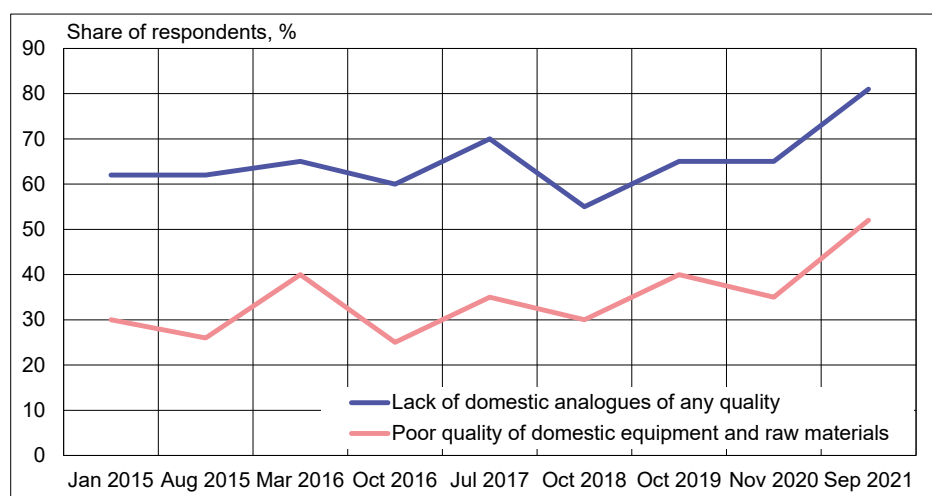
3.2.3 Surveys highlight problems related to import substitution

The findings of our data analysis are supported by recent surveys conducted by several Russian research institutes. In a company survey by a research institute of the Russian Academy of Sciences, respondents stated that they relied critically on imports for 50–60 % of the machinery used in their

production in 2020.⁸ Companies also said the situation was essentially unchanged from 2015, when import substitution policies were introduced.

81 % of respondents to company survey by the Russian Gaidar Institute for Economic Policy (IEP) in autumn 2021 said that they could not substitute imported inputs in their production because no corresponding Russian inputs of any quality existed (Figure 6). In addition, 50 % of respondents said that in those instances where Russian substitutes were available, the domestic good was typically of poorer quality than its imported counterpart. The shares of both of these answers were the highest in the history of the survey, which has been conducted since late-2014.⁹ In another IEP survey at the start of this year, half of Russian companies identified high machinery prices as a factor restricting their investment as they preferred to acquire Western machinery.¹⁰

Figure 6. Main factors hampering import substitution of Russian companies according to IEP company surveys conducted between 2015 and 2021.



Source: IEP/Kommersant.

Survey results published by the Central Bank of Russia in April suggest that only 10–20 % of Russian industrial companies, depending on the branch, were not dependent on imports in their production.¹¹ The survey indicated that 30–40 % of industrial companies were already having problems finding alternative suppliers for their imported inputs. The highest shares are reported by companies operating in the fields of machine-building, pharmaceutical production and mining & quarrying.

4. Geographical origin of Russia's imported inputs

Our analysis suggests that Russia's potential for substituting imports is limited. The Western sanctions prevent Russia from getting various technology products. Russia has to find alternative

⁸ [Критическая зависимость индустрии от импорта оборудования стабильно высока – Газета Коммерсантъ № 48 \(7249\) от 22.03.2022 \(kommersant.ru\)](#)

⁹ [Производители перечислили помехи импортозамещению – Газета Коммерсантъ № 180 \(7142\) от 05.10.2021 \(kommersant.ru\)](#)

¹⁰ [Ограничения инвестиционной активности промышленных предприятий в начале 2022 года \(Институт Гайдара\) \(ier.ru\)](#)

¹¹ [Доклад «Региональная экономика: комментарии ГУ» | Банк России \(cbr.ru\)](#)

