

Korea's Global Value Chain Strategies amid Rising Trade Disputes

Wonseok Choi Associate Research Fellow, Economic Security Team, International Trade, Investment and Economic Security Dept.
(wschoi@kiep.go.kr)

I. Introduction

Global economic governance that led to globalization and free trade in the early days of the post-Cold War era, is facing challenges amid China's rise and growing trade disputes. GATT and the WTO have accelerated their interdependence over the past 70 years, and more than 160 countries, which account for 98% of global trade, are now WTO members. Global tariffs have fallen by nearly 80%, and trade has more than doubled in the global economy.

However, challenges to the role of global governance such as the WTO are growing and globalization is receding amidst the expansion of great power competition and trade disputes, and the stance of technological nationalism and protectionism centered on the country is becoming more pronounced. Against this background, this article examined the characteristics of policies for stabilizing and reorganizing supply chains being pursued by major countries. In addition, it aims to present

relevant policy implications by identifying Korea's import dependence and cooperative countries targeting key supply chain items.

II. Supply Chain Reorganization Policies in Key Countries

Major countries such as the United States, the EU, and China have different policy directions in each field. Specifically, the overall policy stance of these countries has some similarities, such as the transition to a green industrial structure, improvement of domestic industrial competitiveness, and emphasis on secondary battery and semiconductor industries, but the policy directions are somewhat different. The US "Semiconductor and Science Act" and "IRA (Inflation Reduction Act)" show a policy stance to control the strengthening of the competitiveness of "country of concern" advanced semiconductor and secondary battery supply chains. The EU maintains an open trade stance

while partially agreeing with US policies by industry. According to the EU's "Semiconductor Act", the activation of "Priority Rated Orders (PRO)" during the crisis response process may act as an indirect export control and affect the global semiconductor supply chain, but the EU's competitiveness in the semiconductor market is specialized in manufacturing equipment, which is a durable material rather than core raw materials or materials, so it is assessed that the activation of the PRO is relatively unlikely to lead to a rapid shortage. However, there is a possibility that the EU's "Battery Act" will work against companies

that export goods from outside the EU over long distances, such as legalizing mandatory carbon footprint reporting and labeling for industrial batteries and fostering manufacturing industry.

Unlike the United States and the EU, China has not announced legislation to reorganize supply chains as a means of achieving economic security, but it is believed to be focusing on expanding supply chains by strengthening competitiveness and technological independence.

Table 1 Key Features of Supply Chain Reorganization Policies in major countries

	Semiconductor	Secondary Battery
USA	There is a guardrail clause prohibiting companies from constructing new semiconductor plants or expanding existing plants in the "country of concern" for 10 years for companies that have received subsidies	The amount of tax credit for eco-friendly cars with discriminatory factors is expected to be implemented on a larger scale, contrary to the Congressional Budget Office's estimate.
EU	Invoking PRO during the supply chain crisis response process is likely to affect the global semiconductor supply chain by acting as an indirect export control.	Mandatory carbon footprint declaration and labeling for electric vehicle (EV) batteries, batteries used in light mobile transportation (LMT) applications such as electric scooters and bicycles, and industrial rechargeable batteries with a capacity greater than 2 kWh
China	Differential support based on manufacturing technology: e.g., companies that have been engaged in semiconductor manufacturing (or process) for more than 15 years (or process) and produce semiconductors smaller than 28 nanometers will be exempted from corporate income tax for 10 years.	Establish battery modularity standards to strengthen supply chains for related industries; complete recycling systems and strengthen supply chain monitoring.

Source: Choi et al. (2023, forthcoming), Chapter 3.

As major countries are actively pursuing supply chain policies for various battery and secondary industries, the U.S. has released a "critical goods and materials" that includes secondary battery and semiconductor industries as part of the follow-up measures to the supply chain Administration Order, and it is expected to implement new policies that include supply chain management directions.

