

Column A The Economic Impact of Russia's Invasion of Ukraine on Japan and Kansai from a Trade Perspective

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1. Introduction

The economic impact of Russia's invasion of Ukraine is spreading around the world through various channels, including commodity markets, trade, and financial markets. This column analyzes the impact of Russia's invasion of Ukraine from a trade perspective.

Figure 2-CA-1 is a simple representation of the direct and indirect impacts of the conflict. It shows the economic size of major economies and the share of Russian exports and imports in their total international trade.

In the following paragraphs, we outline the state of trade between major countries/regions and Russia in 2021 by trade good categories. We then calculate the degree of dependence on Russia for major economies by trade good category, defined as Russia's share in each good's total exports and imports.

We define the trade share of country i and that of individual goods as follows:

$$\text{Trade share of country } i \text{ with country } j = \frac{X_{ij}}{\sum_i X_{ij}} \quad (1)$$

$$\text{Therein, the trade share of good } k = \frac{X_{ij}^k}{\sum_i X_{ij}^k} \quad (2)$$

(Note: i is the home country, j is the trading partner, X_{ij} is the trade value between country i and country j , and X_{ij}^k is the trade value between country i and country j for good k).

By comparing the trade share of the home country with respect to Russia (1) and the trade share of Russia for individual trade goods (2), we assess the amount of risk associated with each good for major economies. Even if Russia has a low share in a country's total trade as a whole, Russia's share might be very large for a specific trade good. For example, although Russia accounts for only 1.8% of Japan's total imports, with regard to lumber, Japan's dependence on Russia is up to 13.1%.

An analysis by trade good category is important, because if the supply of a particular good were to be disrupted due to a deterioration of the conflict, it might lead to supply problems in the importing country.

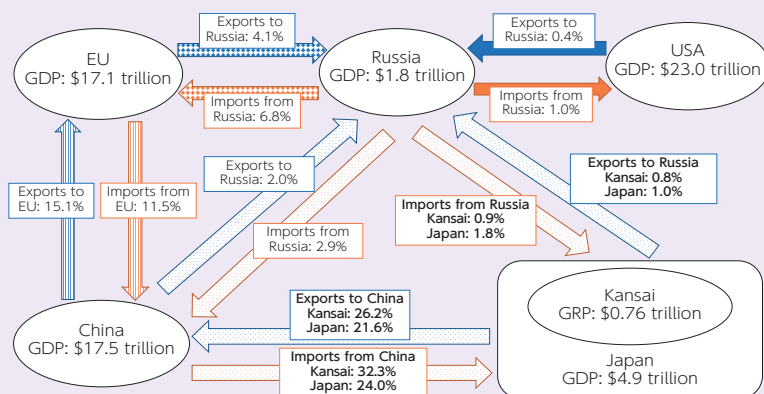


Figure 2-CA-1 Economic Scale and Trade Dependency of Russia and Countries/Regions

Source: Authors' calculations based on IMF DataMapper, UN Comtrade, and Ministry of Finance, Trade Statistics of Japan.

2. Major economies' trade with Russia and their trade dependence on Russia

Below, we outline the state of trade between Russia and the US, EU, and China by trade good category in 2021, and we focus on the goods whose exports and imports are heavily dependent on Russia.

(1) Trade between US and Russia

In 2021, the US exports to Russia totaled \$6.4 billion and imports totaled \$30.8 billion. The share of Russia-bound exports in total US exports is 0.4%, Russia's share in total US imports is about 1.0%. This suggests that the US is not highly dependent on trade with Russia.

Table 2-CA-1 shows the top 10 export/import good categories from/to the US, the dollar value of these exports/imports, the share of each good category in total exports/imports, and Russia's share in the exports/imports of each good category.