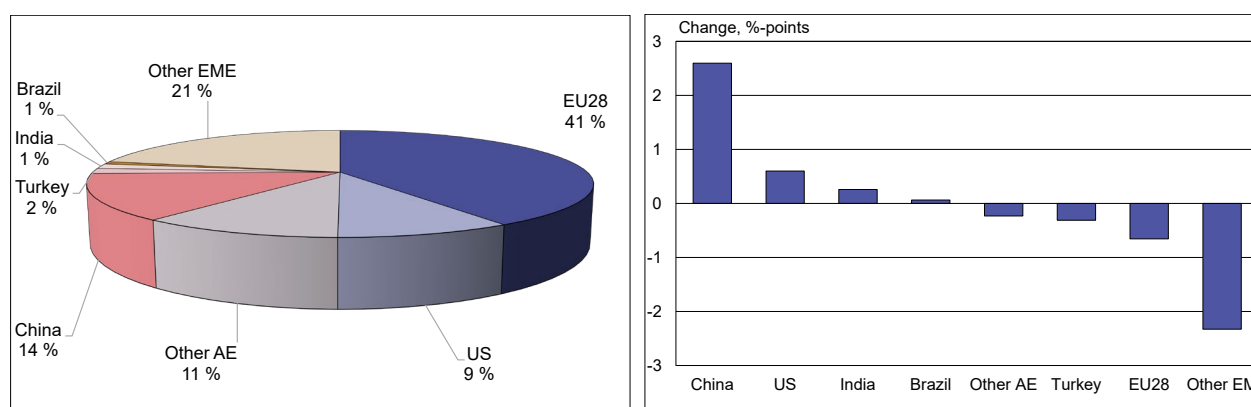
sources for these products. In this section, we review the geographical composition of Russia's input imports to evaluate the importance of lost imported inputs for Russian production and potential to replace them with imports from other countries.

We use the OECD Trade in Value Added (TiVA) data to examine the origin of Russian intermediate imports. The TiVA database readily provides the distribution of the value added in exports of countries.¹² We use the export distribution as a proxy for production in line with the proportionality assumption typically applied in constructing input-output tables.¹³

4.1 Despite a decreased share, the EU remains the top provider of imported inputs

The EU is the main provider of imported inputs for Russia. The EU-28 countries accounted for 40 % of Russia's intermediate imports in 2018 (Figure 7). The share of the US was 9 % and all advanced economies combined accounted for 60 % of Russia's input imports. Among emerging economies, China was the largest individual input supplier with a share of 14 %. The other largest emerging economies included in the TiVA database accounted only for 1–2 % of input imports. Russia also imports many inputs from CIS countries (particularly Belarus),¹⁴ but Kazakhstan is the only CIS member other than Russia included in the TiVA database.

Figure 7. Panel A: Russian input imports by origin in 2018. Panel B: Change in the import share of inputs in 2013-2018.



Note. The values are calculated as shares of the total foreign value added embodied in Russian gross exports. Other advanced economies (Other AE) include Australia, Canada, Iceland, Japan, Korea, New Zealand, Switzerland, Singapore and Taiwan. The rest of the world is depicted as the other emerging economies (Other EM).

Source: OECD TiVA.

The geographical distribution of Russian input imports has changed somewhat during the past years. The share of China, in particular, has increased. The share of the US has also increased slightly. On the other hand, the EU-28 share has declined slightly and the share of other emerging markets more

¹² Data is expressed in value-added terms. For example, value added originally generated in the US that was exported to Russia as a part of Chinese exports would be attributed to the US. This should give a better view of the current situation since the US has extended its ban on exports to Russia to products that embody certain inputs provided by the US.

¹³ According to the proportionality assumption, the use of imported inputs is assumed identical in all production irrespective whether it is destined for domestic consumption or exports. Notably, this assumption is used for most countries in the TiVA database, including Russia.

¹⁴ CIS stands for Commonwealth of Independent States and refers to a regional group of 12 former Soviet republics. The Baltic countries are not associated to CIS.

