The Impact of Unilateral Trade Policy on International Trade Structure

Moonhee Cho Research Fellow, Trade Agreement Team, Department of International Trade (mhcho@kiep.go.kr)
Chankwon Bae Research Fellow, Department of International Trade (ckbae@kiep.go.kr)
Kyu Yub Lee Research Fellow, New Trade Strategy Team, Department of International Trade (kylee@kiep.go.kr)
Jungu Kang Principal Researcher, Trade Agreement Team, Department of International Trade (jgkang@kiep.go.kr)
Ji Hyeon KIM Researcher, New Trade Strategy Team, Department of International Trade (jihyeon@kiep.go.kr)

I. Introduction

Uncertainty grows with the diffusion of unilateral trade policies. In particular, the average value of the World Uncertainty Index increased by four to fivefold compared to 1990.

Unlike protectionism, unilateral trade policies are diverse in measures and unilaterally imposed on partner countries, hence increasing uncertainty in the international trade environment. In the case of the United States, anti-dumping and countervailing duties have been actively used and higher rates growingly imposed after the Trade Preference Extension Act of 2015 came into force. Unilateral trade policies are spreading internationally. Non-tariff measures including anti-dumping, countervailing measures, SPS and TBT are increasing. Moreover, both developing and developed countries are adopting trade-disruptive measures and these are rapidly increasing.

Figure 1. World Uncertainty Index
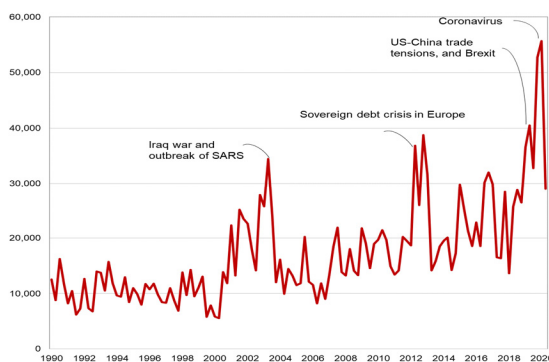
Source: Ahir, H., N. Bloom, and D. Furceri (2018), "World Uncertainty Index", https://www.policyuncertainty.com/wui_quarterly.html

Figure 2. World Trade Uncertainty Index

Source: Ahir, H., N. Bloom, and D. Furceri (2018), "World Uncertainty Index", https://www.policyuncertainty.com/wui_quarterly.htm

KIEP Korea Institute for International Economic Policy

II. Change in Trade Structure

The rise of free trade agreements and expansion of GVCs, among other factors, has led a rapid increase in international trade. Nevertheless, trade has been slowing down after the global financial crisis (GFC). Between 1995 and 2007, the trade growth rate was on average 9% per year; after the GFC, it slowed to around 4% per year. The trend can also be found among developed and developing countries. While intermediate goods grew by 19% on average per year from 2002 to 2007, this growth slowed to 2% on average per year from 2010 to 2019. GVCs are being reorganized as developing countries become consumer markets, the technology gap between developed and developing countries diminish and the development of digital technology decreases developing countries' labor cost competitiveness.

