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Russia's technology imports from East Asia



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Contents

Abstract	3
1. Introduction	4
2. Overview of Russia's imports from East Asia	4
3. Detailed examination of imports	6
3.1 China	6
3.2 Japan	8
3.3 South Korea	9
3.4 ASEAN	11
3.4 Taiwan	12
4. Concluding remarks	13
References	15

Aino Röyskö and Heli Simola

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Abstract

This brief considers the role of East Asian economies in Russia's technology imports. The EU, US and UK have set strict sanctions and export restrictions on Russia in response to the war in Ukraine, while responses from East Asian economies have been mixed. By restricting exports of technology production equipment and inputs, Japan, Korea, Taiwan and Singapore have substantially hindered the availability of certain technology products in Russia. China and most other emerging economies in East Asia have not imposed sanctions on Russia and thus could potentially provide substitutes for Russia for some technology imports restricted by sanctions. There is little evidence so far, however, of any such shift occurring.

Keywords: Russia, trade, East Asia, sanctions, technology imports

1. Introduction

Russia's illegal annexation of Crimea in 2014 and subsequent invasion in Ukraine in February 2022 have led to substantial restrictions on exports to Russia. Many of the restrictions, imposed by the EU, US and UK and their allies, relate to technology exports. Exports to Russia are also limited by sanctions concerning Russia's financial and transport sectors. In addition, over a thousand international companies have ceased business operations in Russia (Simola, 2022b,c).¹

Some East Asian economies – Japan, Korea, Taiwan and Singapore – participate to some extent in the Western sanctions regime. In particular, these countries have restricted specific technology exports to Russia. In contrast, China and ASEAN member countries, with the exception of Singapore, have not imposed economic sanctions on Russia.²

In this brief, we examine Russian technology imports from East Asian countries.³ We focus on technology goods as these are subject to restrictions by most developed countries. The technology sector is also one where Russia imports a substantial amount of both inputs and final goods. We review the importance of East Asian economies as providers of technology imports for Russia as well as the structure of these imports by economies.

We find that East Asian economies are important suppliers of technology goods for Russia in various product categories. China is an important source of consumer electronics, Japan a leading supplier of passenger cars and car parts, Korea for shipping industry products, Taiwan in products using semiconductors and ASEAN countries for electrical equipment.

The brief is structured as follows. Section 2 presents a general overview of Russian technology imports from East Asia. Section 3 examines the import structures down to product category for each economy. Section 4 concludes.

2. Overview of imports from East Asia

At the aggregate level, Russia does not appear to be particularly reliant on foreign inputs in its domestic production. The share of imported inputs of all intermediate inputs used was just 12 % in 2018. However, high-technology sectors prove the exception, with 35 % of foreign intermediate inputs used in computer and electronics industries, approximately 27 % in production of motor vehicles and other transport equipment and 26 % in machinery and equipment (Simola, 2022a).

Russia also imports a variety of final goods in these product categories. This makes the sectors more exposed to effects of economic sanctions and export bans. In addition, Russia has limited opportunity to replace the needed imports by the products it would normally export as the product structure of its imports and exports is highly mismatched. Thus, Russian production is quite vulnerable to disruptions in import supply (Gnidchenko et al., 2016; Simola, 2022a,b).

Overall, the EU has been Russia's biggest source of imports (Korhonen & Simola, 2022). However, in the past years, the share of East Asia increased substantially in imports led by China. The share of East Asian economies in Russia's total goods imports was 34 % in 2019 with China

¹ See e.g. the list compiled by the Yale University experts at <https://som.yale.edu/story/2022/over-1000-companies-have-curtailed-operations-russia-some-remain>.

