The Role of the Manufacturing Competitiveness in the COVID-19 Recovery in Korea

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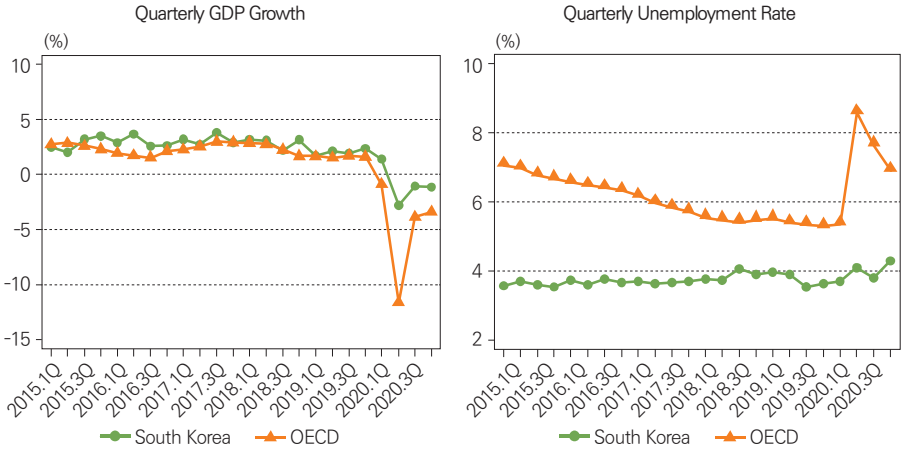
1. Introduction

The global impact of the COVID-19 pandemic was devastating. Last year, world GDP growth was -3.6 percent, the lowest since the 2008-2009 financial crisis. On the other hand, the growth rate of South Korea in 2020 was negative one percent, a relatively lower drop than the global economy. Given that neither developed (-4.7 percent growth) nor developing countries (-2.2 percent growth) are able to escape the economic fallout of the pandemic, South Korea's performance looks even better in 2020. This can also be explained by a better employment situation in South Korea. Unlike OECD countries which on average experienced a sharp rise in the unemployment rate from the second to the fourth quarter of 2020, South Korea exhibited a stable trend in its quarterly unemployment rate even after the outbreak of COVID-19.

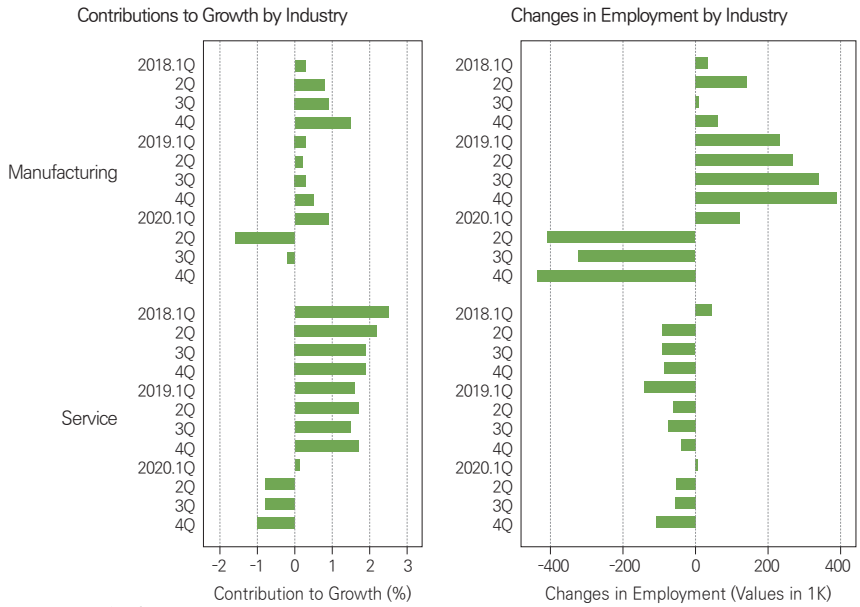
Figure 1. GDP Growth and Unemployment Rate: South Korea vs OECD



Source: OECD (http://data.oecd.org).

The contrasting economic performance of South Korea relative to other countries exposes how important it is for an economy to have a competitive manufacturing base in the midst of a global economic crisis. Regarding its contribution to real GDP growth by industry, Korea's manufacturing industry shows a higher contribution than the service industry in the second half of

Figure 2. Contributions to Growth and Changes in Employment by Industry



Source: Bank of Korea.

