

The War in Ukraine and its Implications for the Korean Economy

By Yeo Han-koo and Wonho Yeon

Korea and Ukraine are located on the opposite ends of the Eurasia landmass, thousands of miles apart, but one year into the Ukraine war, it turns out that the ramifications of the Ukraine war on the Korean economy are significant despite the sheer distance between the two.

Both countries are adjacent to Russia on its northern and eastern ends. Such geography has inevitably shaped their complex interactions throughout their histories. They have navigated the thin ice of the Cold War and afterwards explored newfound economic cooperation opportunities with Russia. During the turbulent modern history of Korea, the Soviet Union was at times a war adversary that had empowered the communist North's invasion of South Korea in 1950. After the fall of the Soviet Union, Russia emerged as a potential partner to collaborate with for peace and prosperity on the Korean Peninsula. Against this backdrop, Korea has slowly, but cautiously forged a not-too-close, but not-too-far economic relationship with Russia and to a lesser extent with Ukraine. As a result, Russia's invasion of Ukraine is negatively affecting the Korean economy through direct and indirect channels.

This paper begins with an overview of Korea's economic relations with Russia and Ukraine and the immediate impact of the war, particularly on trade. Longer-run implications on global supply chains, Korea's export control system, diversification of energy supplies and arms exports are then discussed. The paper concludes with the implications for the future.

The Evolution of Korea's Economic Relations with Russia and Ukraine

During the Moon Jae-in administration, Korea took a more strategic view of Russia and the Commonwealth of Independent States, including Ukraine, in order to build the "Northeast Asia Plus Responsible Community." Its

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long-term vision was to promote peace and prosperity in the region through engagement with North Korea. President Moon announced a so-called “New Northern Policy” in the early days of his presidency in 2017, making it a flagship foreign and international economic policy initiative, along with the “New Southern Policy” that aims to expand the comprehensive partnership with the 10 ASEAN countries and India as a new priority region.¹

In the annual Eastern Economic Forum in Vladivostok held in September 2017, the Korean government announced the “Nine Bridges” initiative with Russia, the signature initiative of the New Northern Policy. The Nine Bridges strategy identified nine priorities for promising economic cooperation between the two countries, including gas, electric energy, railroad, shipbuilding, ports, Arctic shipping routes, fisheries, agriculture, and job creation. For example, the “gas bridge” aimed to expand LNG imports from Russia in part by building a trans-Korean gas pipeline covering thousands of kilometers to connect the Sakhalin with North and South Korea. This project is inconceivable from today’s vantage point in the context of the gas pipelines connecting Russia-Ukraine-Europe, but at that time was hailed as a futuristic project worth developing. The “railroad bridge” focused on reconstructing the Trans-Korean Railway connecting South and North Korea and connecting it to the Trans-Siberian Railway. Other areas of significance were shipbuilding, ports, and the Arctic shipping routes, which each reflected the active business cooperation that had been developing between Russia and Korea. Russia wanted to modernize its ports and shipbuilding industry, and needed a partner to build high-tech, sophisticated LNG ships, especially ice-breaker LNG tankers to navigate Arctic shipping routes. Korea was a perfect partner to provide what Russia lacks. There have also been proposals for ambitious electric energy projects to exploit abundant renewable energy in Northeastern China, Mongolia and Russia by building transmission lines connecting all these countries and supplying clean energy across Northeast Asia.²

All in all, the New Northern Policy was a worthwhile effort to reset Korea’s strategic relationship with the continental players surrounding the Korean Peninsula, in particular Russia, in relation to North Korea. However, despite the idealistic vision and ambitious ideas, most of the projects have not progressed because of broader geopolitical circumstances, especially western sanctions on North Korea as well as Russia. Since the launch of the New Northern Policy in 2017, bilateral trade (in USD value) picked up 41.3% and 31.0%, respectively in 2017 and 2018 (Table 1). However, with the pandemic, bilateral trade lost momentum, falling around 22%, except for a temporary spike in 2021.

Table 1. Annual Korea-Russia Trade in Goods (2012-2022)

(in million USD, %)

| | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|-------------|--------|--------|--------|---------|---------|--------|--------|---------|---------|--------|---------|
| Exports | 11,097 | 11,149 | 10,129 | 4,686 | 4,769 | 6,907 | 7,321 | 7,774 | 6,900 | 9,980 | 6,328 |
| YoY | (7.7) | (0.5) | (-9.1) | (-53.7) | (1.8) | (44.8) | (6.0) | (6.2) | (-11.2) | (44.6) | (-36.6) |
| Imports | 11,354 | 11,495 | 15,669 | 11,308 | 8,641 | 12,040 | 17,504 | 14,567 | 10,630 | 17,357 | 14,817 |
| YoY | (4.6) | (1.2) | (36.3) | (-27.8) | (-23.6) | (39.3) | (45.4) | (-16.8) | (-27.0) | (63.3) | (-14.6) |
| Total Trade | 22,451 | 22,644 | 25,798 | 15,994 | 13,410 | 18,947 | 24,825 | 22,341 | 17,530 | 27,337 | 21,145 |
| | (6.1) | (0.9) | (13.9) | (-38) | (-16.2) | (41.3) | (31) | (-10) | (-21.5) | (55.9) | (-22.6) |

Source: Korea International Trade Association (KITA)

The Impact of the War in Ukraine on the Global Economy

Russia's invasion of Ukraine and the subsequent Western economic sanctions against Russia had a negative impact on the economies of both Ukraine and Russia, as well as the global economy, which had been recuperating from the COVID-19 pandemic.