**Figure 3. The Change in Import Market Share in North America (2015-2019) (%)**
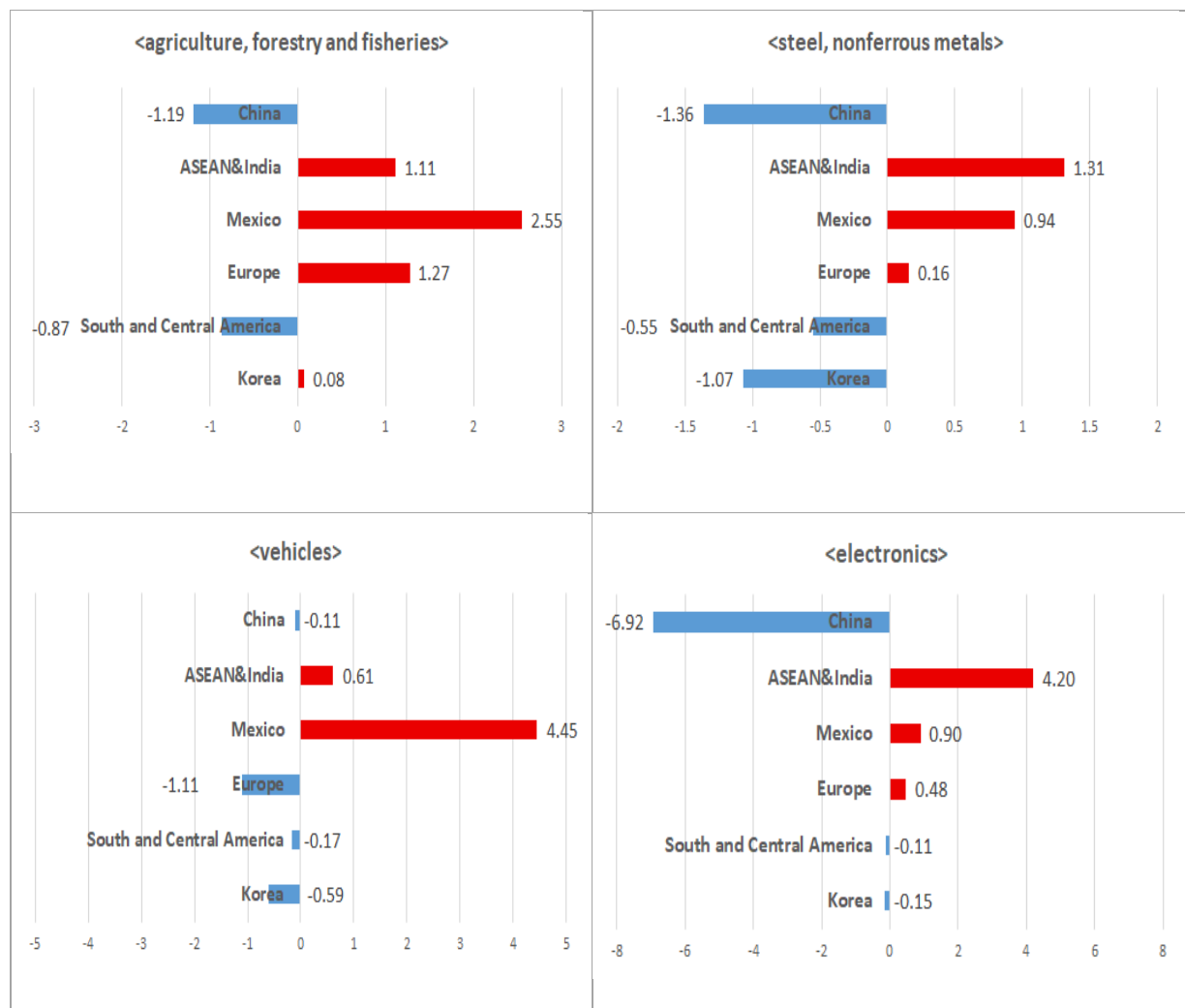
Source: By author

The change in import market shares for the United States and China clearly reflects the trade disputes between the two. China's market share in the North American import market decreased across all sectors, whereas ASEAN and India's share increased across all sectors excluding mining. However, China still accounts for a large portion of North America's market in manufacturing sectors including electronics.

North America's share in China's import market also decreased across all sectors. In particular, its share decreased around 12% in the agriculture, forestry and fisheries sector, around 10% in the vehicles sector and around 5% in the steel, nonferrous metals sector.