In particular, secondary batteries and semiconductors are the main export items, and for Korea, which is highly dependent on trade, it is important to look at the impact on the supply chain, focusing on these items. In the next section, we present promising cooperative countries, taking into account the country's global export competitiveness (measured by the "Trade Specialization Index"), as Korea's import dependence on semiconductors and secondary batteries among the "critical goods and materials" can be identified, and the vulnerability

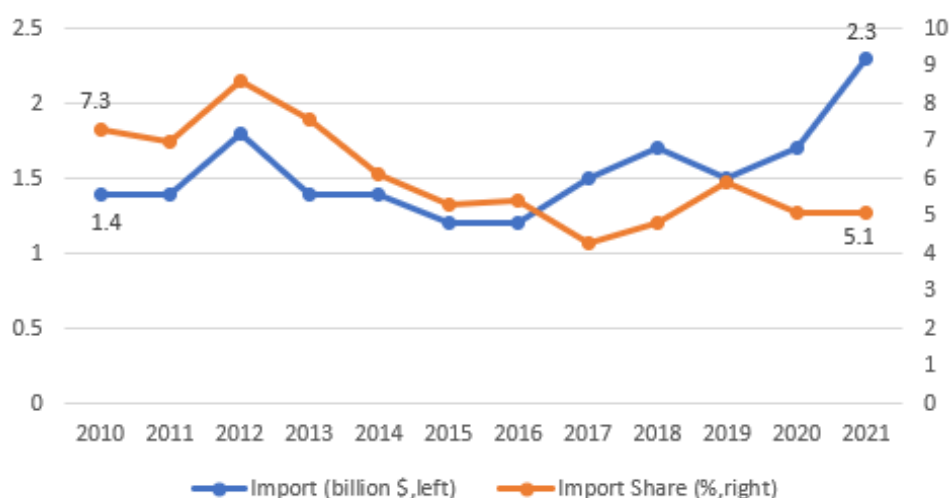
can be reduced as there is an import substitute country among the items with high import dependence of a particular country.

III. Analysis of Korea's Import Dependency for Semiconductors and Secondary Batteries

1. Semiconductors

Korea's total imports of semiconductor products did not increase significantly before 2016, but increased rapidly after 2017. Korea's imports of semiconductors increased significantly from \$19.1 billion in 2010 to \$44.8 billion in 2021. When looking at the share of Korea's semiconductor imports by use, semiconductor-related equipment imports generally account for the highest share, and Korea's semiconductor equipment imports account for 50.6% of total semiconductor imports in 2021.

Figure 1. Korea's Import Amount and Proportion of Semiconductor Items in "Critical Goods and Materials" (2010-2021)



Note: Import share refers to the import share of "critical goods and materials" in semiconductor imports.

In items linked to semiconductor production, Korea is shifting toward importing various countries and items. First of all, the number of countries from which Korea imports semiconductor-related items was 145 in 2010, but increased to 170 in 2021. The proportion of imports of a "critical goods and materials" in Korea's semiconductor imports is steadily increasing, increasing from \$1.4 billion in 2010 to \$2.3 billion. However, due to the increase in the total amount of semiconductor items imports, the proportion of imports of "critical goods and materials" decreased from 7.3% in 2010 to 5.1% in 2021.

It is noteworthy that four of the above items have a very high proportion of imports from a single country. Germany, Malaysia, Mexico, Italy, and Japan are among the countries with global export competitiveness for these items, so supply chain cooperation with these

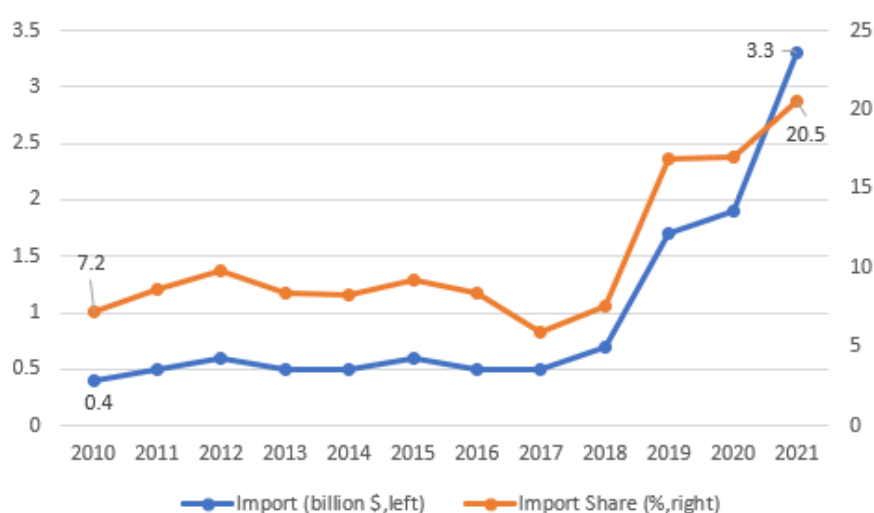
countries is expected to be necessary for Korea.