Although it appears that Russia has not suffered as severe an economic blow as initially anticipated, the effects of Western economic sanctions are expected to emerge gradually, resulting in a protracted economic downturn. Russia's Ministry of Finance predicted a 10% decline in real GDP at the beginning of the war,³ but the International Monetary Fund (IMF) World Economic Outlook in April 2023 estimated that Russia's GDP had declined by only 2.1% last year.⁴

Given the size of the Russian and Ukrainian economies, it is difficult to conclude that they directly harmed the global economy. Russia's nominal GDP in 2021 of USD 1.8 trillion (11th in the world) accounted for 1.8% of world GDP, while Ukraine's nominal GDP of USD 0.2 trillion accounted for only 0.2% (54th in the world).⁵ However, their significance lies in the fact that they export large amounts of food, minerals, and energy resources. The Ukraine crisis has had a significant impact on the global economy and financial markets, as evidenced by rising food and energy prices.

Before the Ukrainian crisis, the IMF predicted that the global economic growth rate for 2022 would be 4.4%, but in April 2023 it was estimated to be 3.4%. One percentage point was subtracted from the global real GDP growth rate compared to expectations before the invasion, though not all of the growth

slowdown can be attributed to the Russian invasion of Ukraine. In 2022, global GDP was approximately USD 1 trillion less than expected. This is equivalent to the disappearance in one year of an economy the size of Indonesia or the Netherlands. The IMF projects that the global economic growth rate will slow further to 2.8% in 2023.⁶

The OECD's March 2022 *Economic Outlook* estimated that the Russian invasion of Ukraine would add 2.5 percentage points to the rate of inflation in consumer prices around the world.⁷ In addition to the swift demand recovery that followed the decline of COVID-19, the Ukraine crisis resulted in high inflation and interest rate hikes, mainly by rising energy and food prices, both of which are detrimental to global economic growth.

Energy and food price fluctuations have a significant impact on the lives of the poor, particularly in emerging and developing nations. For instance, according to a recent IMF report, sub-Saharan Africa's dependence on wheat imports reached 85%, and food accounted for more than 40% of consumer spending, implying that a sharp increase in global food prices would harm these economies.⁸ In addition, with the western sanctions on Russian crude oil, demand for crude oil from other regions soared and the price of crude oil skyrocketed, adding to the economic burden of many developing nations. As of December 2022, the price of Russia's Ural crude oil was approximately USD 50 per barrel, while Europe's Brent crude oil and the Middle East's Dubai crude oil were both approximately USD 80 per barrel, creating a significant price differential with Russian crude oil.⁹

The Ukraine War's Impact on the Korean Economy

As an open, mid-sized economy, Korea is vulnerable to a global economic slowdown, which would have a negative impact on Korea's exports and imports. For Korea, one of the major energy importers in the world, rising energy prices impose a significant economic burden. Since April 2022, Korea's trade balance has been negative, recording its first annual deficit in 14 years since 2008 (USD 13.3 billion) during the global financial crisis. Last year, the annual trade deficit reached a record high of USD 47.2 billion primarily due to increased energy imports.¹⁰

Zooming in on Korea's bilateral trade and investment position with the two countries, trade with Russia and Ukraine comprised 2.2% and 0.1%, respectively, of Korea's total trade in 2021.¹¹ Although Korea's trade exposure to the two combined is minimal, still the war affects the Korean economy through diverse channels especially on the supply side. In this section, we focus on Korea's supply chain links to Russia and Ukraine through trade and investment.

Korea's Trade and Investment Exposure to Russia

Russia was Korea's 10th largest trading partner in 2021, compared to 21st in 2010. After the breakout of war, trade has contracted significantly. Comparing bilateral trade during the one year before the invasion (March 2021 – February 2022) and after (March 2022 – February 2023), Korea's exports to Russia contracted by 45.7%, imports by 29.6%, and total trade by 36.5%, respectively (Figure 1).



Korea's ten largest export items to Russia consist primarily of manufacturing products, equipment, and intermediate goods. Automobiles and parts are the top export, together occupying approximately 40% of total trade in 2021, followed by steel products, machinery, etc. (Table 6 in Appendix). Most visibly, Korea's exports of automobiles and parts nosedived by almost 66% as Hyundai Motors' Russian factory stopped operations right after the war began, along with the old GM factory that it had acquired in 2021. As a result, Chinese carmakers' market share in Russia rapidly expanded from 9.5% right before the war, to 30.3% in November 2022, whereas the market share of Korean automobiles significantly decreased from 23.8% to 12% during the same period.¹² Machinery, equipment, and other manufacturing export items followed a similar pattern as well.

On the other hand, Korea's ten largest imports from Russia are heavily concentrated on energy resources, comprising almost 76% of total imports in 2021. If minerals and raw materials such as platinum, aluminum, and uranium are included, another 10% would be added (Table 7 in Appendix). As expected, Korea's energy imports from Russia have decreased overall, but in 2022 coal emerged as the top import from Russia with big increase of 122% mainly due to the steep price hikes.

It is worth noting that Russia had been the second-largest core supplier of platinum to Korea, but after the war, its supply stopped almost completely since July 2022. The supply void left by Russia was filled by South Africa, Japan, and the U.K., proving the importance of supply chain diversification in critical raw minerals and materials.

Korean investment in Russia was concentrated on manufacturing such as automobiles, electronics, steel, machinery, and construction from the 2000s and it slowly expanded to services such as hotels more recently. Korea's direct investment flows to Russia jumped 24% in 2021 to USD 130 million, recovering from the pandemic, but again declined 55% in 2022 due to the direct effect of the war (Table 2).