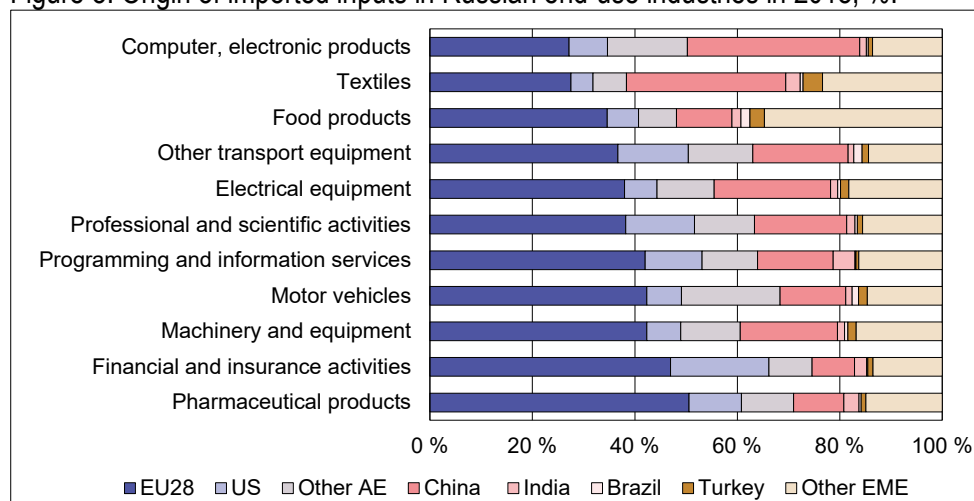
substantially. Thus, the combined share of the advanced economies remained practically unchanged at 61 % from 2013 to 2018 as did the corresponding share for the emerging economies at 39 %.

4.2 Origin of imports by Russian end-use industry

From the viewpoint of Russian end-use industries, the EU is the largest supplier of inputs in nearly all industries. The EU-28 import share was highest in 41 out of the 44 industries that the TiVA data covers varying between 36% and 51 % across industries (Figure 8). The share of EU imports was highest in Russia's pharmaceutical sector. The share of inputs originating in the US was highest in sectors like financial, publishing and mining support services as well as in manufacturing of other transport equipment and pharmaceuticals, varying between 10-20 % of imports. The advanced economies combined accounted for more than half of input imports in all other Russian sectors except for food and textile industries.

China was the largest input supplier in Russian textile industry and computer & electronics manufacturing accounting for a third of imported inputs. In Russian service sectors, the share of China was largest in telecommunications and professional services sectors with a share of about 20 % of imports. Among emerging markets, Turkey provided 4 % of imported inputs of the Russian textile industry and India 4 % of the inputs of Russian information services sector. The aggregate of other emerging economies accounted for the highest import share of 35 % in the Russian food manufacturing sector.

Figure 8. Origin of imported inputs in Russian end-use industries in 2018, %.



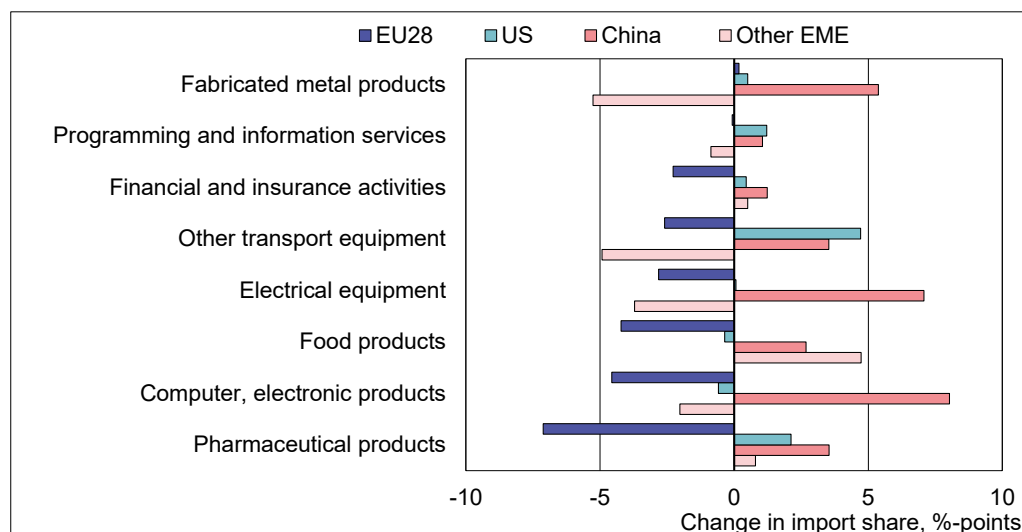
Source: OECD TiVA.