Figure 4. The Change in Import Market Share in China (2015-2019) (%)
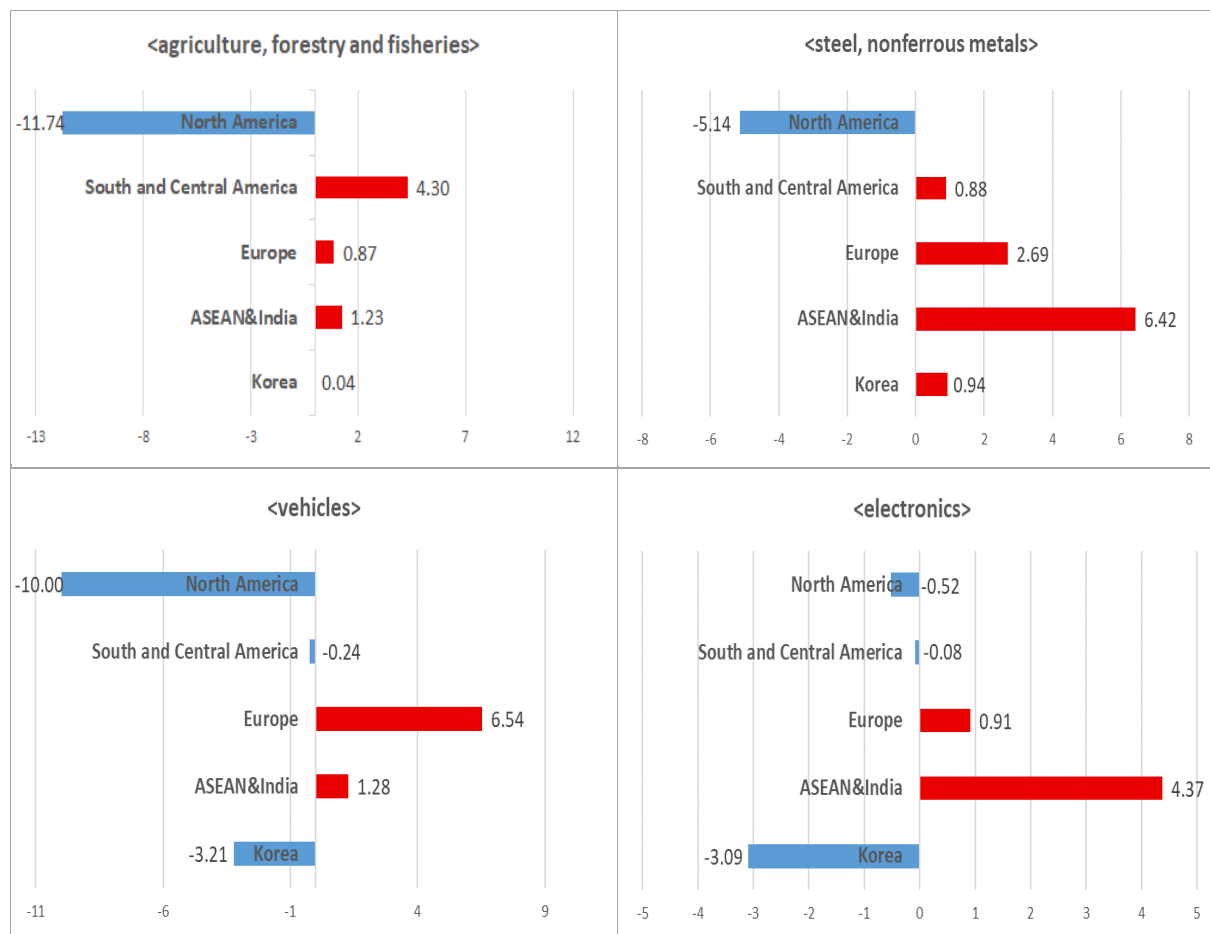
Source: By author

U.S. imports from the world showed an overall increase except in 2015 and 2016, but recorded about $2.5 trillion in 2019, a decrease of about 1.7% compared to the previous year. However, the share of U.S. imports in global imports increased from 12.9% in 2018 to 13.2% in 2019. The share of the U.S. in the global import market before 2015 was around 12%, but after

2015, it has recorded around 13%. U.S. imports from China increased sharply after 2010, but declined sharply in 2019. In particular, imports from China recorded about 450 billion dollars in 2019, down 16.2% from the previous year. China's share of the U.S. import market also decreased from 21.3% in 2018 to 18.1% in 2019. While it cannot be confirmed that the U.S. imports from the world have decreased due to the recent unilateral trade policy of the U.S., it is believed that a decrease in imports from China has occurred to some extent.

The effects of the U.S. government's trade policy on the domestic economy and industry depend on whether the U.S. tariffs on China have had a trade diversion effects. Also, the impact on neighboring countries will be different. If the trade diversion effect is big, it is hard to expect improvement in United States' trade balance, and the effect of protecting domestic industries and creating jobs would be weak. According to our analysis, based on Romalis (2007) and Russ and Swenson (2019), the trade diversion effect in the United States' import market is statistically significant, especially for intermediate goods.

III. Counterfactual Analysis

Over the last decade, the world's GVC participation has stagnated (Figure 5). We examine the impact of unilateral trade policies on international trade structure including consumption goods, intermediate goods, value-added export, and GVC indices. The key question is how the rise in trade costs due to the proliferation of unilateral trade policies affects the trade structure of the world, regions and that between countries. To do this, we modify a quantitative trade model with GVC by Antras and Chor (2018) and use the ADB MRIO database released in 2020.