Among US exports to Russia, transportation machinery, including Automotive parts (6.7%), motor vehicles (4.7%), and aircraft (3.4%), account for a relatively high share. On the other hand, oil and oil products (42.9%) account for the majority of imports from Russia, followed

Table 2-CA-1 US trade with Russia and dependence on Russia

US exports to Russia				US imports from Russia			
Trade good category	Billion yen	Share of total exports to Russia (%)	Dependence on Russia (%)	Trade good category	Billion yen	Share of total imports to Russia (%)	Dependence on Russia (%)
Auto motive Parts	42.6	6.7	1.2	Petroleum and rel. products	1,321.1	42.9	20.6
Auto mobiles	30.1	4.7	0.5	Crude oil	484.3	15.7	3.5
Aircraft	21.6	3.4	6.1	Platinum	245.0	8.0	13.4
Blood for medical use	20.5	3.2	0.5	Pig iron, etc.	119.8	3.9	35.0
Tractors	14.0	2.2	2.7	Crustaceans	110.8	3.6	10.1
Medical equipment	12.3	1.9	0.4	Iron	92.7	3.0	21.9
Engines	12.1	1.9	1.6	Nitrogen fertilizers	79.3	2.6	20.2
Food preparations	10.0	1.6	1.4	Radioactive compounds	67.1	2.2	21.6
Data processing machinery	9.9	1.5	0.4	Aluminum	52.3	1.7	4.5
Tires	9.8	1.5	2.2	Ferro alloys	46.9	1.5	13.9
Total	638.8	100.0	0.4	Total	3,076.2	100.0	1.0

Source: Prepared by the author from UN Comtrade.

by crude oil (15.7%), platinum (8.0%), pig iron, etc. (3.9%), and shellfish (3.6%). Notably, energy-related products account for 60% of total imports from Russia.

Among the top 10 US exports to Russia, aircraft is the trade good category for which Russia has the largest share (6.1%) relative to its share in total US exports (0.4%).

On the other hand, relative to total US imports from Russia (1.0%), the US is much more dependent on Russia for pig iron, etc. (35.0%), iron (21.9%), radioactive compounds (21.6%), petroleum and its derivatives (20.6%), and nitrogen fertilizers (20.2%). However, despite the high

Table 2-CA-2 EU's trade with Russia and dependence on Russia

EU's exports to Russia				EU's imports from Russia			
Trade good category	Billion yen	Share of total exports to Russia (%)	Dependence on Russia (%)	Trade good category	Billion yen	Share of total imports to Russia (%)	Dependence on Russia (%)
Medical supplies	679.0	6.5	4.8	Crude oil	5,739.0	34.0	24.9
Automotive parts	381.3	3.7	6.2	Petroleum and rel. products	2,662.3	15.8	39.4
Auto mobiles	365.3	3.5	2.4	Petroleum gas	2,232.2	13.2	30.5
Aircraft	264.6	2.5	6.1	Coal and briquettes	611.4	3.6	45.2
Blood for medical use	218.6	2.1	1.9	Miscellaneous	465.6	2.8	6.3
Data processing machinery	150.8	1.4	6.5	Coal tar distillates	324.5	1.9	39.3
Medical equipment	143.1	1.4	4.3	Iron	310.3	1.8	50.8
Centrifuges	127.6	1.2	7.1	Copper	271.1	1.6	35.8
Machinery	126.3	1.2	5.7	Platinum	248.6	1.5	22.0
Cocks, valves	123.0	1.2	5.9	Diamonds	213.0	1.3	17.3
Total	10,446.5	100.0	4.1	Total	16,875.4	100.0	6.8

Source: Prepared by the author from UN Comtrade.

dependence on petroleum and related products, in the case of a conflict deterioration, the US is able to supply its own crude oil production, meaning that there are no economic security concerns.