2020, when the pandemic was at its peak last year. It clearly contrasts with the general trend that contribution of the service sector to real GDP growth is normally greater than that of manufacturing. In terms of employment, while the pandemic significantly decreased Korea's employment growth in the service sector, manufacturing employment growth has been stable throughout the past year. Indeed, the Korean manufacturing industry has played a critical role as a vital economic pillar during the COVID-19 crisis.

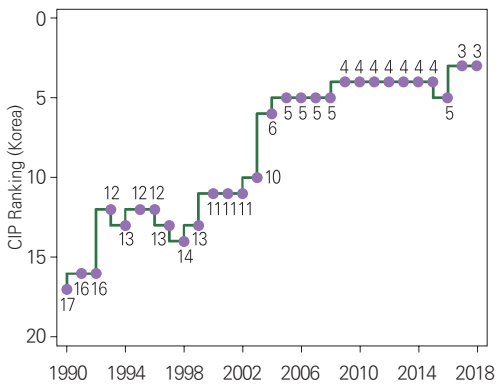
This paper aims to explain the state of Korea's manufacturing competitiveness and assesse whether the Korean manufacturing industry has acted as an economic support during the COVID-19 pandemic through a cross-country analysis. In addition, this paper identifies what the driving force is behind the role of Korea's manufacturing industry in overcoming the COVID-19 crisis and presents policy implications for sustainable growth of the Korean manufacturing industry.

2. The Role of the Manufacturing Industry in Economic Recovery

Where does a country rank among countries in manufacturing competitiveness? Who has increased (or decreased) in the global ranking of manufacturing competitiveness? To answer the question, the United Nations Industrial Development Organization (UNIDO) developed the Competitive Industrial

Figure 3. CIP Ranking of South Korea

CIP Ranking of South Korea



CIP Ranking by Country

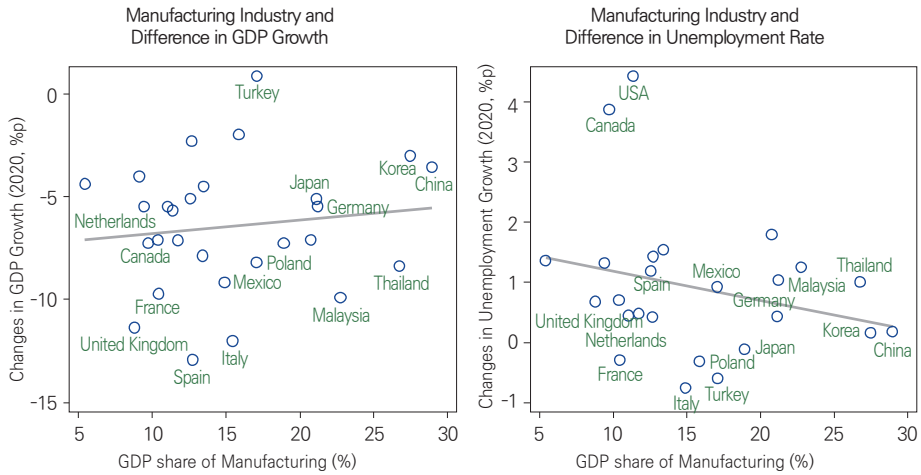
Year	Korea	Germany	China	USA	Japan
2018	3	1	2	4	5
2014	4	1	3	2	5
2010	4	1	5	3	2
2006	5	1	14	2	3
2002	11	1	21	2	3
1998	14	1	23	2	3
1994	13	1	25	3	2
1990	17	1	32	3	2

Source: UNIDO.

Performance (CIP) index and releases country-specific ranks every two years. According to the latest CIP index (July 2020), Korea ranked third, following Germany and China. While the rank of South Korea has consistently gone up since UNIDO began producing the CIP index in 1990, it is the first time South Korea has ranked third, outpacing both the U.S. and Japan simultaneously. On the basis of the third-most competitive manufacturing industry, South Korea managed to tackle slowing economic growth and to protect employment in the COVID-19 crisis.

Cross-country analysis demonstrates how well Korea's manufacturing industry positively affected economic performance last year. Exploiting country-level data on GDP growth, unemployment rate and the share of manufacturing value-added in GDP, this study analyzes the relationship between the degree of manufacturing development, proxied by the share of manufacturing value-added of GDP, and economic indicators in 2020 at the country level. As illustrated on the left side of Figure 4, there is a positive relationship between the GDP share of manufacturing and the extent to which the growth rate of GDP in 2020 declines compared to the previous year (2019), indicating that manufacturing industry actually mitigated the slowdown of economic growth when the pandemic damaged GDP potential seriously last year. The right side of Figure 4 shows that GDP share of manufacturing is negatively related with

Figure 4. Relationship between GDP Share of Manufacturing and 2020 Economic Performance



Source: Compiled by the author using IMF World Economic Outlook Database and UNIDO.