Figure 5. World GVC Participation
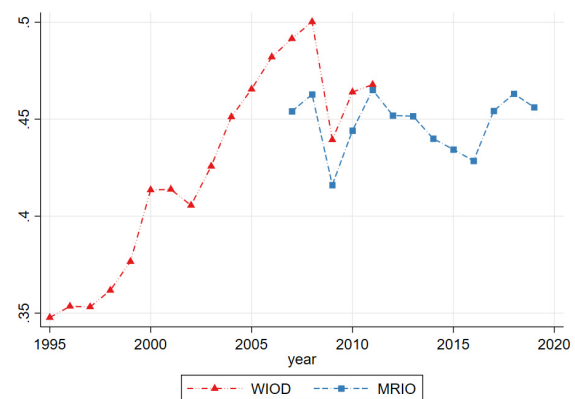
Source: Author's calculation by using WIOD (1995–2007) and ADB MRIO (2007–19)

1. The Model and Data

Consider a world economy comprising J countries and S sectors. Denote country and sector as $i, j \in \{1, 2, \ldots, J\}$ and $r, s \in \{1, 2, \ldots, S\}$, respectively. In addition, we notate final goods, intermediate input, gross output, value-added as F, Z, Y, and VA. We use subscript ij as exporting country and importing country. Superscript rs indicates seller and buyer, respectively. The representative consumer in country j consumes composite goods and maximizes her Cobb-Douglas utility function. Final and intermediate goods producers maximize profits in all countries. Labor is immobile across countries.

For given exogenous variables, a trade equilibrium can be described by sector-level bilateral expenditure shares in final and intermediate goods, sector-level usages of intermediate and final goods, aggregate income levels, etc. In order to analyze the consequences of such counterfactual changes, we can use exact hat algebra. For example, $\hat{x}$ means x'/x and other exogenous variables are defined in the same way. The system describing the counterfactual equilibrium can be represented as follows.

Changes in sector-level unit costs with wage w and price index p

$$\hat{c}_j^s = \hat{w}_j^{1-\sum_{r=1}^{s} \gamma_j^{rs}} \prod_{r=1}^{s}(\hat{p}_j^r)^{\gamma_j^{rs}}$$

Changes in sector-level price indices of intermediate goods and final goods

$$\hat{p}_j^{rs} = \left[\sum_i^J \pi_{ij}^{rs} \left(\hat{c}_i^r \hat{\psi}_{ij} \hat{d}_{ij} \frac{1 + (\tau_{ij}^{rs})' + (\zeta_{ij}^{rs})'}{1 + \tau_{ij}^{rs} + \zeta_{ij}^{rs}} \right)^{-\theta^r} \right]^{-\frac{1}{\theta^r}}.$$

$$\hat{p}_j^{rF} = \left[\sum_i^J \pi_{ij}^{rF} \left(\hat{c}_i^r \hat{\psi}_{ij} \hat{d}_{ij} \frac{1 + (\tau_{ij}^{rF})' + (\zeta_{ij}^{F})'}{1 + \tau_{ij}^{rF} + \zeta_{ij}^{F}} \right)^{-\theta^r} \right]^{-\frac{1}{\theta^r}}.$$

where ψ, d, τ, and ζ are unexpected trade costs, traditional trade costs, tariff, and nontariff related trade costs, respectively.

Changes in bilateral trade share of intermediate goods and final goods

$$\hat{\pi}_{ij}^{rs} = \left(\frac{\hat{c}_i^r \hat{\psi}_{ij} \hat{d}_{ij}(1 + \hat{\tau}_{ij}^{rs} \tau_{ij}^{rs} + \hat{\zeta}_{ij}^{rs} \zeta_{ij}^{rs})}{\hat{p}_j^{rs}(1 + \tau_{ij}^{rs} + \zeta_{ij}^{rs})} \right).$$

$$\hat{\pi}_{ij}^{F} = \left(\frac{\hat{c}_i^r \hat{\psi}_{ij} \hat{d}_{ij}(1 + \hat{\tau}_{ij}^{rF} \tau_{ij}^{rF} + \hat{\zeta}_{ij}^{rF} \zeta_{ij}^{F})}{\hat{p}_j^{rF}(1 + \tau_{ij}^{rF} + \zeta_{ij}^{F})} \right).$$

Changes in usage of intermediate goods and final goods

$$\left(Z_{ij}^{rs} \right)' = \left(\pi_{ij}^{rs} \right)'^{\gamma_j^{rs}} \left(Y_j^s \right)'.$$

$$\left(F_{ij}^r \right)' = \left(\pi_{ij}^{rF} \right)'^{\alpha_j^r} [\Sigma (VA_j^r)' + R_j + D_j].$$

Where R is tariff revenue and D is trade deficit. Market clearing conditions and world trade balance should be satisfied in equilibrium.