Table 2-CA-3 China's trade with Russia and dependence on Russia

China's exports to Russia				China's imports from Russia			
Trade good category	Billion yen	Share of total exports to Russia (%)	Dependence on Russia (%)	Trade good category	Billion yen	Share of total imports to Russia (%)	Dependence on Russia (%)
Tele-phones	538.7	8.0	2.1	Crude oil	4,054.1	51.3	15.7
Data processing machines	330.2	4.9	1.6	Coal and briquettes	706.6	8.9	26.1
Auto mobiles	151.8	2.3	6.2	Copper	390.5	4.9	10.8
Auto-motive parts	142.3	2.1	3.1	Petro-leum gas	369.7	4.7	5.3
Clothing and accessories	137.6	2.1	54.8	Lumber	304.4	3.9	38.7
Toys	128.0	1.9	2.8	Iron ore	148.8	1.9	0.8
Foot-wear	108.6	1.6	4.8	Petro-leum and related products	132.2	1.7	7.9
House-hold electrical appliances	100.0	1.5	3.1	Copper ore	121.9	1.5	2.1
Lighting fixtures	94.2	1.4	1.9	Platinum	119.1	1.5	11.9
Gas pumps	91.8	1.4	3.8	Frozen fish	103.9	1.3	29.6
Total	6,694.6	100.0	2.0	Total	7,897.1	100.0	2.9

Source: Prepared by the author from UN Comtrade.

(2) Trade between EU and Russia

EU's exports to Russia and imports from Russia in 2021 totaled \$104.5 billion and \$168.8 billion, respectively, accounting for 4.1% and 6.8% of the EU's total exports and imports. EU's dependence on trade with Russia is relatively high compared to that of the US (Table 2-CA-2).

Among the EU's top 10 exports to Russia, pharmaceuticals, auto parts, and automobiles collectively account for about 14% of EU' total

exports to Russia. On the other hand, within EU imports from Russia, energy-related goods account for a very high 66.6%, including crude oil (34.0%), oil and oil products (15.8%), petroleum gas (13.2%), and coal and coal briquettes (3.6%).

Relative to Russia's share in EU's total exports to Russia (4.1%), among the EU's top 10 exports to Russia, the ones for which Russia has the largest share are centrifuges (7.1%), data processing machinery (6.5%), and automotive parts (6.2%). On the other hand, relative to EU's total imports from Russia (6.8%), the EU is much more dependent on Russia for imports of iron (50.8%), coal and coal briquettes (45.2%), petroleum and oil products (39.4%). In other words, the EU's dependence on Russia for raw materials and energy-related goods is very high. The escalation of the situation in Ukraine has led to a significant decrease in imports of these products, which is a major blow to the EU economy.

(3) Trade between China and Russia

China's exports to Russia in 2021 totaled \$66.9 billion, which is around 2.0% of China's total exports. Imports from Russia totaled \$79.0 billion, representing 2.9% of China's total imports. China's dependence on trade with Russia is low compared to the EU, but high compared to the US and Japan (Table 2-CA-3).

China's top exports to Russia are telephone equipment (8.0% of China's exports to Russia) and data processing machinery (4.9%). On the other hand, crude oil dominates imports (51.3%), followed by coal and briquettes (8.9%).

Relative to Russia's share in China's total exports (2.0%), among China's top 10 export categories to Russia, clothing and accessories (54.8%) is the category for which Russia has the largest share, followed by automobiles (6.2%) and footwear (4.8%). On the other hand, relative to China's total imports from Russia (2.9%), China is much more dependent on Russia for imports of lumber (38.7%), frozen fish (29.6%), coal and briquettes (26.1%), and crude oil (15.7%). In other words, as an import market, China is highly dependent on Russia for raw materials and energy.

