

# Shift in Central Asia's Global Value Chains after the Ukraine War and Policy Implications for Korea-Central Asia Economic Cooperation

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## I. Introduction

This report rigorously analyzes the structural shifts in Central Asia's global value chains (GVCs) following the Russia-Ukraine war and derives new directions for economic cooperation between Korea and Central Asia. As unprecedented Western economic sanctions against Russia have persisted and are likely to remain in place for an extended period, it is essential to examine how these sanctions structurally affect Central Asia's GVC participation.

Central Asian economies are currently mobilizing national efforts to strengthen export competitiveness in pursuit of stable economic growth. Reflecting this, the study focuses on the export side of Central Asian trade and identifies how sanctions on Russia have reshaped the region's trade structure. At the

same time, in a global environment marked by deepening trade fragmentation, raising the quality of Korea-Central Asia economic cooperation requires cooperation strategies that explicitly take into account how sanctions are altering Central Asia's GVC linkages.

Accordingly, the report pursues two main objectives. First, it provides an econometrically rigorous analysis of the structural changes in Central Asia's GVCs since the Russia-Ukraine war, treating major geopolitical shocks as external shocks to the region's trade structure. Second, based on these analytical findings, it proposes a new strategic direction for Korea-Central Asia economic cooperation that responds to the altered trade environment and supports Central Asia's long-term growth and industrial upgrading.

## II. Shifts in Central Asia's Global Value Chains after the Ukraine War

Using Eora's multi-region input–output (MRIO) database, the report decomposes the value added embodied in Central Asian exports between 2010 and 2022. This allows the authors to identify, in quantitative terms, which partner countries' value added is being used in which industries across the five Central Asian economies. The analysis highlights both common patterns and country-specific differences regarding: (i) the share of foreign value added (FVA) in total exports, (ii) the sectoral composition of FVA in exports, and (iii) changes over time in FVA embedded in total exports.

First, after the 2014 Crimea crisis, the share of FVA in exports increased in Kazakhstan and Uzbekistan, whereas it declined in the other Central Asian countries. Second, in terms of sectoral patterns, Kazakhstan and Uzbekistan rely most heavily on FVA in manufacturing exports, while Kyrgyzstan and Tajikistan utilize FVA more intensively in service exports rather than manufacturing. A particularly important finding is that, in Kazakhstan and Uzbekistan as well, the share of FVA in manufacturing exports has declined since the Crimea crisis, mirroring the pattern observed in the other three Central Asian economies. Third, for all five countries, the relative importance of Russia as a supplier of value added in their exports has weakened since around 2016.

Taken together, these results suggest that the 2014 Crimea crisis functioned as an external shock that triggered structural changes in Central Asia's export structure and GVC integration. By contrast, at least in quantitative terms, the short-term impact of the 2022 Russia–Ukraine war on Central Asia's export structure is not yet clearly visible in the available data, which extend only through 2022. However, the post-2014 experience indicates that structural changes can materialize with a time lag: significant shifts in Central Asia's export structure began to appear not in 2014 but from 2016 onward. It is therefore highly plausible that the 2022 war, like the Crimea crisis, will exert long-lasting and gradually unfolding effects on Central Asia's GVC participation, particularly in manufacturing, as sanctions on Russia persist.

## III. The Impact of External Shocks on Central Asia's Participation in Global Value Chains

### 1. Analytical Approach and Data

Chapter 3 examines how Western economic sanctions against Russia have affected Central Asia's export structure, treating the sanctions as a proxy for the external shock generated by the Russia–Ukraine war. This approach reflects the still-high degree of economic interdependence between Central Asia and Russia and the central role Russia has traditionally played in the region's trade networks.

The empirical analysis uses bilateral export data for the five Central Asian countries covering 2011–2022, disaggregated into 26 industrial categories and 190 trading partners. Total exports are divided into intermediate and final goods to allow separate estimation of sanctions' effects on each segment. In addition, the 190 partner countries are split into 35 sanction-participating countries and 155 non-participating countries, enabling a more detailed assessment of how sanctions alter Central Asia's pattern of GVC integration across different groups of partners.

## 2. Differential Effects on Intermediate and Final Goods

The first major finding is that sanctions have had markedly different effects on intermediate and final goods exports. Following the introduction of sanctions after the 2014 Crimea crisis, Central Asia's exports of intermediate goods declined up to 2016. They then rebounded sharply until 2018, before their growth momentum weakened again.