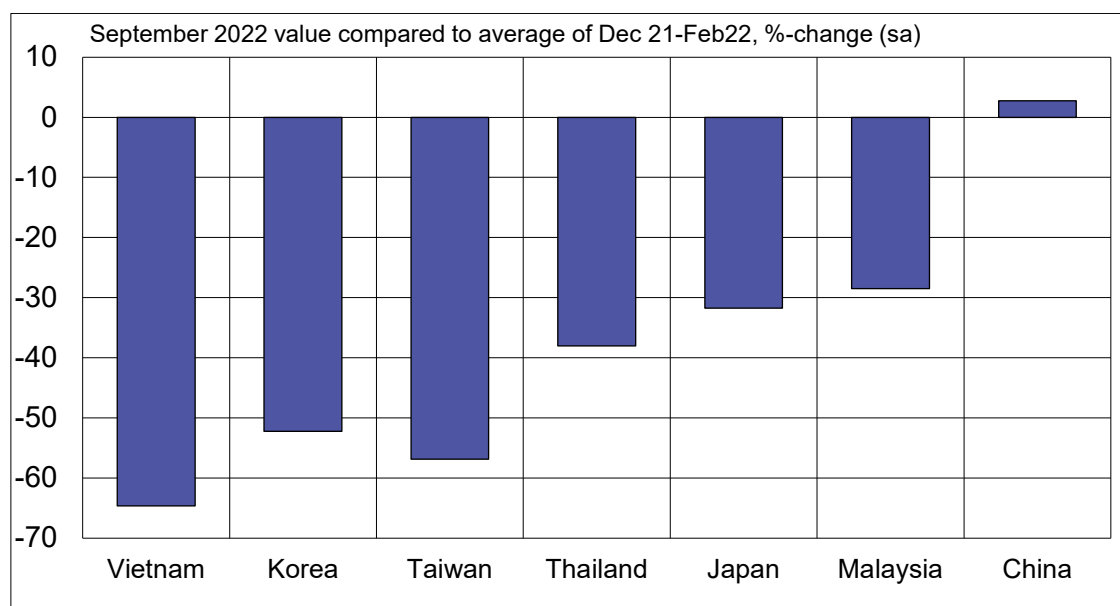
² The Association of Southeast Asian Nations (ASEAN) comprises ten members: Brunei, Cambodia, Indonesia, Myanmar, Lao, Malaysia, Philippines, Singapore, Thailand and Vietnam. Singapore's sanctions against Russia mainly apply to the financial and technology sectors.

³ For brevity, "East Asia" refers here to China, Hong Kong, Taiwan, Japan, South Korea and the ten ASEAN member countries.

accounting for the vast majority of Russia's imports from East Asia. Other largest import partners are Japan, South Korea and Vietnam.

After Russia's invasion of Ukraine at end-February 2022, Russian imports collapsed for nearly all of its trading partners (Simola, 2022c). Despite some recovery, the level of imports is still notably smaller than before the war. A similar development was seen for East Asian economies – irrespective of whether they had imposed sanctions on Russia. In September, the value of exports from most East Asian economies to Russia was down by 30–70 % (seasonally adjusted) compared to the pre-invasion level (Figure 1). The only exception was China. After an initial sharp fall, Chinese exports to Russia recovered to their pre-invasion level by September.⁴

Figure 1. Decline in the value of goods exports to Russia in September 2022 compared to pre-war level, % (seasonally adjusted).



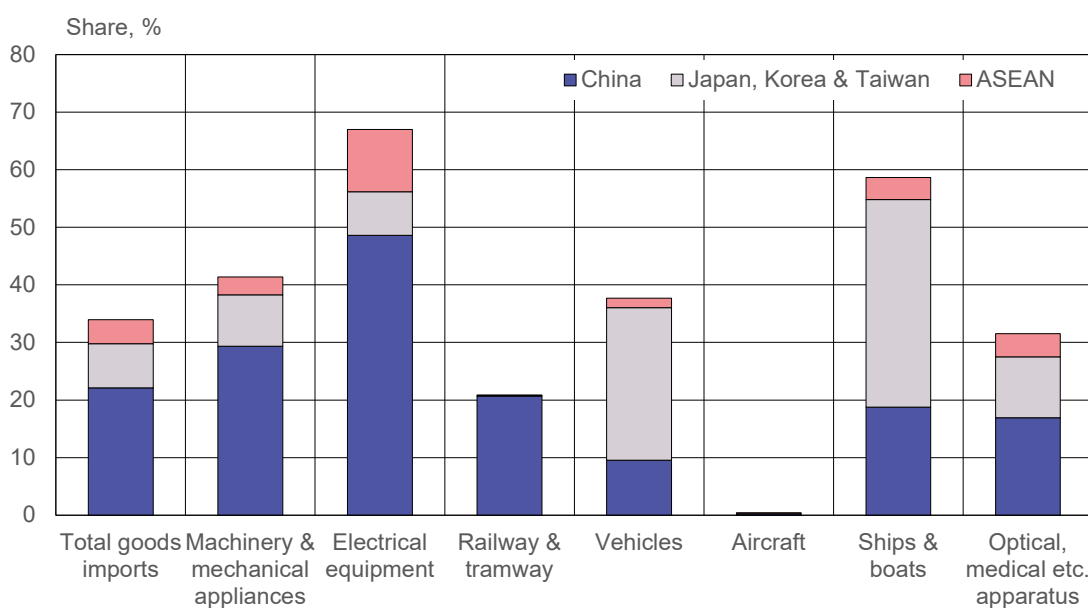
Sources: Macrobond, BOFIT.