Table 2. Korea's Investment in Russia

(Million USD, %)

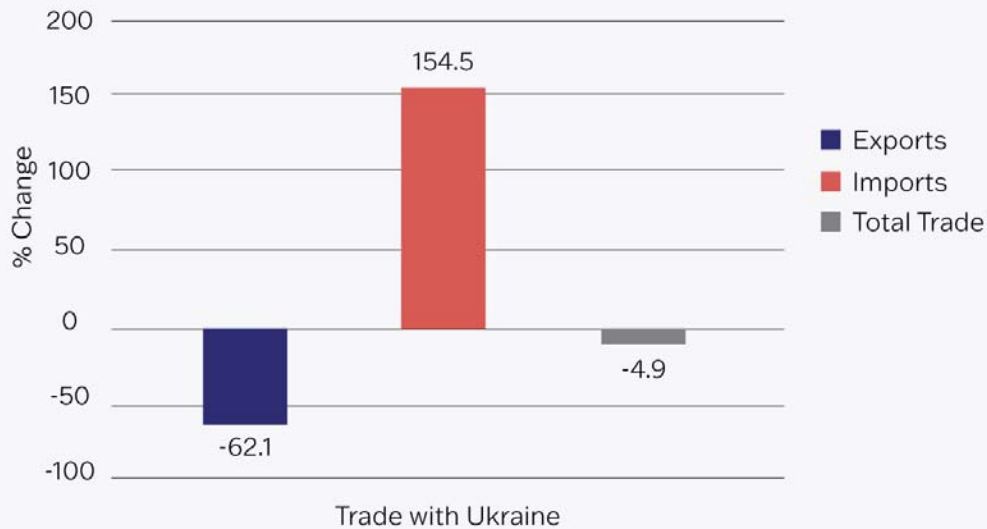
| | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|--------------|-------|------|------|-------|-------|------|
| Outbound FDI | 81.8 | 94.5 | 98.9 | 105.2 | 130.2 | 59.1 |
| % Change | -11.9 | 16 | 5 | 6 | 24 | -55 |

Source: KOREA Eximbank (as of April 3, 2023)

Korea's Trade and Investment Exposure to Ukraine

Korea's trade with Ukraine remained small, as it is only its 68th largest trading partner. However, it is important due to specific links to the supply chains of some key raw materials and grains. During the year following the invasion, Korea's exports to Ukraine decreased significantly by 62.1% when compared to the year earlier. However, Korea's imports from Ukraine have increased by a whopping 154.5%. As a result, total trade only modestly decreased by 4.9% (Figure 2).

Figure 2. Korea's Trade with Ukraine One Year Before and After the War in Ukraine
(March 2022 to February 2023 compared to the year earlier)



Source: Korea International Trade Association (KITA)

Korea's ten largest export items to Ukraine prior to the war consisted of manufacturing products, notably automobiles and parts, steel products, cosmetics, machinery, etc. As for Russia, the top export item was automobiles and parts comprising 28.9% of total exports in 2021, but exports of these products have decreased since the invasion (Table 8 in Appendix). On the other hand, Korea's ten largest import items from Ukraine were mostly focused on a few agriculture items in 2021, such as wheat and meslin (27.2% of total imports), maize (19.1%), and sunflower seed and oil (11.3%) and critical materials such as hydrogen, rare gases (9.5%), iron ore (4%), ammonia (3.1%) and titanium (2.4%) (Table 9 in Appendix). The reasons for a sudden spike in Korea's imports from Ukraine after the invasion are due to the import of maize and rare gases. The import of maize for animal feed shot up by 755% emerging as the top import item in 2022. Also, the skyrocketing price of rare gases contributed to the import surge in value terms.¹³

Korea's investment in Ukraine has been minimal, but POSCO International's USD 63 million investment in the grain terminal located in the port of Mykolaiv, Ukraine is noteworthy.¹⁴ It is the owner and operator of Korea's first overseas grain terminal, showcasing the increasing importance of food security as a strategic business area for Korean firms.

Key Areas of Direct Impact to the Korean Economy

As shown in the previous section, the overall exposure of the Korean economy to Russia and Ukraine is somewhat limited, but Korea is connected to the two economies through various direct and indirect links. This section will go into these links in more detail and analyze how the Ukraine war and its links to Korea affect the Korean economy, particularly in the following areas: 1) global supply chains in critical materials and key manufacturing sectors with Korean companies' investment; 2) Korea's imports of energy resources and energy price increases; 3) Korea's export controls against Russia along with allies and partners after the outbreak of the war; and 4) other strategic areas such as the defense industry.

Global Supply Chain Disruption

Ukraine plays a key role in the supply chains of rare gases such as neon, krypton and xenon, the essential materials for high-precision semiconductor manufacturing. Because of the big presence of the semiconductor industry, Korea's reliance on Ukraine for rare gases has had an oversized importance. In 2021, Korea's imports from Ukraine of neon, krypton and xenon were 23%, 30.7% and 17.8%, respectively, of its total worldwide imports of such gases.¹⁵ With the Russia-Ukraine conflict looming, Korean businesses were concerned about the possible disruption of rare gas supplies due to the war and had prepared for such a contingency by stacking up inventories and searching for alternative sources. The Korean government also cut the tariff on the rare gases from 5.5% to zero temporarily to minimize another supply chain shock.¹⁶