In contrast, final goods exports did not show a pronounced decline around 2014. Instead, they increased steadily from 2015 onward, with the pace of growth moderating somewhat after 2019. This divergence implies that sanctions on Russia have exerted a much stronger and more disruptive impact on Central Asia's upstream participation in GVCs via intermediate goods than on downstream exports of final goods.

## 3. Partner Reorientation and Manufacturing GVC Participation

The second key finding concerns the reorientation of trade partners. Intermediate goods exports from the five Central Asian economies to sanction-participating countries continued to fall after 2015, whereas intermediate goods exports to non-participating countries recovered rapidly. This pattern suggests a change in the way Central Asia participates in GVCs: intermediate goods that had previously been exported to countries actively enforcing sanctions on Russia were redirected toward countries not participating in the sanctions regime.

In manufacturing, this reorientation is particularly pronounced. Since 2014, manufacturing intermediate goods exports have become increasingly concentrated in non-participating countries, indicating a deepening partner concentration and a growing dependence on a narrower set of markets outside the sanctioning bloc.

## 4. Constraints on Manufacturing-Led GVC Integration

A third finding is that sanctions on Russia significantly reduced Central Asia's intermediate goods exports even when exports to Russia and Ukraine themselves are excluded. Additional sanctions episodes are estimated to have lowered manufacturing intermediate goods exports from the five Central Asian countries by roughly 10–20 percent.

This result gives quantitative backing to the concern that sanctions on Russia can restrict Central Asia’s manufacturing-based GVC participation. As long as sanctions persist, they are likely to continue constraining the region’s ability to upgrade into higher value-added segments of manufacturing value chains, both upstream and downstream, unless alternative cooperation frameworks with new partners, including Korea, are actively developed.

## IV. Future Directions for Korea-Central Asia Economic Cooperation

### 1. Cooperation Principles

Synthesizing the findings from Chapters 2 and 3, the report argues that the 2022 Russia–Ukraine war is functioning as a negative external shock that delays Central Asia’s integration into GVCs in both upstream and downstream segments, particularly in manufacturing, as long as sanctions against Russia continue. Although Korea–Central Asia trade volumes have grown substantially in quantitative terms, Korea’s contribution to the value added embodied in Central Asian exports remains extremely limited.

In this context, Korea and Central Asia must move beyond the conventional pattern in which Korea imports raw materials from the region and exports finished goods back to it. New cooperation strategies should: (i) support Central Asia’s efforts to expand exports and strengthen manufacturing, (ii) increase the value added of

Central Asia’s manufacturing exports, and (iii) help Central Asia upgrade its abundant mineral resources into higher value-added products while stabilizing Korea’s supply chains for critical resources. The overarching principle is to promote local production and joint value creation in promising sectors where Korea’s comparative advantages and Central Asia’s development needs align.

### 2. Sectoral Cooperation in Manufacturing

Automobiles and auto parts are high value-added manufacturing sectors in which cooperation with the more industrially advanced Central Asian economies—particularly Kazakhstan and Uzbekistan—is promising. These countries have relatively better industrial infrastructure, financial sectors, institutional frameworks, and manufacturing bases, and their governments are actively promoting automotive industry development and local production bases.

Since the Russia–Ukraine war, Central Asia’s dependence on Russian automobile and parts imports has declined, while imports from countries such as China, Japan, and Korea have increased. Korean firms have begun expanding local assembly and production capacity, especially in Kazakhstan, and Uzbekistan remains the largest automobile producer and market in Central Asia, with growing exports of domestically produced parts.

At the same time, competition from low-cost

Chinese internal-combustion vehicles and electric vehicles is intensifying. Korea therefore needs a dual strategy: (i) strengthen localization of parts and final vehicles through direct investment and joint ventures, focusing on affordable models that can be exported to neighboring lower-income markets, and (ii) leverage tariff advantages such as Eurasian Economic Union (EAEU) preferences and the EU's GSP+ scheme—under which Kyrgyzstan and Uzbekistan already enjoy duty-free access for many products—to maximize the benefits of local production for regional export expansion. This approach simultaneously enhances Central Asia's value added in automotive exports and opens up new growth opportunities for Korean firms.

**E**lectronics is another high value-added manufacturing sector that requires large, long-term investments and advanced technology. Here, cooperation with Kazakhstan and Uzbekistan is again particularly relevant. Following the Russia–Ukraine war, both countries have intensified policies to foster manufacturing, including electronics, and actively seek foreign investment, positioning the war-induced reshuffling of global production networks as an opportunity for industrial upgrading.

