

The Era of Great Transformation: Global Supply Chain Cooperation



Young-gui Kim

Ph.D., Senior Research Fellow, Policy Analysis Team
Center for International Development Cooperation

We are currently passing through a period of great transformation. Globalization is receding, and the rapid advancement of digitalization makes economic and social systems to be redesigned. Amid the ongoing global movement toward decarbonization following the Paris Agreement, non-economic values such as labor and the environment are gaining attention for sustainable development. These changes, through complex interactions, have been re-shaping global supply chains.

The first change is the rise of deglobalization and economic security. We are witnessing a massive wave of deglobalization that began with the 2008 global financial crisis. As globalization progressed in the 1990s, the golden era of international trade emerged. The establishment of the WTO brought order to the multilateral trading system and global value chains have deepened even further since China's accession to the WTO in 2001. However, after the global financial crisis in 2008, the growth gap between advanced and emerging economies widened. Within advanced economies, issues like income inequality and job losses have created political pressures, leading to the rise of so-called 'national protectionism.'

** The opinions, findings, conclusions, and recommendations expressed in this article are those of the author(s) and do not necessarily reflect the official policy or position of KIEP.*

The trade conflict between the U.S. and China has evolved into a hegemonic competition, and supply chain issues have become matters of economic security. Both the U.S. and China are forming alliances with their respective allies to secure an advantage over the other, resulting in the 'blocification' of supply chains.

The WTO system is currently not functioning effectively. The Doha Development Agenda (DDA) negotiations, which began in 2001, have stalled due to difference in positions between developed and developing countries while the trade environment has been rapidly changing. The WTO's Appellate Body has been non-functional since the end of 2019 due to a shortage of appellate judges. Meanwhile, major countries are pursuing unilateral trade policies aimed at protecting their domestic industries and reshaping supply chains, citing the national security exceptions under WTO rules.

The second change is the accelerated digital innovation. Digital innovation is rapidly advancing by integrating various emerging technologies that had developed independently, such as the Internet of Things (IoT), big data, artificial intelligence (AI), additive manufacturing, and robotics, into a single system. IoT connects each unit and related fields along the value chain, collecting big data, which is then analyzed in real-time by AI using machine learning techniques to derive optimal solutions. This innovation is bringing significant changes not only to production, services, and distribution but also to how we work.

Digital innovation affects supply chains through two channels. First, it is crucial to secure core technologies and related materials and components in order to accelerate digital innovation. For example, we must secure a supply chain for the production of AI semiconductors to lead digital innovation. Second, additive manufacturing and robotics, driven by digital innovation, are replacing labor with capital, reducing the influence of unskilled labor costs when selecting production locations. As a result, reshoring in developed countries is being promoted, while the participation of developing countries in the global supply chain is decreasing. The active use of additive manufacturing and robotics suggests that stable supply of components and large markets will play a more critical role in global supply chains than cheap labor.

We are living in an era where sustainable development is more important than ever. The most urgent issue for sustainable development is climate change. In 2015, the world agreed through the Paris Climate Agreement to limit the global average temperature rise to 1.5°C, with both developed and developing countries committed to addressing climate change.

Global supply chains are affected by climate change in two ways. First, to achieve carbon neutrality, monitoring carbon emissions and transitioning to low-carbon systems are required. To transform production methods and produce eco-friendly products, it is crucial to secure stable supply chains for essential items such as semiconductors, batteries, rare earth elements, and hydrogen. Second,

global supply chains are closely related to climate change due to carbon leakage. In 2021, the EU introduced the Carbon Border Adjustment Mechanism (CBAM) as part of the Fit for 55 Package. As a result, we can now expect the establishment of green supply chains that promote low-carbon transitions in production processes.

There is now growing interest in sustainable development beyond climate change, expanding into the ESG (Environmental, Social, and Governance). ESG refers to pursuing sustainability by considering non-financial factors, such as environmental impact, social responsibility, and corporate governance, and the risks and opportunities these present. The U.S.'s worker-centered trade policies and the EU's eco-friendly policies can be understood within the ESG framework. In the long term, global supply chains may be restructured reflecting the ESG values.

In the past, there were unavoidable supply chain disruptions due to factors such as natural disasters. However, today, there are growing concerns about policy interventions in supply chains for non-economic reasons, such as economic security, human rights, or environmental protection, aimed at protecting domestic industries and increasing control over supply chains.

We have already seen how artificial supply chain interventions can cause significant damage to both the country enforcing export restrictions and the affected counterparts. Examples of supply chain disruptions used by national policies include Japan's export restrictions against Korea and China's rare earth export restrictions against Japan.

In 2019, Japan removed Korea from its white-list and tightened export controls on three key materials essential for producing semiconductors and displays: high-purity hydrogen fluoride, fluorinated polyimide, and photoresists. This move was seen as retaliation for Korea's Supreme Court ruling. Japan's export restrictions lasted for nearly four years, until March 16, 2023. During this period, the Korea's government nurtured its materials and components industries, reducing dependence on Japan. Although diplomatic relations between the two countries have been restored, Japan's market share in Korea's imports has not recovered, causing losses for Japanese materials and equipment companies. Meanwhile, Korea incurred significant costs in the localization process, and some items saw increased dependence on Japan again after the relationship was mended.

In 2010, China restricted rare earth exports to Japan during a territorial dispute over the Senkaku Islands or Diaoyudao. Rare earth elements are crucial for the production of advanced technology products and China was a dominant player in global rare earth production. Japan filed a complaint with the WTO and developed its own rare earth production and recycling technologies, while diversifying its import sources to countries like India and Brazil. As a result, Chinese companies suffered considerable losses. However, since Chinese rare earth products still hold a competitive edge, Japan continues to incur additional costs in the process of restructuring its rare earth supply chains.

Also many previous studies on global supply chain fragmentation suggest that friend-shoring will likely lead to a decrease in overall welfare.

Throughout human history, cycles of division and cooperation have repeated. After experiencing the devastation of World Wars I and II, countries realized that conflict and division were not beneficial to anyone. As a result, numerous international organizations were established, ushering in an era of international cooperation. However, we now sense that many things are changing. I would describe the current era in one word: the age of distrust. A lack of trust is driving countries to form stable relationships with like-minded countries, a process that seeks to achieve economic security.

Now new opportunities and challenges lie in front of us. The changes we face are difficult to address without international collaboration. While it may seem that globalization is regressing, global inter-connectivity remains high. In this context, complex crises affecting both supply and demand are amplified through global inter-connectedness, with negative impacts magnified as a result.

Therefore, international cooperation and solidarity are more critical than ever. We must continue to make efforts toward international cooperation, grounded in universal human values and principles, openness, and inclusiveness.

First, we can begin by cooperating on universally accepted human values and principles, as well as on global issues that require collective international responses. Where necessary, we can also pursue multi-layered cooperation on specific issues.

Additionally, cooperation must be open. In an interconnected world, national prioritization is not a viable solution. Rather, diversification based on openness is essential to enhance the resilience of global supply chains.

Above all, inclusiveness must be prioritized. Behind the push for deglobalization lies a recognition that serious polarization and inequality have resulted from globalization. While technological advancements and digital transformation will bring a better future, they also risk widening the gap between countries and deepening polarization. We must explore new directions for international cooperation to ensure that these changes provide opportunities for all of us. **KIEP**