The supply chain disruption for neon caused by the war in Ukraine is especially illuminating. As the war dragged on, the concerns on the possible supply chain disruption of neon, which is essential for the lithography process in the semiconductor industry, materialized. According to a CNN report, prior to the war, Russia and Ukraine provided about 30% of the world supply of neon to semiconductor industries.¹⁷ Russia collected raw neon as a byproduct in its steelworks, then sent it to Ukraine for purification. The two countries have been leading producers of rare gases and used them to build military and space technologies since the Soviet Union era. However, the war damaged the key industrial sites in Ukraine and made it extremely difficult to export goods from the region. To make things worse, Russia introduced export restrictions on rare gases, including neon, to "unfriendly" countries in May 2022, including the U.S., EU, and Korea, who had earlier joined export controls against Russia. This supply shock makes China a big winner, as its expanded capacity for rare gas production made it the largest producer. According to Korean Customs data, the price of neon continued to rise and by June 2022, had skyrocketed 52 times to USD 2.9 million per ton from USD 55,700 a year earlier, resulting in

imports of neon soaring almost 300 times to USD 396 million in 2022 from USD 1.3 million in 2021, (Figure 3). Due to supply difficulties from both nations, Korean semiconductor manufacturers began to shift their supply sourcing to Chinese firms, which have profited greatly from the current crisis.



How Korean businesses and the government responded to this supply chain shock is worth noting. In fact, Korea had just gone through another supply chain crisis related to urea in November 2021 when China restricted the export of urea (see below). Realizing the vulnerability of supply chain dependence on foreign sources for critical materials, Korean businesses intensified their efforts to internalize such critical nodes of the supply chain by developing indigenous technologies with government support and were able to replace a significant portion of neon previously imported from Russia and Ukraine by domestic production over the course of the war in Ukraine.

Sweeping Measures of Export Control

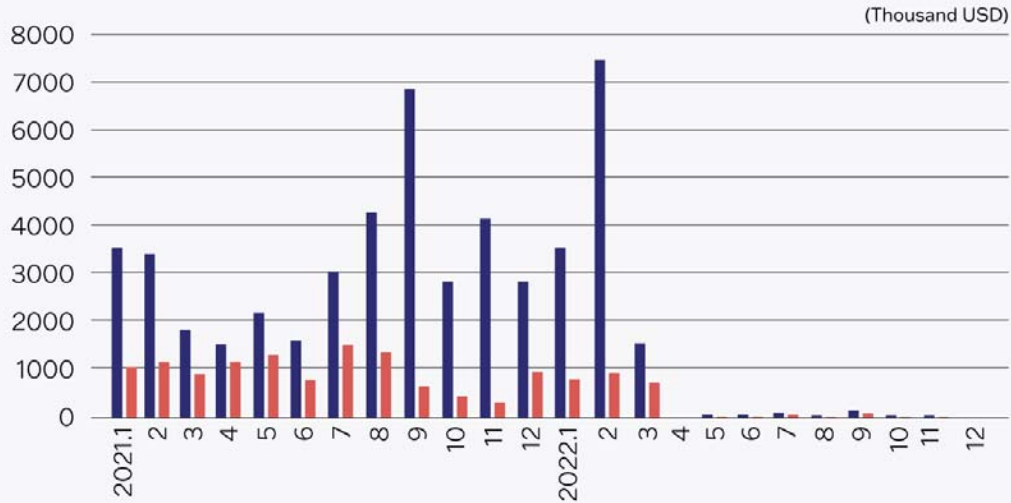
With Russia's invasion of Ukraine looming, Korea began to discuss ways to strengthen its export control regulations. After Russia invaded Ukraine, Korea and many other countries, including the G7, intensified sanctions against Russia. Russia was subsequently isolated from the international financial system and global economy.

Nonetheless, in the early days of the sanctions against Russia, Korea had some initial challenges. Korea's export control regime did not have any legal basis nor prior experience imposing an independent export control of non-strategic items outside the boundary of the four multilateral export control regimes - the Nuclear Suppliers Group (NSG); the Australia Group (AG); the Missile Technology Control Regime (MTCR); and the Wassenaar Arrangement (WA). While Korea contemplated its response, the U.S. and other allies and partners went ahead and announced sweeping export control measures, including the foreign direct product rule (FDPR) application, on February 24, 2022.¹⁸

The FDPR is a restriction that allows the U.S. government to prohibit exports of products manufactured by foreign companies outside the U.S. if they use U.S.-controlled software or technology. On February 24, 2022, the U.S. Department of Commerce imposed FDPR on Russia on 57 items under the categories of electronics and semiconductors, computers, telecommunications, information security, sensors and lasers, navigation and avionics, maritime, and aerospace. At the time of the announcement, 32 countries, including 27 European Union (EU) nations, Australia, Canada, Japan, New Zealand, and the United Kingdom, which had agreed to impose similar sanctions on Russia as the United States, were exempt from the application of the FDPR, but Korea was not. The fact that Korea was not among the participating and the FDPR exception countries created a major controversy and outcry in Korea.¹⁹

A few days later, on March 8, 2022, an intensive discussion with the U.S. to align Korea's export controls against Russia to the similar level with the other countries was finalized. When the Korean government joined in with its own export control measures, the U.S. decided to exempt Korea from the FDPR. The Korean government is now using catch-all regulations to control the export of the 57 items to Russia. Taking semiconductors, the item that the U.S. is most concerned about, as an example, trade data shows that there was no export of semiconductors from Korea to Russia after March 2022 (Figure 4). Moreover, due to these export control policies, representative Korean companies operating in Russia have suspended their business. According to the Yale database, which only includes data on six major Korean companies, Hyundai Merchant Marine LG Electronics and Samsung stopped all production in Russia (Table 3).