Technology products such as machinery, equipment and related parts form a substantial part of the goods Russia imports from East Asia. In Russia's case, East Asian countries are also important suppliers of technology products. They accounted for about 40 % of Russian imports of machinery and vehicles, nearly 60 % of ships and boats, and a whopping 67 % of imported electrical equipment (Figure 2).

China is by far the largest import partner for Russia in most technology product categories reflecting its huge size and role as a global manufacturing hub. South Korea is the largest import provider of ships and boats, while Japan leads in imports of vehicles and related parts. Among ASEAN countries there is variation across product groups. Vietnam is a substantial import source of electrical equipment (e.g. equipment related to mobile phones), Malaysia for certain medical appliances, Thailand for vehicles and machinery and Indonesia for ships and boats.

⁴ Russia ceased to publish customs statistics after the February invasion of Ukraine, so we use the export figures reported by East Asian economies.

Figure 2. The share of East Asian economies in Russia's total imports and certain product categories in 2019, %.



Source: UN Comtrade.

3. Detailed examination of technology imports

In this section, we take a closer look at Russian technology imports from East Asian economies at the product level using the Harmonized System (HS) classifying method for traded goods. We focus on products with an import value over USD 10 million in 2019 (USD 100 million for China which has import values much higher than those of our other compared economies). For each economy, we first examine the average shares of the economies in Russian technology imports using the HS two-digit product level. We then drill down to the HS six-digit product level to review the top 20 products with highest import shares.

Each of the economies studied have specific technology products with high shares of Russia's total imports. The analysis also highlights the diversity of products exported from East Asia. China is an especially important source of consumer electronics, Japan for vehicles and vehicle parts, South Korea for tanker ships and vehicle parts, Taiwan for products using semiconductors and ASEAN economies for small electrical machines and apparatus as well as integrated electronic circuits.

3.1 China

China is Russia's most important import provider, accounting for 24 % of Russia's total imports in 2021. Its importance is only expected to grow in the future (Korhonen & Simola, 2022). Also in technology products, China is the most significant source of imports in most product categories. The categories with the highest overall value of imports (machinery, mechanical appliances and electrical equipment) are dominated by imports from China (Table 1). For vehicles and ships, China has a lesser importance to Russia than Japan or South Korea.

Table 1. Russian technology imports from China in 2019.

Product category (HS 2 code)	Number of products with over USD 100 million in imports	Average share of Russia's imports*
Machinery & mechanical appliances (84)	25	49 %
Electrical equipment (85)	24	62 %
Railway & tramway (86)	1	86 %
Vehicles (87)	9	20 %
Ships & boats (89)	1	33 %
Optical apparatus etc. (90)	1	14 %

*Average calculated across the HS subheading (6-digit) levels.

Source: UN Comtrade.

China is Russia's most important trading partner for electrical equipment and machinery. As seen in Table 2 below, almost all of Russia's imports are sourced from China in categories such as telephones, LED lamps, computers, monitors and household electronics. In terms of value, laptops, computers and telephones each accounted for over USD 1 billion in 2019. A significant amount of the products with a high ratio of imports are consumer goods, which differentiates China from the other East Asian economies, some of which tend to exhibit a higher ratio in capital goods.

Table 2. Products from China with largest import share of Russia's imports in 2019.