China's share in input imports has increased in most Russian industries. The US has also seen slight share gains in several branches (Figure 9). In contrast, the share of other emerging markets and the EU28 have declined in most branches. China's biggest share increases were seen in Russian computer & electronics and electrical equipment manufacturing, as well as in the metal industry. The share of US inputs has increased particularly in the Russian manufacturing of other transport equipment and pharmaceuticals.

EU inputs have lost significance, especially in Russian pharmaceuticals, computer & electronics manufacturing and the food industry. In the food industry, EU inputs have been replaced by other emerging markets, reflecting the import bans on imports of various foodstuffs Russia imposed in 2014. The share of other emerging markets in the imported inputs of Russia's fabricated

metal products and other transport equipment has declined substantially. This could reflect the declining role of Ukraine in Russian production chains after 2014.

Figure 9. Changes in input import shares in selected Russian end-use industries in 2013–2018, (p.p.)



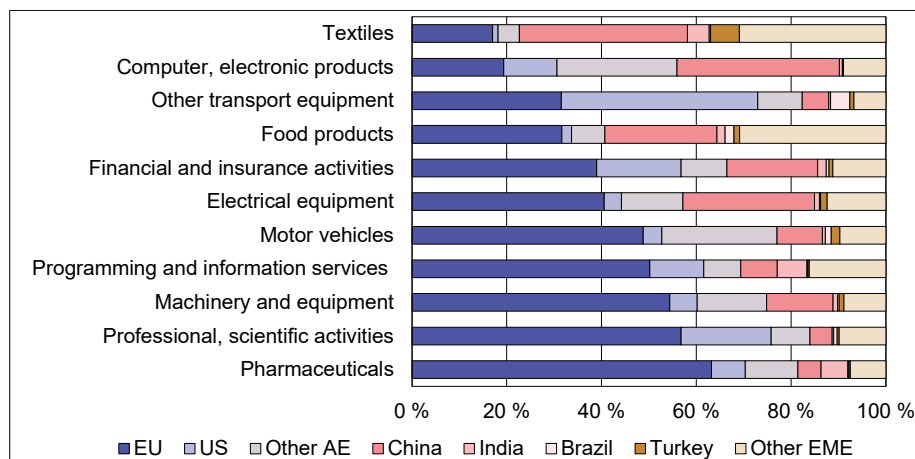
Note: Import distribution of inputs in Russian end-use industry from all industries in origin countries.
Source: OECD TiVA.

4.3 EU still dominates high-tech input imports, but China's share has risen

The EU dominates in most sectors of imported inputs (Figure 10), and particularly in high-tech inputs. The EU-28 accounted for 40–60 % of imported inputs in pharmaceuticals, machinery & equipment, motor vehicles and electrical equipment, as well as information and scientific services. The US was the largest provider of imported inputs of the other transport equipment industry. Advanced economies accounted for at least half of all high-tech and medium-high-tech imported inputs.

In high-tech inputs, China accounted for 34 % of the imported inputs provided by the computer & electronics industry and 28 % of the imported inputs provided by the electrical equipment industry. India accounted for 6 % of the imported inputs from the pharmaceutical manufacturing and information services. Brazil provided 4 % of the imported inputs from the other transport equipment manufacturing (Brazil has a large aircraft industry). Emerging markets were mainly important as input sources for low-tech industries such as textiles and food manufacturing. Inputs from emerging markets overall accounted for the majority of imported inputs.

Figure 10. Origin of Russian imported inputs by input sector in 2018.