Figure 4. Trends in Korea's Exports of Semiconductors to Russia



Source: Korea International Trade Association (KITA)

Table 3. Number of Companies Leaving and Staying in Russia

| | Suspension | Withdrawal | Digging In | Scaling Back | Buying Time | Total |
|----------------|----------------|----------------|----------------|---------------|----------------|------------------|
| Total | 502 (31.8%) | 520 (32.9%) | 234 (14.8%) | 148 (9.4%) | 177 (11.2%) | 1581 (100.0%) |
| United States | 164 (35.9%) | 164 (35.9%) | 27 (5.9%) | 55 (12.0%) | 47 (10.3%) | 457 (100.0%) |
| Germany | 37 (25.2%) | 43 (29.3%) | 27 (18.4%) | 19 (12.9%) | 21 (14.3%) | 147 (100.0%) |
| United Kingdom | 43 (33.6%) | 67 (52.3%) | 7 (5.5%) | 4 (3.1%) | 7 (5.5%) | 128 (100.0%) |
| France | 21 (25.3%) | 18 (21.7%) | 27 (32.5%) | 5 (6.0%) | 12 (14.5%) | 83 (100.0%) |
| Japan | 36 (47.4%) | 11 (14.5%) | 14 (18.4%) | 5 (6.6%) | 10 (13.2%) | 76 (100.0%) |
| China | 5 (9.6%) | 1 (1.9%) | 41 (78.8%) | 1 (1.9%) | 4 (7.7%) | 52 (100.0%) |
| South Korea | 5* (83.3%) | (0.0%) | 1** (16.7%) | (0.0%) | (0.0%) | 6 (100.0%) |

*Hyundai Merchant Marine, Korean Air, Hyundai, LG Electronics, Samsung

** Posco is operating through a Russian subsidiary

Source: Yale School of Management. <https://som.yale.edu/story/2022/over-1000-companies-have-curtailed-operations-russia-some-remain>

As the current Russian war in Ukraine is prolonged, major countries such as the U.S. and EU are continuously expanding export controls against Russia. On February 24, 2023, the first anniversary of the outbreak of the war, the U.S. announced its 7th additional export control measures against Russia and the EU also strengthened export controls through the 10th sanctions package.²⁰

In this regard, the Korean government, which has been closely coordinating export control measures against Russia with the international community, has also prepared for an amendment and announced an administrative notice to add 741 items to the existing 57 catch-all controls against Russia, such as industrial machinery, steel and chemicals, automobiles costing more than USD 50,000, oil and gas refinery equipment, and quantum computers, that can be diverted as weapons to the 'situational permission' items for international cooperation on export control against Russia.²¹ Thus far, export control measures have had a limited impact on Korea's overall exports to Russia because the number of items under export control was limited. However, the recent expansion of export controls against Russia is expected to have a greater impact on Korea's exports to Russia in the future.

Korea has been seriously discussing further upgrading its export control system. The existing export control system in Korea does not take into account independent export controls beyond the boundary of the four aforementioned multilateral export control regimes for international peace and stability, nor does it include new export controls based on human rights issues. In the case of a multilateral export control system related to national security, it is likely a new international export control system would be established among like-minded nations, as the 1996 Wassenaar Agreement is insufficient to address the present security threat.

Diversification of Energy Resources

Immediately after Russia's invasion of Ukraine when the energy crisis-hit EU sought help from its partners, Korea swiftly responded by diverting some of its LNG imports from the Middle East to the EU. Korea also joined international efforts to cool surging oil prices by releasing a record 11.65 million barrels of strategic petroleum reserves.²² The Russian invasion of Ukraine has had a consequential impact on the overall energy and climate change circumstances in the EU, sparking an existential energy crisis, but also accelerating unprecedented green energy transition in the EU.

But, in the case of Korea, the impact of the war on the energy sector has been more indirect, manifest in rising energy prices and a soaring trade deficit. As shown in Table 4, the price of crude oil, LNG and coal spiked 39%, 128% and 161%, respectively, in 2022. Imports of crude oil, gas and coal combined increased by USD 78.4 billion, amounting to USD 190 billion in 2022, which is 26.1% of Korea's total imports. As a result, Korea recorded a record high trade deficit in 2022 despite increasing exports, as noted above.

Table 4. Changes in Energy Prices and Korea's Energy Imports by Energy Sources, 2021-2022

| | Crude Oil (Dubai Crude Oil) | | LNG (JKM) | | Coal (Australian Coal) | |
|-----------------|-----------------------------|---------------|-----------|--------------|------------------------|----------------|
| | 2021 | 2022 | 2021 | 2022 | 2021 | 2022.1.1~12.25 |
| Prices* (YoY) | 69.41 | 96.41 (39%) | 15.04 | 34.24 (128%) | 138.33 | 361.18 (161%) |
| Imports** (YoY) | 670 | 1,058 (57.9%) | 308 | 568 (84.4%) | 145 | 281 (93.8%) |

*Units: \$/bbl(Crude Oil), \$/Mmbtu(LNG), \$/ton(Coal)

**Units: 100 million \$

Source: Ministry of Trade, Industry and Energy, Republic of Korea

Korea imports almost 92% of energy from overseas, but its exposure to Russia is somewhat limited (Table 5). Before the war in 2020, the import of crude oil from Russia made up 4.8% of Korea's total crude oil imports, which made it the 8th largest importer of Russian oil in the world. After the war began, imports of Russian oil decreased to 2% of Korea's total crude oil imports in 2022, dropping it to the 10th largest importer of Russian crude. LNG imports from Russia made up 5% of Korea's total LNG imports before the war but decreased to 4.2% in 2022, yet in both instances it remained the 7th largest importer of Russian LNG. Among energy resources, bituminous coal was the most substantial import. Coal from Russia accounted for 20.2% of Korea's total coal imports, making it the world's 2nd largest importer of Russian coal. Yet even after the start of the war, and despite concerted efforts by the government to secure coal imports from other sources such as Australia and Indonesia, Korea's imports of Russian coal remained at a similar level, making up 20.7% of its total coal imports.