2. Secondary Batteries

First, the scale of Korea's imports of secondary batteries has been growing steadily and rapidly in recent years. Korea's imports of secondary battery products were worth \$5.6 billion in 2010, but grew to \$16 billion in 2021. In particular, Korea's import volume of secondary batteries has increased significantly since 2017.

Let's look at the trend of imports of secondary battery items in Korea by use. As of 2021, battery materials or parts accounted for 50.1% of Korea's total imports of secondary battery items, and battery equipment accounted for 49.9%. Korea imported secondary battery items from 112 countries in 2010 and secondary battery products from 139 countries in 2021.

Figure 2. Korea's Import Amount and Proportion of Secondary Battery Items in "critical goods and materials" (2010-2021)



Note: Import share refers to the import share of "critical goods and materials" in secondary battery imports.

Korea's imports of a "critical goods and materials" in secondary batteries have increased rapidly in recent years. Korea's imports of related secondary batteries grew from \$400 million in 2010 to \$3.3 billion in 2021, and their share also increased from 7.2% to 20.5% during the same period. The number of imported items related to "critical goods and materials" in Korea is also steadily increasing. Among these items, 11 items are highly dependent on imports, and the countries with global export competitiveness are analyzed as Japan, Mexico, and Vietnam, etc., so supply chain cooperation with these countries is expected to be important

IV. Policy Implications

Based on the above results, this article highlights several key points.

First, as discussed above, it is necessary to maintain continuous cooperation with various countries in order to maintain stable supply chains. Representative countries that have recently expanded their roles in the global supply chain are Asian countries Vietnam, Indonesia, India, Mexico, and Chile. As the role of these countries in the global supply chain expands, the Korean government must support the strengthening of cooperation with developing countries. In particular, developing countries have high demand for logistics and port-related investments to increase their linkages with global supply chains. The Korean government has experience in bilateral cooperation with various developing countries on port and logistics informatization and management, but there

are relatively few port and logistics construction and establishment projects in developing countries. The reason why there are few logistics-related international cooperation projects is that compared to the limited scale of ODA, logistics-related construction and development cooperation projects such as ports and roads require more funds than other projects. The Korean government plans to expand the scale of ODA, so it is expected that cooperation in infrastructure development to facilitate supply chains will become active in the future.

SSecond, as secondary batteries and semiconductors, account for a significant portion of Korea's exports, government-level support is needed to help related companies minimize the impact of major countries' economic security policies and build stable supply chains. To this end, Korea is currently seeking cooperation through government-level supply chain funds and various agreements with major countries. It is necessary to encourage companies to build supply chains that are eco-friendly and human rights based on excellent quality by understanding the need for economic security policies for members of society and continuously promoting support through social consensus. Korea should be imprinted from major countries around the world as a supplier of "premium intermediate goods" considering eco-friendliness and human rights. There are many ways to implement this supply chain strategy, but it is necessary to promote cooperation strategies that contribute to the economic growth of partner countries by establishing an ecosystem and expanding jobs.

Third Supply chain cooperation with countries with global export competitiveness is expected to become increasingly important among the "critical goods and materials" for which Korea relies heavily on imports from specific countries. Cooperation with advanced countries such as Germany, Italy, Japan, and the United

States is expected to become more important in the semiconductor supply chain. In addition, supply chain stabilization cooperation with countries such as Malaysia, Mexico, and Vietnam are expected to be necessary in the secondary battery supply chain. **KIEP**