Product	Imports, USD million	Share of Russia's total imports
Machinery & mechanical appliances (84)		
847130 - Laptops and other portable automatic data-processing machines (weight less than 10 kg)	1890.9	95 %
841510 - Air conditioning machines (window, wall, self-contained or split system)	344.3	92 %
847141 - Computers, automatic data processing machines (containing CPU and input/output unit)	218.1	85 %
846721 - Electric hand drills	201	82 %
847160 - Keyboards, other input and output units for computers	173	75 %
847180 - Other units of computers and automatic data-processing machines	175.6	72 %
846729 - Hand tools with electric motor (excl. drills and saws)	149.9	68 %
847290 - Office machines and machines for sorting, counting or wrapping coins (not elsewhere classified)	195.1	67 %
Electrical equipment (85)		
853950 - Light emitting diode (LED) lamps	242.2	98 %
851679 - Fryers and other electrothermic domestic appliances	244.2	91 %
852852 - Monitors directly connected to computer systems	153.2	89 %
851830 - Headphones and earphones	377.7	87 %
853400 - Electronic printed circuits	104.5	83 %
852871 - Reception apparatus for television (not designed to incorporate a screen)	105.7	80 %
851712 - Telephones for cellular networks or for other wireless networks	4287.3	73 %
854140 - Photosensitive/photovoltaic/LED semiconductor devices	256.6	73 %
850940 - Food grinders and mixers, juice extractors	167.5	71 %
852859 - Monitors (excl. with TV receiver, CRT and those designed for computer use)	402.6	69 %

852990 - Parts for use with radio transmission, radar, radio navigational aid, reception and television apparatus	770.7	66 %
Railway & tramway (86)		
860900 - Cargo containers designed for carriage	109.6	86 %

Source: UN Comtrade.

3.2 Japan

Russian technology imports from Japan are dominated by machinery and mechanical appliances when measured by the number of individual products (Table 3). The average share of Japan in HS 6-digit product level varies from 11% for electrical equipment to 29% in the category of ships & boats, but there is considerable variation within product categories.

Table 3. Russian technology imports from Japan in 2019.

Product category (HS2 code)	Number of products with over USD 10 million in imports	Average share of Russia's imports*
Machinery & mechanical appliances (84)	36	15 %
Electrical equipment (85)	11	11 %
Vehicles (87)	22	18 %
Ships & boats (89)	3	29 %
Optical apparatus etc. (90)	11	17 %

*Average calculated across the HS subheading (6-digit) levels.

Source: UN Comtrade.

Russia's imports from Japan are very concentrated in certain product categories with 45% of total imports from Japan consisting of vehicles and vehicle parts. The share of Japan compared to other import sources is also significant. In 2019 Japan was the source of 26% of Russia's total imports of motor vehicles for passenger transportation and accounted for over 20% of imports of certain vehicle parts, namely vehicle bodies and motors (Table 4). Major Japanese car manufacturers, including Toyota and Honda, had production plants in Russia. Most of their operations have been suspended since the war broke out.

Additionally, Japan is an important import source for Russia in machinery and mechanical appliances, mainly bulldozers and angledozers, cranes, printing machinery, as well as motors and engines for marine vessels and cars (Table 4). While smaller in import values, Japan also accounts for most of Russia's imports of refrigerated vessels and camera lenses.

Table 4. Products from Japan with largest import share of Russia's imports in 2019.

Product	Imports, USD million	Share of Russia's total imports
Machinery & mechanical appliances (84)		
842919 – Bulldozers and angledozers (wheeled)	14.8	78 %
840721 – Outboard motors for marine propulsion (spark ignition)	65.2	75 %
842911 – Bulldozers and angledozers (crawler type)	161.3	49 %
842641 – Cranes and lifting frames (self-propelled, on tyres)	28.8	43 %
842952 – Mechanical shovels, excavators and shovel loaders (with revolving superstructure)	208	31 %