Korea's dependence on Russia for enriched uranium is of greater concern. Korea depends on Russia for nearly 41% of its enriched uranium imports, which is greater than it was prior to the conflict.²³ However, Korea has recently begun to consider diversifying its procurement of enriched uranium to mitigate the

vulnerability of the supply chain for such critical raw materials necessary for nuclear power generation. In summary, Korea's energy dependence on Russia is quite limited except for coal and uranium, but the Korean government has taken actions to diversify energy imports away from Russia.

Table 5. Korea's Energy Imports in Russia

| Energy Source | 2020 | | | 2022 | | |
|------------------|-----------|-----------|------|-----------|-----------|------|
| | Imports** | Share (%) | Rank | Imports** | Share (%) | Rank |
| Crude Oil | 46,928 | 4.8 | 8 | 20,984 | 2 | 10 |
| Coal* | 23,285 | 20.2 | 2 | 24,390 | 20.7 | 3 |
| LNG | 2,019 | 5 | 7 | 1,962 | 4.2 | 7 |
| Enriched Uranium | 224 | 30.9 | 1 | 184 | 40.9 | 1 |

*Units: \$/bbl(Crude Oil), \$/Mmbtu(LNG), \$/ton(Coal)

**Units: 100 million \$

Source: KOREA Eximbank (as of April 3, 2023)

Emergence of Defense Industry Exports

In an unexpected turn of events, Russia's invasion of Ukraine and ensuing escalation of military tensions around the world are boosting new opportunities for Korea's arms exports. According to the Korea Institute for Industrial Economies and Trade, the global defense budget is expected to increase by additional USD 2 trillion during the next ten years, and the global arms procurement budget by USD 600 billion.²⁴ As the Ukraine war fundamentally shifts geopolitical dynamics around the world, countries in Eastern Europe, the Indo-Pacific and the Middle East are vying to build up their defense capability. Despite the exploding global demand, there are not many countries capable of expanding their arms productions in a short period of time.

Against this backdrop, Korea is uniquely positioned to ramp up its arms production rapidly building on its sophisticated technology and robust manufacturing ecosystem developed over time with steel, machinery, automobile, chemical, semiconductor and IT industries. The seven decades of military confrontation with North Korea has maintained the edge of Korea's defense industry. In 2022, Korea's arms export hit a record USD 17.3 billion, making it the 8th largest exporter with 2.8% of global arms exports, compared to 13th and 1% in the previous five years, according to the Stockholm International Peace Research Institute.²⁵

Such opportunities come with challenges as well. Korea is prohibited from the export of arms except for a peaceful purpose, which does not allow direct export of arms to countries engaged in military conflicts. Korea is facing international pressure to aid Ukraine directly.²⁶ Korea has supported the U.S. and its allies by selling them arms to replace their arms supplied to Ukraine. Although Korea's alignment with the U.S. and the West has been unequivocal, its armistice status with North Korea and Russia's potential sway over its northern neighbor creates complicated issues for Korea, which hopes to avoid antagonizing Russia in case of any future contingency.

Lessons Learned: Ramification for the Future

This year marks the 70th anniversary of the Korean Armistice Agreement signed on July 27, 1953, bringing a halt to the Korean War. Two months later, the Mutual Defense Treaty between the United States and the Republic of Korea was signed on October 1, 1953, which was the starting point of a seven-decade long military alliance. Indeed, it is an irony of history that some experts look to the Korean War for lessons as parallels to the war in Ukraine, especially in this special commemorative year. By geographical standards, the Russian invasion of Ukraine is a regional conflict. However, its economic and geopolitical ramifications are truly global and leave some important lessons for Korea.

The Accelerating Fragmentation of the Global Economy

There are concerns the war in Ukraine will accelerate the fragmentation of the world economy, which has continued to progress in recent years. The fault line between the democratic world led by the U.S. and G7 that had swiftly imposed sweeping economic sanctions against Russian aggression, and the authoritarian world that strengthens their solidarity manifested by the “no limits” partnership between China and Russia keeps widening and deepening. Amid strong economic sanctions by the West, the flow of goods and energy to and from Russia continues with China, India, and others. The war, international sanctions and their aftermath have significant ramifications in Northeast Asia where tensions surrounding the Taiwan Strait and on the Korean Peninsula are still alive and real.

Recent discussion in the Indo-Pacific Economic Framework (IPEF) is a revealing case. In the digital trade area, the common concept widely adopted through the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) and the United States, Mexico, and Canada Agreement (USMCA), “free flow of cross-border data,” was replaced by a new value-driven term, “trusted and secure cross-border data flows” in the IPEF Ministers’ Statements

in September 2022.²⁷ This can be seen as a symbol of the transition to an era of trade based on “trust and values” rather than on “free trade” alone. In a report published last summer, the WTO predicted that if a full-scale division and decoupling of the world economy occurs, the flow of not only goods, but also information, knowledge, technology, and ideas will be blocked, which would decrease world GDP by about 10% annually.²⁸

As noted above, Korea joined the U.S. and the West in imposing export controls against Russia. It was an unprecedented move for Korea because its existing export control regime does not consider taking independent export controls outside of the four multilateral regimes. Targeting the historic great power and center of the “New Northern Policy,” which could influence North Korea to the disadvantage of South Korea, was not an easy choice, but the brutality of the aggression was so grave that Korea was able to bring itself into alignment with the West swiftly with strong support from the public. It was completely different from the Russian aggression in Crimea in 2014 when Korea did not join the West-led export controls against Russia.