Table 2-CA-4 Japan's trade with Russia and dependence on Russia

Japan's exports to Russia				Japan's imports from Russia			
Trade good category	Billion yen	Share of total exports to Russia (%)	Dependence on Russia (%)	Trade good category	Billion yen	Share of total imports to Russia (%)	Dependence on Russia (%)
Auto mobiles	357.5	41.5	3.3	Natural and manufactured gases	372.4	24.0	7.4
Auto-motive parts	100.1	11.6	2.8	Petroleum and related products	296.5	19.1	3.3
Construction and mining equipment	57.9	6.7	4.4	Non-ferrous metals	292.4	18.9	10.3
Rubber products	46.6	5.4	5.3	Coal, coke and briquettes	283.1	18.3	9.8
Engines and motors	46.1	5.3	1.8	Seafood and related products	137.4	8.9	9.1
Re-exported products	27.5	3.2	0.5	Lumber	53.4	3.4	13.1
Cargo handling machinery	20.8	2.4	3.5	Iron and steel	45.4	2.9	4.3
Pumps and centrifuges	16.6	1.9	1.2	Metal ores and scrap	15.1	1.0	0.3
Electrical car equipment, etc.	9.7	1.1	1.8	Organic compounds	9.2	0.6	0.5
Electrical measuring instruments	9.4	1.1	0.5	Pulp and paper	5.6	0.4	4.0
Total	862.4	100.0	1.0	Total	1,548.9	100.0	1.8

Source: Compiled by the author from Trade Statistics of Japan, Ministry of Finance, Japan.

3. Trade between Japan/Kansai and Russia, and their trade dependence on Russia

Finally, we examine Japan's and Kansai's trade with Russia (imports and exports) by trade good category using data from the Ministry of Finance.

(1) Trade between Japan and Russia

Japan's exports to Russia in 2021 totaled 862.4 billion yen, and imports were 1,548.9 billion yen. Russia's share in Japan's total imports and exports is around 1.0% for exports and 1.8% for imports, indicating that Japan's dependence on trade with Russia is not high (Table 2-CA-4).

Among Japan's top 10 exports to Russia, automobile-related goods account for more than 50% of total exports. Automobiles (41.5%) accounts for high proportion of exports, followed by automotive parts (11.6%), construction and mining equipment (6.7%). On the other hand, imports are dominated by energy-related goods, raw materials: natural and manufactured gas (24.0%), petroleum and its derivatives (19.1%), nonferrous metals (18.9%), coal, coke and briquettes (18.3%), seafood and its products (8.9%), and lumber (3.4%).

Although Japan's dependence on Russia with regard to exports is low, dependence on Russia for rubber products (5.3%) and construction and mining equipment (4.4%) is high compared to Japan's overall export dependence on Russia (1.0%). On the other hand, relative to Japan's total imports from Russia (1.8%), imports of lumber (13.1%), nonferrous metals (10.3%), coal, coke, and briquettes (9.8%), and seafood and fish products (9.1%) are high. The suspension of these imports is expected to have a significant impact on the construction, energy, and food and beverage industries.

(2) Trade between Kansai and Russia

Kansai's exports to Russia amounted to 143.1 billion yen, and imports from Russia were 141.4 billion yen in 2021. Compared to Japan as a whole, whose dependence on Russia is 1.0% for exports and 1.8% for imports, Russia's share in Kansai's trade is lower: 0.8% for exports and 0.9% for imports (Table 2-CA-5).