844399 – Parts and accessories of printers, copying machines and facsimile machines (not elsewhere specified)	104.1	28 %
840734 – Vehicle engines (spark ignition reciprocating, over 1000 cc)	266.3	21 %
Electrical equipment (85)		
851110 – Internal combustion engine spark plugs	49.8	47 %
Vehicles (87)		
870324 – Passenger vehicles (spark ignition engine of greater than 3000 cc)	537.9	42 %
870333 – Passenger vehicles (diesel engine of greater than 2500 cc)	564.4	31 %
870323 – Passenger vehicles (spark ignition engine of 1500-3000 cc)	854.3	27 %
870422 – Vehicles for goods transport (diesel engine, gross weight 5-20 tonnes)	28.9	23 %
871150 – Motorcycles (spark ignition engine of greater than 800 cc)	14.5	23 %
870410 – Dump trucks designed for off highway use	93.3	22 %
870710 – Bodies for passenger vehicles	455.2	22 %
870899 – Vehicle parts and accessories (not elsewhere specified)	239.1	21 %
Ships & boats (89)		
890130 – Refrigerated vessels (other than tankers)	40.9	68 %
Optical apparatus etc. (90)		
900211 – Objective lenses for cameras, projectors, etc	18	49 %
902212 – Computed Tomography (CT) Apparatus	30.5	27 %
902750 – Instruments using optical radiations (not elsewhere specified)	24.6	18 %

Source: UN Comtrade.

3.3 South Korea

Russian technology imports from South Korea are focused on machinery & mechanical equipment and electrical equipment when measured by the number of products (Table 5). The average share of South Korea in Russian imports is in the range of 10–20 % in most product categories, but is much higher in the ships & boats category (44 %). In this category there are, however, only two individual products with the import value exceeding USD 10 million.

Table 5. Russian technology imports from South Korea in 2019.

Product category (HS2 code)	Number of products with over USD 10 million in imports	Average share of Russia's imports*
Machinery & mechanical appliances (84)	26	13 %
Electrical equipment (85)	24	12 %
Vehicles (87)	17	16 %
Ships & boats (89)	2	44 %
Optical apparatus etc. (90)	8	19 %

*Average calculated across the HS subheading (6-digit) levels.

Source: UN Comtrade.

Like Japan, a high share of technology imports from South Korea are concentrated in the categories of machinery and mechanical appliances and vehicle parts. South Korea is an especially large import source of tanker ships, including LNG carriers and oil tankers. Import figures in these subcategories

can vary wildly from year to year given the scale of orders. In 2019, 81 % of the value of Russia's tanker ship imports came from South Korea. In 2020, tanker ship imports were valued at USD 714 million and accounted for 89 % of Russia's total imports from South Korea. In contrast Russia had no tanker imports from South Korea in 2018. The future of tanker imports remains unclear. Several South Korean shipbuilders have booked Russian orders, but marine equipment is included in South Korea's list of strategic items subject to export restrictions to Russia.

While South Korea accounts for a smaller share of Russia's passenger vehicle imports than Japan, it is an important import source of vehicle parts (Table 6). South Korea provides almost half of Russia's imports of bodies for passenger vehicles and a significant share of seat belts, bumpers, steering wheels, gearboxes, suspension systems and other vehicle parts. South Korea's Hyundai Group also has a vehicle production facility in St. Petersburg, but its operations have been suspended since the war broke out.

Table 6. Products from South Korea with largest import share of Russia's imports in 2019.

Product	Imports, USD million	Share of Russia's total imports
Machinery & mechanical appliances (84)		
848630 - Machines and apparatus for the manufacture of flat panel displays	16.7	93 %
842691 - Cranes (designed for mounting on road vehicles)	35.2	41 %
842952 - Mechanical shovels, excavators and shovel loaders (with revolving superstructure)	178.7	26 %
Electrical equipment (85)		
851230 - Sound signaling equipment for motor vehicles	13.3	34 %
851521 - Electric resistance welding equipment (automatic)	15.8	25 %
854232 - Memories (electronic integrated circuits)	18.8	25 %
851220 - Electrical lighting or visual signaling equipment for motor vehicles	115.6	24 %
850710 - Lead-acid batteries for vehicles	56.8	21 %
852721 - Radio-broadcast receivers for motor vehicles (with sound recording apparatus)	25.7	19 %
Vehicles (87)		
870710 - Bodies for passenger vehicles	870	42 %
870821 - Safety seat belts for motor vehicles	17.2	32 %
870810 - Bumpers and parts of bumpers for motor vehicles	51.7	23 %
870894 - Steering wheels, columns and boxes for motor vehicles	110.6	22 %
870840 - Gear boxes and parts of gear boxes	285.6	20 %
870829 - Other parts and accessories of bodies for motor vehicles	322.4	19 %
870880 - Suspension systems and shock absorbers for motor vehicles	171.7	19 %
Ships & boats (89)		
890120 - Tanker ships for transport or storage of liquids and gases	542.5	81 %
Optical apparatus etc. (90)		
902213 - Apparatus based on the use of X rays for dental uses	12.9	42 %
902129 - Dental fittings (other than artificial teeth)	36.5	36 %
901812 - Ultrasonic scanning apparatus (medical use)	50.6	23 %

Source: UN Comtrade.