This is an important case for Korea as it took a more assertive posture on this kind of geopolitical matter and lived up to the demands and expectations from the West with its enhanced international standing as a top 10 economy and G7+ invitee. This precedent will serve as a new benchmark when Korea explores its suitable place as a trusted global leader in other international affairs.

Supply Chain Resilience and Economic Security

Korea is one of the countries that is most vulnerable to the risks related to geopolitical tension and supply chain disruptions. Korea’s participation in the global value chain and the proportion of manufacturing in its GDP are one of the highest among developed countries. Korea’s trade with China is bigger than that of the U.S. and Japan combined.

Against this backdrop, Korea experienced its first major supply chain crisis with urea in November 2021. In Korea, urea is used as a diesel exhaust fluid and is required in diesel vehicles to reduce greenhouse gas emissions. Korea depended on China for more than 95% of its supply of urea. When China tightened its export restrictions on urea, Korea faced a sudden supply shock in which millions of truck fleets could stop at any moment and the daily lives of Koreans could be severely affected. It was a big wake-up call to Korea, demonstrating the risks of depending too heavily on one country for a large share of a product or a material, even if it is a low-tech commodity with no sophisticated technology required.²⁹

The Russian war in Ukraine offers additional lessons to Korean businesses that they need to factor geopolitical risks into their investment and supply chain management. Korean companies that were more active in investing in and cultivating post-Soviet markets have now realized that Korea could be at the forefront of internationally coordinated actions when any geopolitical events of this scale and magnitude occur. Although the supplies of rare gases from Ukraine and Russia accounted for approximately 17-31% of Korea's total supply, well below China's 95% of urea, it would have been significant enough to deal a severe blow to the semiconductor industry. Despite initial concerns by the businesses and government alike, they were able to weather the storm relatively better than the urea crisis only a few months before.

The challenge is that such a transition from supply chain "efficiency" to supply chain "resilience and security" will inevitably accompany additional costs and inflationary pressure across the supply chains with the buildup of domestic production facilities, more stockpiles and inventories and redundant sourcing, which may not necessarily fit naturally well with profit-maximizing businesses. The question is how the government can intervene and to what extent in areas that have been left to the "invisible hand" of the market to make sure that resilience in the supply chains is secured for national and economic security.

Moreover, beginning with the urea crisis and then the case of rare gases from Ukraine and Russia, Korea has been awakened to the importance of international cooperation to strengthen supply chain resilience. Korea actively joined the U.S.-led Indo-Pacific Economic Framework from the very early stage of discussions in November 2021 while going through the urea supply crisis and made discussions on IPEF's supply chain pillar a high priority.

Energy Security and Energy Transition

The impact of the war in Ukraine on the energy sector differs between Korea and the EU. Given the EU's large exposure to Russia for its energy supply, the urgent energy crisis sparked by the Russia's gas cut-off has been an unprecedented motivation across Europe to push forward with desperate efforts to achieve energy independence and accelerate renewable energy. Korea's relatively small reliance to Russian energy was insufficient to spark the big energy transition to renewable and green energy for energy security seen in the EU.

With that said, the renewed interest in Korea and Europe in nuclear power generation offers promising new opportunities for collaboration. The Yoon Administration puts one of highest priorities in its energy policy on the revival and renaissance of nuclear power generation.³⁰ The UK and many countries in

the EU, including France, Poland, and the Czech Republic, are exploring a greater role for nuclear power as part of their transition to green energy and energy security. The big momentum created for renewable energy and nuclear power around the world is one of the unexpected positive effects from the war.

Enhanced Role as a Global Leader

One of the key lessons from the Russian aggression of Ukraine is that Korea stepped up to play a larger role on the world stage, thus taking a more serious responsibility in line with its growing influence in the international economic and geopolitical arena. It reflects the new economic reality as well as that export controls on critical industries and technologies would not be as effective without the substantial participation of Korea, particularly in the areas of semiconductors, batteries, and shipbuilding.

As such, the world should consider including Korea in more suitable multilateral and mini-lateral platforms for closer coordination and alignment with like-minded allies and partners. IPEF is a good example. Korea has a unique role to play by linking the U.S. and other partners in the region building on its eleven years of experience in implementing the Korea-U.S. Free Trade Agreement. However, it can go beyond the trade and economic field. For example, the G7 and QUAD can be good platforms to expand their membership to include like-minded partners like Korea, which would be critical for collaboration on supply chain resilience, sensitive technologies and their technology standards and export controls.

Appendix

Table 6. Korea's Top 10 Exports to Russia
(at the 4-digit HS Code Level)

| Rank | 2021 | | 2022 | | % Change (YoY) |
|------|--|-----------|--|---------|----------------|
| | Goods | Value | Goods | Value | |
| 1 | Motor Vehicles | 2,550,305 | Motor Vehicles | 894,036 | -64.9 |
| 2 | Parts and Accessories of Motor Vehicles | 1,367,732 | Structures, Parts of Structures of Iron or Steel | 601,877 | 23.6 |
| 3 | Structures, Parts of Structures of Iron or Steel | 486,914 | Parts and Accessories of Motor Vehicles | 453,544 | -66.8 |
| 4 | Self-Propelled Bulldozers, Graders, etc. | 336,888 | Self-Propelled Bulldozers, Graders, etc. | 304,016 | -9.8 |
| 5 | Cosmetics | 228,752 | Petroleum Oils | 232,622 | 66.2 |
| 6 | Flat-rolled Products of Iron or Non-alloy Steel (of a Width of 600 mm or more) | 186,421 | Costmetics | 221,344 | -3.2 |
| 7 | Machinery, Plant, or Laboratory Equipment | 160,960 | Polymers of Ethylene (in Primary Forms) | 196,869 | 30 |
| 8 | Polymers of Ethylene (in Primary Forms) | 151,463 | Vessels | 132,621 | 5.8 |
| 9 | Petroleum Oils | 139,947 | Instruments and Appliances Used in Medical, Surgical, Dental, or Veterinary Sciences | 124,890 | 28 |
| 10 | Vessels | 125,330 | Plates, Sheets, Film, Foil, and Strip of Plastics | 95,551 | -1 |