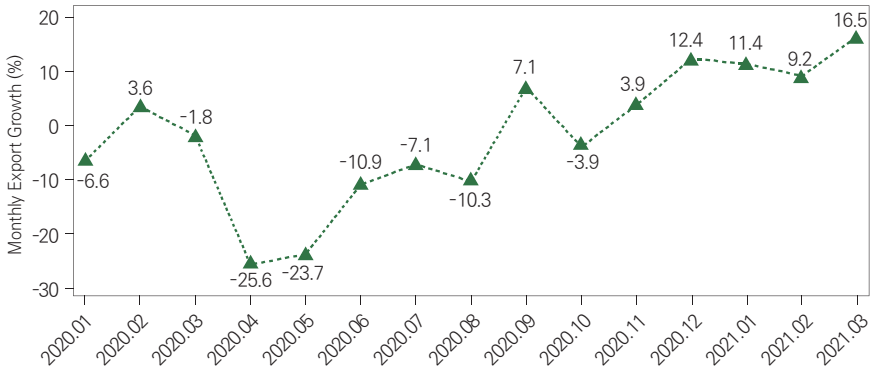
the difference in unemployment rate in 2020, which means that the manufacturing industry also played a role in protecting jobs from economic crisis.

It is noteworthy that the share of the manufacturing value-added of GDP in Korea is among the very highest in the world. As of 2018, the share of Korea's manufacturing value-added in GDP amounts to 27.5 percent, which is higher than twice the 11 percent of the U.S, triple the 8.8 percent of the U.K., and six percentage points greater than the 21.1 percent of Japan. Owing to South Korea's high level of manufacturing development, it exhibited just a three percent decline in 2020 GDP growth and only a 0.2 percent increase in 2020 unemployment growth, both of which are relatively lower than other countries (see the Appendix for details).

3. Export Resilience and Manufacturing Industrial Structure

Despite the COVID-19 pandemic, South Korea has shown a strong export resilience since the second quarter of 2020. Figure 5 presents the trend of monthly export growth from January 2020 to March 2021. As shown in the figure, Korea's exports show a V-shaped recovery. Initially, a majority of experts predicted that South Korea is highly likely to experience a trade collapse in 2020, possibly a deeper collapse than in the 2008-2009 financial crisis, because unlike the 2008-2009 crisis, the COVID-19 pandemic was expected to impact not only financial markets but also real markets. Yet, after reaching a nadir in the second quarter of 2020, export growth quickly rebounded and

Figure 5. Monthly Export Growth in South Korea



Source: KITA.

has continued to climb. Based on its high level of manufacturing competitiveness, Korea's strong export resilience has led to economic recovery even during a pandemic. In other words, it seems that an export-oriented economic structure heavily dependent on the manufacturing industry has contributed to Korea's overcoming the COVID-19 crisis.

As a matter of fact, it is the structure of Korea's core industries that acted as a driving force in its export rebound. This paper measures industry-specific contributions to Korea's monthly export growth rate, and then estimates average contributions by industry both for the period of export reduction (April to July 2020) and for the period of export increase (September to December 2020). The industry-level contributions reveal that the machinery, steel and metals industries led the period of export reduction and that the electronics and petrochemicals industries substantially led the period of export increase. The electronics industry, of which the main products are semiconductors and displays, is Korea's flagship industry, comprising a high proportion of total exports. The petrochemicals industry is also a core industry, ranked fourth in the world (ranking by ethylene production, 2019). This strongly suggests that South Korea has an industrial structure characterized by high export resilience, leading to enduring the economic crisis.

Table 1. Contributions to Export Growth by Industry

Unit: percentage point

Industry	Period of Reduction (March to July 2020)	Period of Increase (Sept. to Dec. 2020)
Agriculture and Fisheries	0.01	0.18
Mining	-3.75	-3.01
Petrochemistry	-1.30	1.49
Plastic·Rubber	-0.59	0.21
Textiles	-0.74	-0.06
Household Products	-0.22	0.12
Steel·Metals	-1.84	0.17
Machinery	-7.16	0.78
Electronics	-1.32	4.79
Others	0.06	0.20
Average Export Growth (%)	-16.86	4.88

Source: Compiled by the author using KITA data.