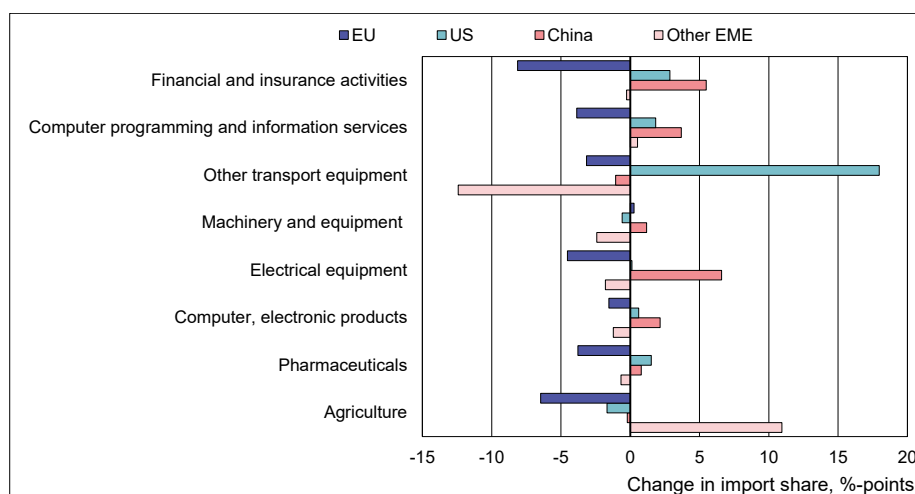


Source: OECD TiVA.

A closer look at changes in the input imports at the industry level reveals that the EU share decreased for most types of inputs during 2013–2018 (Figure 11). The declines after 2014 are particularly pronounced for inputs from industries subject to EU restrictions (e.g. financial services) or Russian import bans (agricultural products). In input imports for these industries, the EU-28 share has declined by 7–8 percentage points. In financial services, it has been replaced by China and the US. In agricultural products, we see increased share from other emerging markets (including Belarus).

The EU’s share in Russian imports of inputs from several high-tech sectors has also decreased. This applies to electrical equipment, computers & electronics, pharmaceuticals and information services. China’s share for technology sectors has grown visibly. The share of the US has also increased slightly, which could reflect the US value added embodied in Chinese exports to Russia instead of direct exports. The EU has kept its share in the inputs from the machinery & equipment industry. Another notable change can be seen in the inputs from the other transport equipment manufacturing. The share of the US has increased substantially, while the share of other emerging economies has declined.

Figure 11. Changes in import shares in selected input industries of origin in 2013–2018, (p.p.)



Note. Import distribution of inputs provided by a particular industry for all Russian end-use production industries.

Source: OECD TiVA.

4.4 Assessing China's potential for replacing Western imports

To get a better idea of China's potential as a replacement source for Russian imports, we focus on Russia's top-30 import items from the EU and the US. We use data at the most disaggregate level available in the UN's Comtrade database, the HS6 classification and check the evolution of China's share in Russian imports between 2012-2013 and 2019-2020¹⁵. We consider a high and rising import share as an indication of higher substitution potential. A low and stable or declining import share is interpreted as an indication of lower substitution potential.

For about half of products, China's share was relatively large in 2019–2020, and much higher than the average for 2012–2013 (Table 2). Products with “high replacement potential” include electronic and electrical equipment. For the other half, China's share has remained small and stagnant throughout the period or declined. This “low replacement potential” category includes medicaments, vehicles, vehicle parts and turbo-jets.

Table 2. Evolution of China's share in Russian imports for top-30 items from the EU and the US in 2012–2020.