**H**owever, the domestic markets in both countries are relatively small, purchasing power is limited, and Chinese electronics products already hold a dominant share. Rather than competing head-on in the low-price mass market, Korea should focus on: (i) premium final products where it has strong technological and

brand advantages, and (ii) electronic components and intermediate goods where Korean firms maintain a clear technological lead. By building local ecosystems for the production of higher-end electronics and key components, Korea can help Kazakhstan and Uzbekistan develop manufacturing capabilities while maintaining competitiveness against Chinese products.

**E**nergy plant cooperation is particularly promising with Turkmenistan, which holds large reserves of natural gas and aims to add value by expanding hydrocarbon processing and petrochemical industries. Since the Russia–Ukraine war, Turkmenistan has prioritized facilities for oil and gas processing, refining, petrochemicals, and related energy plants. The Korean government, for its part, has designated plant industries as one of its key export sectors and actively supports overseas plant orders, creating a strong basis for complementary cooperation.

**Y**et Turkmenistan's high degree of market closure, limited transparency, and centralized decision-making—where final authority over major state-owned energy firms rests effectively with the president—pose significant challenges for private firms acting alone. To make large-scale, long-term energy plant projects feasible, government-to-government cooperation is essential. This includes: (i) establishing structured cooperation programs that reflect the needs of both sides, (ii) institutionalizing high-level dialogues and memoranda of understanding focused on energy plants, and (iii) developing risk-sharing mechanisms such as partial

guarantees and insurance in cooperation with financial institutions, alongside improved information sharing and support for business networking.

Cooperation in light industry—especially food processing and textiles—is promising with lower-income Central Asian economies such as Kyrgyzstan and Tajikistan, where industrial infrastructure is relatively weak but labor is abundant and remittances from migrant workers remain important. Agriculture and cotton-based production are already central industries, and both countries seek to increase value added by moving from raw exports to processed food and textile products. Kyrgyzstan and Tajikistan are promoting industrial clusters, the introduction of modern technologies, human resource development, and improvements to logistics infrastructure. These policies provide opportunities for Korean firms in areas such as investment in processing facilities, exports of textile machinery, and cooperation on technology transfer and workforce training.

Korea's favorable country image and the popularity of Korean culture in Central Asia can be leveraged to differentiate Korean food and clothing products, focusing on health-oriented foods and fashion items that reflect Korean cultural trends and can be produced locally. For Kyrgyzstan in particular, membership in the EAEU allows food and clothing produced domestically to be exported to markets such as Kazakhstan and Russia under favorable tariff conditions, magnifying the benefits of local production. Given the relatively weak logistics

infrastructure in these countries, cooperation to improve customs procedures and digitalize logistics networks—closely linked with official development assistance (ODA) programs—is a necessary complement to industrial cooperation in light industry.

### 3. Critical Minerals and Strategic Supply Chains

Critical minerals constitute another key area for Korea–Central Asia cooperation. Central Asia holds substantial reserves of minerals that Korea has designated as strategic, including uranium, copper, anthracite, nickel, manganese, chromium, lead, and zinc, and countries such as Uzbekistan and Kyrgyzstan are actively pursuing lithium development. Since the Russia–Ukraine war, Central Asian governments have elevated energy and resource security within their national development strategies, adopted related legislation, and sought to improve their investment environments in order to accelerate exploration and development of critical minerals.

At the same time, the region's weak international logistics, high corruption levels, and strong influence of third-country actors complicate cooperation. All five Central Asian countries are landlocked, and their transport and logistics infrastructure remains underdeveloped, making local processing and upgrading of minerals particularly important. By promoting in-country refining and processing, Korea can help Central Asia overcome high logistics costs, increase value added, and develop mineral-

based industries, while also diversifying Korea's own supply of critical raw materials and intermediate inputs.

Promising instruments include joint research centers and technology cooperation platforms that support exploration, refining, and advanced materials development tailored to local geological and industrial conditions. In parallel, improving logistics—through infrastructure investment, public-private partnership (PPP) projects, and digitalization of transport and customs systems, often with ODA support—will be essential to make mineral-based value chains both commercially viable and developmentally beneficial. Governance challenges, including corruption and rent-seeking by political elites, further underscore the need for stable intergovernmental channels and risk-sharing arrangements for private investors.