All trade and input-output data used in our quantitative analysis are from the ADB MRIO for the year 2019, which is the most recent dataset available. To generate an exogenous shock for the change in trade cost, we estimate tariff equivalent (Cadot and Gourdon 2014, Handley et al. 2020) by using the Trade Uncertainty Index as a proxy for unilateral trade policies. The calculated tariff equivalent induced by Trade Uncertainty Index is about 10.21%.

2. Main Results

If trade cost rises due to shocks from the United States, the share of total exports and intermediate exports out of the world's total production both decrease. Most of the decrease can be attributed to change in total and intermediate exports of the three North American countries (United States, Mexico, Canada). Meanwhile, the share of value-added exports out of total exports increases. This is due to the increase of North American countries' share of value-added exports unlike that of other

countries such as Korea, China and Japan, European countries and so on. GVC indices also changed for those three countries, and in particular the United States' GVC participation rate increases.

The global shock due to unilateral trade policies is stronger than shocks from the United States and has different ramifications. All regions experience a decrease in their share of consumption goods and intermediate goods' exports and the majority of countries and regions see a drop in value-added exports' share. In conclusion, the GVC participation rate of the world declines. This means that the proliferation of unilateral trade policies works against the decades-long past trend of GVC expansion, and intensifies rearrangement of GVCs, negatively affecting total, intermediate and value-added export structures.

Table 1. Unilateral Trade Policy and Changes in International Trade Structure

	2019	US Shock	Global Shock
Share of total export	13.5	12.8	9.3
Share of intermediate goods export	8.5	8.1	5.6
Domestic Value-added	80.9	81.0	85.6
Value-added export	70.8	71.0	77.3
GVC participation	50.1	51.2	40.2

Notes: Share of total export (intermediate goods export) is total volume of world export (intermediate goods export) divided by world output.
Source: Author's calculation

IV. Concluding Remarks

A slowdown in global trade is inevitable for now because the global economy is unlikely to recover in a short period of time due to the prolonged COVID-19 crisis, and the U.S.-China trade conflicts may intensify. As we have seen so far, as uncertainty in the trade environment deepens due to the international spread of unilateral trade policy, it is expected to bring about many changes in international trade structure, including reorganization of the global value chain. Accordingly, the following policy implications are presented.

We need to strengthen our ability to respond to GVC rearrangements. Efforts to build a less efficient but more secure global supply chain must follow. We need to note that countries around the world have experienced high dependence on Asian countries for health-related products and medical equipment after the COVID-19 outbreak. Developing countries as well as developed countries are highly likely to consider not only efficiency improvement but also stability enhancement when building global supply chains. For stable supply chain management, the global supply chain should be diversified. At the same time, in the case of

core materials, parts, and equipment industries, reshoring policies should be considered.

As protectionism spreads around the world, it is also important for firms to improve price competitiveness, reduce trade costs, and prepare for digital transformation. If each country strengthens protectionist policies, it will be difficult for domestic firms to maintain their existing production levels and export performance. When global demand shrinks, high price competitiveness is required to survive in the global market. In addition, the increase of tariff and non-tariff measures, such as retaliatory tariffs, quarantine enhancement, and raw material export restrictions, all raise trade costs for firms. Since there is a limit to preparing at the national level for all situations, efforts to lower trade costs at firm level are necessary. Moreover, as the COVID-19 pandemic continues, the demand for digital services will expand even further, and digital services such as data technology, software, and design can become a mainstay in the formation of a new value chain. Therefore, firms also should actively prepare for digital transformation.

Korea should continue its efforts to sign new free trade agreements and upgrade their contents. As Korea is highly dependent on trade with the U.S. and China and its exports are concentrated on a small number of items, growing uncertainty in the global economy is a great threat. Therefore, Korea needs to diversify its trading partners. Towards this, the aim should be to sign free trade agreements with emerging countries with large consumer markets and high potential. Also, trade negotiations with emerging and developing countries require a differentiated negotiation strategy. Since these countries are interested in economic cooperation with Korea and investment by Korean companies, it is necessary to develop a new type of free trade agreement that reflects this. Lastly, low-level FTAs need to be upgraded as soon as possible. KIEP