3.4 ASEAN countries

Russian technology imports from the ASEAN countries are dominated by electric equipment when measured by the number of products (Table 7). The average share of ASEAN countries combined varies from 8 % in the category of vehicles to 26 % in the category optical apparatus. The variation within product categories is rather large in the case of ASEAN countries.

Table 7. Russian technology imports from ASEAN countries in 2019.

Product category (HS2 code)	Number of products with over USD 10 million in imports	Average share of Russia's imports
Machinery & mechanical appliances (84)	27	13 %
Electrical equipment (85)	34	19 %
Vehicles (87)	8	8 %
Ships & boats (89)	2	14 %
Optical apparatus etc. (90)	6	26 %

*Average calculated across the HS subheading (6-digit) levels.
Source: UN Comtrade.

The composition of Russia's imports from ASEAN countries in technology products differs from that of Japan or South Korea. Electronic integrated circuits and a wide variety of small electrical machines and apparatus from ASEAN countries with high value account for a substantial share of Russia's imports in certain subcategories (Table 8). Unlike Japan or South Korea, ASEAN countries are not a major source of vessel, vehicle or vehicle part imports.

Specialization of different ASEAN countries can also be seen in the import structure as imports in most significant subheadings are mostly sourced from 1-3 different ASEAN countries. Vietnam is especially important in imports of small electrical machines, i.e. printing and copying machines and vacuum cleaners, while most electronic integrated circuits are sourced from Malaysia. Thailand is a key source of diesel-powered trucks for goods transport.

While not shown in Table 8, the product with the highest yearly import value is telephones. Russia imported over USD 1 billion worth of phones from Vietnam in 2019, accounting for 18 % of Russia's total imports in telephones. Most of the remaining phone imports came from China.

Table 8. Products from ASEAN countries with largest import share of Russia's imports in 2019.

Product	Imports, USD million	Share of Russia's total imports	ASEAN country with highest value of imports
Machinery & mechanical appliances (84)			
854231 – Processors and controllers (electronic integrated circuits)	388.5	60 %	Malaysia
845210 – Sewing machines (household use)	22.9	57 %	Vietnam
844331 – Multifunction printers or fax machines	173.2	54 %	Vietnam
847050 – Cash registers	33.5	31 %	Vietnam
847170 – Storage units for computers	315	30 %	Thailand
844332 – Other printers	65.6	29 %	Vietnam
Electrical equipment (85)			
852691 – Radio navigational aid apparatus	140	55 %	Singapore

850819 – Vacuum cleaners (with self-contained electric motor)	92.5	42 %	Vietnam
852872 – Reception apparatus for television (incorporating a colour screen)	107.4	35 %	Malaysia
854233 – Amplifiers (electronic integrated circuits)	13.7	33 %	Malaysia
850720 – Lead-acid batteries (not for vehicle use)	50.1	23 %	Vietnam
854239 – Electronic integrated circuits (other than memories, amplifiers, processors or controllers)	91.4	23 %	Malaysia
854370 – Other electrical machines and apparatus	113.9	23 %	Malaysia
850811 – Vacuum cleaners (with self-contained electric motor of power not exceeding 1500 W)	49.6	22 %	Malaysia
852791 – Radio-broadcast receivers with sound recording apparatus	11.2	22 %	Malaysia
852862 – Projectors connected to computers	14.9	21 %	Philippines
Vehicles (87)			
870421 – Vehicles for goods transport (diesel engine, gross weight less than 5 tonnes)	123.9	44 %	Thailand
Optical apparatus etc. (90)			
903084 – Other instruments and apparatus designed for telecommunications (with a recording device)	12.9	64 %	Malaysia
902150 – Pacemakers for stimulating heart muscles	11.8	45 %	Singapore
900150 – Spectacle lenses of other materials	16.7	27 %	Thailand

Source: UN Comtrade.