Among Kansai's top 10 exports to Russia, construction and mining

Table 2-CA-5 Kansai's trade with Russia and dependence on Russia

Kansai's exports to Russia				Kansai's imports from Russia			
Trade good category	Billion yen	Share of total exports to Russia (%)	Dependence on Russia (%)	Trade good category	Billion yen	Share of total imports to Russia (%)	Dependence on Russia (%)
Construction and mining equipment	42.4	29.6	6.5	Natural and manufactured gases	63.9	45.2	7.5
Auto mobiles	23.6	16.5	10.9	Coal, coke and briquettes	29.2	20.7	11.8
Engines and motors	9.4	6.6	1.8	Seafood and related products	12.4	8.7	5.4
Cargo handling machinery	8.1	5.6	5.0	Iron and steel	9.1	6.4	2.9
Automotive parts	6.2	4.3	2.7	Non-ferrous metals	5.3	3.8	1.8
Re-exported products	5.5	3.8	0.5	Petroleum and related products	2.7	1.9	0.4
Rubber products	3.9	2.7	3.2	Metal ores and scrap	2.1	1.5	0.5
Petroleum products	3.2	2.2	2.3	Organic compounds	2.1	1.5	0.4
Pumps and centrifuges	3.2	2.2	1.2	Tobacco	2.0	1.4	0.7
Organic Compounds	2.1	1.4	0.5	Inorganic compounds	1.2	0.9	0.5
Total	143.1	100.0	0.8	Total	141.4	100.0	0.9

Source: Compiled by the author from Trade Statistics of Japan, Ministry of Finance, Japan.

equipment (29.6%) tops the list, followed by automobiles (16.5%), prime movers (6.6%), cargo handling machinery (5.6%), and parts of

automobiles (4.3%). Imports, on the other hand, are dominated by natural and manufactured gas (45.2%), coal, coke and briquettes (20.7%), fish and seafood (8.7%), and iron and steel (6.4%).

Relative to Russia's share in Kansai's total exports (0.8%), dependence on Russia is the highest for automobiles (10.9%), construction and mining equipment (6.5%), and cargo handling machinery (5.0%). On the other hand, Relative to Russia's share in Kansai's total imports (0.9%), dependence on Russia is the highest for coal, coke and briquettes (11.8%), natural gas and manufactured gas (7.5%), and fish and shellfish and fish products (5.4%). Kansai is clearly more dependent on Russia for coal, coke, and briquettes than Japan as a whole.

4. Conclusion

This analysis has shown that the direct impact of Russia's invasion of Ukraine on EU-Russia trade has been noticeable, especially with regard to energy-related goods. This is due to the fact that the EU's dependence on Russia for iron, coal and coal briquettes, and petroleum and its products is very high.

The economic sanctions against Russia by NATO countries and Russia's retaliation with regard to energy-related goods have increased the possibility of an economic slowdown in the EU economy. The escalating situation in Ukraine is forcing the EU to break away from its energy dependence on Russia, but the adjustment will take time and will exert downward pressure on the EU economy for some time.

On the other hand, Japan's overall dependence on Russian imports is low as a whole. However, dependence on lumber, nonferrous metals, coal, and fish and seafood products from Russia is relatively high. Kansai's economy is also highly dependent on Russian imports of coal, coke and briquettes, natural gas and manufactured gas, and fish and seafood products, with the level of dependence on coal, coke, and briquettes being higher than that of Japan as a whole. Therefore, the suspension of imports of these goods would have a significant impact on the construction, energy, and food services industries.

Finally, with regard to the indirect impact of the worsening situation in Ukraine on the economies of Japan and Kansai, the key factor to

consider is the trade dependence between the EU and China. As shown earlier, the EU is highly dependent on Russia, especially for energy-related goods, and if imports of energy-related goods from Russia were to cease, the EU economy would be forced to slow down. A slowdown in the EU economy will exert downward pressure on the Chinese economy through a slowdown in China's exports to the EU.

Figure 2-CA-1 above also shows the dependence of trade ties between China and Japan and the Kansai region. Japan's exports to China account for 21.6% (\$163.9 billion) of its total exports, and its imports from China account for 24.0% (\$185.7 billion) of its total imports. The shares for Kansai are noticeably higher, respectively 26.2% and 32.3%, suggesting that Kansai's economy is characterized by a high degree of dependence on China. Therefore, a slowdown in the EU economy might indirectly exert downward pressure on Kansai's economy through its impact on the Chinese economy.

This is an example of the indirect effects of the escalating situation in Ukraine. When considering the economic impact of Russia's invasion of Ukraine, it is important to take both direct and indirect effects into account.

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