High potential for import replacement				Low potential for import replacement			
HS6 code		China's import share in 2019-2020, %	Change in share, p.p.	HS6 code		China's import share in 2019-2020, %	Change in share, p.p.
850440	Electrical static converters	51.1	23.1	842240	Machinery; for packing or wrapping	7.3	4.8
842139	Machinery; for filtering or purifying gases	32.1	19.9	841989	Machinery, plant and lab equipment	8.1	4.4
847150	Units of automatic data processing machines	37.5	18.6	870829	Vehicles; parts and accessories of bodies	11.8	2.4
851762	Communication apparatus	64.1	13.6	901890	Medical instruments and appliances	14.3	2.0
848180	Taps, cocks, valves and similar appliances	32.9	13.4	870840	Vehicle parts; gear boxes	6.2	0.8
840734	Engines; reciprocating piston engines	30.6	13.3	870850	Vehicle parts; drive-axles	14.4	0.7
841480	Pumps and compressors; for air	20.6	12.9	300490	Medicaments	0.2	0.1
854231	Electronic integrated circuits	20.6	12.5	841112	Turbo-jets	0.0	0.0
841370	Pumps; centrifugal	25.9	10.9	870120	Tractors; road, for semi-trailers	0.6	-0.6
843680	Machinery; for agricultural or forestry	11.0	10.7	870899	Vehicle parts and accessories	3.8	-0.7
853710	Boards, panels, consoles, desks	18.0	9.3	870830	Vehicle parts; brakes	13.9	-2.6
880240	Aeroplanes and other aircraft	8.9	8.9	840820	Engines; compression-ignition piston engines	15.5	-3.7
847989	Machines and mechanical appliances	16.6	8.1	847330	Machinery; parts and accessories	60.1	-9.9
870333	Vehicles; compression-ignition piston engine	7.9	7.9	847170	Units of automatic data processing machines; storage	33.1	-18.8
870323	Vehicles; spark-ignition piston engine	6.8	5.9				
870332	Vehicles; compression-ignition piston engine	5.7	5.6				

Source: UN Comtrade.

¹⁵ We use two-year averages to mitigate the potential problem of large annual variation at this level of disaggregation.

The above analysis is obviously highly indicative and subject to various caveats. The level of disaggregation is not high enough to make any definitive conclusions. Nevertheless, for such products as certain semi-conductors, China is still unable to produce sophisticated components that match the quality or performance of those provided by the cutting-edge producers complying with Western sanctions. Chinese substitutes may be of inferior quality for other inputs as well. Moreover, the analysis suggests that for some products such as medicines, China is simply not a major supplier. This restricts the replacement potential over in the near term and possibly well into the future.

There is a separate question of whether China is willing to provide substitutes for Russia. While China has yet to publicly condemn Russia's military aggression and has vowed continuing friendly relations, it already seeks to avoid open violations of the Western sanctions imposed on Russia in 2014. China has provided only limited economic support to Russia – and only on terms very beneficial to itself. This seems to be the tightrope China is also currently walking. For example, media reports claim China has refused to provide Russia with spare parts for aircraft. Western countries are economically very important to China and Chinese companies are willing to avoid risks of falling under Western sanctions themselves (Kaaresvirta, 2022; Korhonen & Simola, 2022).

5. Concluding remarks

On the aggregate level, Russian production is not heavily dependent on imported inputs. Moreover, the country's import dependency has remained relatively stable. Nevertheless, import dependency is high and has even increased in recent years in several key sectors, particularly high-technology. This has happened despite Russia's 2014 declaration of an import substitution policy and a substantial depreciation of the ruble.

Russia's import substitution options appear limited. Results in the agricultural sector, where import substitution has been strongly supported by the state, have been mixed at best. Overall, the policy has mostly led to higher prices and reduced consumer welfare in the domestic market. Developing import-substituting production for higher technology sectors is far more challenging. The disparity between the product structure of Russian exports and imports also provides little hope for import substitution. Company surveys suggest that import substitution is hampered by the absence or poor quality of domestic analogues.

Obviously, some import substitution will take place in Russia in the coming years if the Western export bans remain in place, but it is likely that the domestic substitutes will be of inferior quality, limited availability or more expensive. While the Soviet experience provides rich guidance for managing with less-than-cutting-edge technologies, the possibilities for high-tech domestic production are limited.

Another option for Russia is to look for substitutes from other import markets, particularly China. China's share in Russian imports has increased substantially in recent decades. Although potentially of lower quality, China can provide substitutes for Western imports for many products. China cannot, however, replace all Western imports in the immediate future. Moreover, it remains open to what extent China is willing to support Russia's current cravings for territorial expansion.

China already provides 25 % of Russian imports, making Russia, along with Cambodia and the Kyrgyz Republic, one of the most dependent countries on Chinese imports. Rising imports also will make Russia increasingly dependent on China – and that dependency looks to be very one-sided.

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