3.5 Taiwan

As the smallest of the economies compared, Taiwan has fewer product categories that stand out in terms of import value or share of imports. The categories with significant import products are highly concentrated in the machinery & mechanical appliance and electrical equipment categories (Table 9).

Table 9. Russian technology imports from Taiwan in 2019.

Product category (HS2 code)	Number of products with over USD 10 million in imports	Average share of Russia's imports
Machinery & mechanical appliances (84)	10	15 %
Electrical equipment (85)	13	11 %
Vehicles (87)	1	1 %

*Average calculated across the HS subheading (6-digit) levels.

Source: UN Comtrade.

Taiwan's specialization in semiconductor technology and chip manufacturing can also be seen in Russia's imports. The products with highest import values are computer parts and devices utilizing semiconductor technology, including solid-state storage devices and different types of electronic integrated circuits (Table 10). Most of these products fall under the export bans put in place in spring 2022 by Taiwan's Ministry of Economic Affairs. In the ranking, some products from other categories also show up, although with smaller values and shares. These include tools and machines for metalwork, certain motor vehicle parts and lathes.

Table 10. Products from Taiwan with largest import share of all Russia's imports in the subheading.

Product	Imports, USD million	Share of Russia's total imports
Machinery & mechanical appliances (84)		
845210 - Sewing machines (household use)	10.5	26 %
845710 - Machining centres for metal work	56.7	24 %
845891 - Lathes (for removing metal, numerically controlled, other than horizontal lathes)	14	22 %
847330 - Parts and accessories of computers and data processing equipment	183.9	22 %
846693 - Parts and accessories of machine tools and for working metals	14.8	20 %
845811 - Lathes (for removing metal, horizontal, numerically controlled)	26.9	14 %
847180 - Other units of computers and automatic data-processing machines	30.7	13 %
847170 - Storage units for computers	86.6	8 %
847150 - Processing units for computers	65	4 %
Electrical equipment (85)		
852351 - Solid-state, non-volatile storage devices (flash memory, USB sticks, memory cards)	82.5	32 %
854239 - Electronic integrated circuits (other than memories, amplifiers, processors or controllers)	122.9	31 %
851290 - Parts of electrical lighting or signaling equipment, windshield wipers, defrosters and demisters, used for cycles or motor vehicles.	25.6	22 %
854232 - Memories (electronic integrated circuits)	13.7	18 %
854231 - Processors and controllers (electronic integrated circuits)	50.4	8 %
854442 - Insulated electric conductors (for a voltage not exceeding 1000 volts, fitted with connectors)	22.2	7 %
851762 - Machines for the reception, conversion and transmission or regeneration of voice, images or other data (excluding telephone sets or base stations)	84	5 %
852580 - Television cameras, digital cameras and video camera recorders	19.8	4 %
851220 - Electrical lighting or visual signaling equipment for motor vehicles	20.7	4 %
850440 - Electrical static converters	34	4 %
852859 - Monitors (excl. with TV receiver, CRT and those designed for computer use)	17.7	3 %

Source: UN Comtrade.

4. Concluding remarks

This brief analyzed the role of East Asian economies in Russian technology import. Along with the EU, US and UK, certain East Asian economies have imposed restrictions on technology exports to Russia in response to Russia's war in Ukraine. Our analysis shows that Russia is heavily reliant on imports of technology products from East Asian economies in a variety of product categories for both consumer and capital goods.

The current restrictions are likely to complicate Russian domestic production in many sectors, particularly those involving certain semiconductors for which the market is overwhelmingly dominated by Korean and Taiwanese manufacturers. Other important technology product categories

include vehicles and their parts and tanker ships, for which Japan and Korea are important suppliers for Russia.

On the other hand, China and most ASEAN countries have not imposed export restrictions on Russia. China could potentially provide substitutes for some of the technology imports for Russia that are restricted from Western countries. Many ASEAN countries are also important suppliers of various technology products and some restricted technology imports could potentially be replaced from these countries. Such actions, however, come with a risk of violating the sanctions regime imposed by the developed economies.

Indeed, some East Asian companies, including certain Chinese and Vietnamese producers, have reportedly ceased their operations with Russia at their own initiative without any official sanctions imposed. Our analysis also illustrates that Russia's production possibilities could be hampered further if all East Asian countries join in supporting the export restrictions imposed on Russia.

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