Source: Korea International Trade Association (KITA)

Table 7. Korea's Top 10 Imports from Russia
(at the 4-digital HS Code Level)

(Thousand USD)

| Rank | 2021 | | 2022 | | % Change (YoY) |
|------|--|-----------|--|-----------|----------------|
| | Goods | Value | Goods | Value | |
| 1 | Refined Petroleum Products | 4,657,281 | Coal | 5,695,286 | 121.9 |
| 2 | Petroleum Oils | 4,269,166 | Petroleum Oils | 2,314,472 | -45.8 |
| 3 | Coal | 2,566,238 | Refined Petroleum Products | 1,652,326 | 64.5 |
| 4 | Petroleum Gases | 1,715,065 | Petroleum Gases | 1,480,889 | -13.7 |
| 5 | Platinum | 592,882 | Fish (frozen) | 741,621 | 28.4 |
| 6 | Fish (frozen) | 577,603 | Crustaceans | 486,533 | 5.9 |
| 7 | Crustaceans | 459,215 | Unwrought Aluminium | 407,765 | 35 |
| 8 | Unwrought Aluminium | 302,060 | Ferro-alloys | 189,627 | -20.5 |
| 9 | Ferrous Waste and Scrap | 267,097 | Radioactive Chemical Elements and Radioactive Isotopes | 187,905 | -26.1 |
| 10 | Radioactive Chemical Elements and Radioactive Isotopes | 254,164 | Ferrous Waste and Scrap | 172,844 | -35.3 |

Source: Korea International Trade Association (KITA)

Table 8. Korea's Top 10 Exports to Ukraine
(at the 4-digit HS Code Level)

(Thousand USD)

| Rank | 2021 | | 2022 | | % Change (YoY) |
|------|--|---------|--|--------|----------------|
| | Goods | Value | Goods | Value | |
| 1 | Motor Vehicles | 135,481 | Motor Vehicles | 35,659 | -73.7 |
| 2 | Flat-rolled Products of Iron or Non-Alloy Steel (of a Width of 600 mm or more) | 67,658 | Motor Vehicles for the Transport of Goods | 28,073 | 698.3 |
| 3 | Cosmetics | 40,644 | Cosmetics | 25,431 | -37.4 |
| 4 | Parts and Accessories of Motor Vehicles | 32,745 | Flat-rolled Products of Iron or Non-alloy Steel (of a width of 600 mm or more) | 11,089 | -83.6 |
| 5 | Pneumatic Tires (of rubber) | 28,354 | Orthopedic Appliances | 9,023 | 3.2 |
| 6 | Self-propelled Bulldozers, Angledozers, Graders, etc. | 26,768 | Parts and Accessories of Motor Vehicles | 8,504 | -74 |
| 7 | Instruments and Appliances Used in Medical, Surgical, Dental, or Veterinary Sciences | 19,767 | Telephone Sets (including Smartphones) | 8,119 | 387.8 |
| 8 | Polymers of Propylene or of Other Olefins (in primary forms) | 17,367 | Pneumatic Tires (of rubber) | 8,080 | -71.5 |
| 9 | Human Blood; Animal Blood Therapeutic | 15,906 | Instruments and Appliances Used in Medical, Surgical, Dental, or Veterinary Sciences | 8,037 | -59.3 |
| 10 | Polymers of Ethylene | 13,578 | Human Blood; Animal Blood Therapeutic | 6,670 | -58.1 |

Source: Korea International Trade Association (KITA)

Table 9. Korea's Top 10 Imports from Ukraine
(at the 4-digital HS Code Level)

(Thousand USD)

| Rank | 2021 | | 2022 | | % Change (YoY) |
|------|---|--------|---|---------|----------------|
| | Goods | Value | Goods | Value | |
| 1 | Wheat and Meslin | 83,975 | Maize (Corn) | 505,096 | 754.8 |
| 2 | Maize (Corn) | 59,086 | Hydrogen, Rare Gases, and Other Non-Metals | 60,607 | 106.5 |
| 3 | Sunflower-Seed, Safflower, or Cotton-Seed Oil | 34,856 | Wheat and Meslin | 34,067 | -59.4 |
| 4 | Hydrogen, Rare Gases, and Other Non-Metals | 29,345 | Sunflower-Seed, Safflower, or Cotton-Seed Oil | 28,415 | -18.5 |
| 5 | Electric Instantaneous or Storage Water Heaters and Immersion Heaters | 17,941 | Electric Instantaneous or Storage Water Heaters and Immersion Heaters | 26,106 | 45.5 |
| 6 | Iron Ores and Concentrates | 12,414 | Titanium Ores and Concentrates | 8,790 | 20.6 |
| 7 | Wood | 11,237 | Ferro-Alloys | 5,263 | 659.8 |
| 8 | Ammonia, Anhydrous or in Aqueous Solution | 9,500 | Residues of Starch Manufacture and Similar Residues | 3,971 | 0.6 |
| 9 | Titanium Ores and Concentrates | 7,290 | Wood | 2,702 | -76 |
| 10 | Wadding of Textile Materials and Articles Thereof | 4,191 | Bran, Sharps, and Other Residues | 1,807 | - |

Source: Korea International Trade Association (KITA)

Endnotes

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