## V. Policy Implications

The analysis shows that Western economic sanctions against Russia are functioning as a negative external shock that delays Central Asia's participation in GVCs on both the upstream and downstream sides, with particularly pronounced adverse effects in manufacturing. At the same time, all five Central Asian economies urgently seek to diversify into higher value-added industries and enhance the export competitiveness of their manufacturing sectors. The Russia-Ukraine war has also accelerated the fragmentation of international production networks and heightened the strategic importance of critical minerals abundantly found

in Central Asia, while Korea remains heavily import-dependent and faces limits to meeting its needs through recycling alone.

Against this backdrop, and in light of the still modest scale and value added of existing cooperation, Korea-Central Asia resource and manufacturing cooperation—especially in critical minerals—takes on renewed strategic significance. The report's proposals for cooperation in automobiles and auto parts, electronics, energy plants, light industry, and critical minerals share a common principle: shifting from a model centered on raw material imports and final-goods exports toward local production and co-creation of high value added in Central Asia. This approach directly supports Central Asia's industrial transformation and export competitiveness while strengthening the resilience of Korea's supply chains. For this transformation to be sustainable, several macro-level policy directions are essential.

### 1. Incentive-Compatible Technology and Knowledge Transfer

Localizing production in Central Asia necessarily entails the formation of new industrial ecosystems and greater participation by local firms. To make this feasible, Korean companies must transfer an appropriate level of production technology and practical know-how, without undermining their own core competitiveness. The government should therefore design economic incentives and institutional support mechanisms that encourage FDI accompanied by technology transfer in selected

sectors and technologies. As many developing countries, including those in Central Asia, already provide preferential treatment for such investment, the Korean government should actively negotiate additional benefits for Korean investors, emphasizing that upgrading manufacturing in the prioritized cooperation sectors is directly linked to Central Asia's long-term growth agendas.

## 2. Human Capital, Technical Education, and Entrepreneurship

High value-added manufacturing sectors such as automobiles and electronics require complex, sophisticated industrial ecosystems and, in the long run, active participation by local private firms. This calls for both improvements in the institutional environment for entrepreneurship and a significant expansion of skilled human capital. Korea should promote the overseas expansion of its technical education and start-up support institutions, and expand student, expert, and vocational training exchanges to nurture the next generation of entrepreneurs and engineers in Central Asia.

## 3. Financial Sector Development and Risk-Sharing Mechanisms

Manufacturing and large-scale resource projects require substantial capital investment, making the development of local financial systems critical for mobilizing private investment and diversifying risk. Korea can share its experience with credit-guarantee schemes and

SME finance, encourage Korean financial institutions to enter Central Asian markets, and help establish platforms for regular policy dialogue on financial sector development. A more advanced financial system will improve allocative efficiency across the economy and support the growth of productive firms engaged in joint Korea–Central Asia value chains.

## 4. Logistics Infrastructure and Connectivity

As all five Central Asian countries are landlocked and their customs and transport infrastructure remain underdeveloped, logistics costs are structurally high. For high value-added manufactured goods, exports may still be feasible despite these costs, but for light industry products and bulk minerals, lowering logistics costs through infrastructure improvement becomes an indispensable condition for expanded cooperation. In the short term, Korea and Central Asia should prioritize the efficiency gains obtainable from customs modernization and digitalization of logistics networks, leveraging ODA where appropriate. In the medium to long term, sustained intergovernmental cooperation will be needed to support the expansion and upgrading of regional transport networks. Given past negative experiences by Korean firms in infrastructure projects, it is particularly important to maintain close, transparent communication between governments to prevent similar problems in the future and to design PPP frameworks that attract private participation while sharing risks

fairly.

## 5. Governance, Contract Enforcement, and Anti-Corruption

Finally, the unpredictable nature of corruption and rent-seeking—especially in sectors such as natural resource exploration, extraction, and development—poses a serious obstacle to long-term cooperation. Large, immobile, and capital-intensive investments are especially sensitive to contract risk. Korea and Central Asian governments should therefore establish and maintain robust, standing channels for dialogue, mediation, and problem-solving to ensure credible commitment to contract enforcement. Providing partial government guarantees for private projects in areas such as infrastructure and mineral development can help distribute risk more effectively and encourage sustained private participation.

By combining sector-specific cooperation in manufacturing and critical minerals with these broader policy measures, Korea and Central Asia can build a new, more resilient cooperation framework that both supports Central Asia's structural transformation and enhances Korea's economic security in an era of heightened geopolitical risk and fragmented global value chains. **KIEP**