4. Policy Implications

(1) The Direction for Industrial Policies after COVID-19

The economic crisis will end at some point. It is thus important to get ourselves ready for the post-COVID-19 era. While it is an undeniable fact that South Korea has an industrial structure strong enough to overcome economic crisis, it is less certain that the current industrial structure of South Korea is sufficiently strong enough to maintain a competitive advantage in the post-COVID-19 era.

Since the outbreak of COVID-19, the digital transformation has become a key industrial megatrend as economies are becoming more digitalized and contactless (or "untact") in response to COVID-19. In addition, as people become interested in environment and safety with the pandemic serving as an impetus, the trend toward environmental friendliness is intensifying in the manufacturing industry. Therefore, global competition will be fiercer than before the pandemic in both the digital transformation and green industry.

However, it is hard to say that Korea is particularly competitive in the digital transformation or green industry. According to UNIDO, South Korea is ranked only ninth in medium- and high-tech manufacturing exports, as opposed to third in terms of industrywide manufacturing competitiveness. South Korea is also the world's ninth-biggest emitter of CO_2, suggesting that it has a long way to go before being able to lay claim to being competitive in terms of environmental friendliness.

To continue to be successful in the innovation competition prompted by COVID-19, it is important to make accurate predictions for how the global manufacturing industry will evolve in the post-COVID-19 period, with a particular focus on both the digital transformation and eco-friendly trends. Additionally, it is necessary for policymakers to review existing industrial development strategies, assess the merits and limitations of current policies, and make a future plan for how those new trends can be incorporated with existing industrial policies.

(2) Coping with the Reorganization of Global Value Chains (GVCs)

Recently, the economic conflict between the U.S and China has intensified.

In particular, it seems that the conflict is essentially a fierce competition between two countries over hegemony in high-tech industries such as semiconductors and artificial intelligence (AI). In February 2021, U.S. president Joseph Biden issued Executive Order 14017, requiring "key government agencies to access vulnerability and consider potential improvement to supply chains in four critical industries: semiconductor manufacturing, high capacity batteries, rare earth elements and pharmaceuticals." On June 8, the Biden administration released a report evaluating American supply chains of the four industries. Although the report does not specifically mention any direct actions targeting China, it is accepted that the conflict with China in high-tech industries spurred this investigation.

The ongoing economic and political conflict between the U.S and China is likely to affect negatively Korean companies and thus the Korean economy. This is because Korea's core industries such as semiconductors and displays manufacturing are deeply connected to global value chains (GVC) and, more importantly, both the U.S and China are Korea's key GVC partner countries.

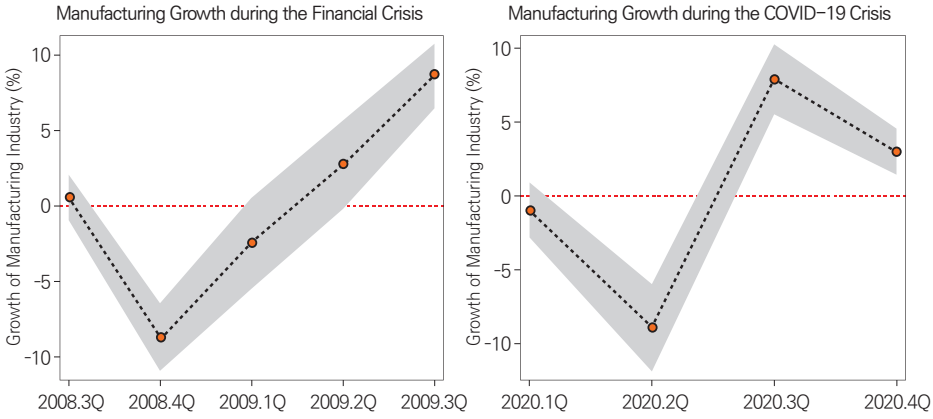
While Korea's detailed plans for this issue should be drawn up as circumstances demand, the Korean government, from a long-run point of view, needs to consider strengthening Korea's own (or domestic) supply chain by locally producing key materials and parts used in core manufacturing industries. To this end, support for R&D should be emphasized. The government also needs to address declining business dynamism in the changing global situation. Regulatory reform and support for business' overseas expansions thus need to be bolstered.

(3) Focusing on Preventing the Resurgence of COVID-19

In 2020, Korea's quarterly manufacturing growth suddenly dropped in the second quarter, but immediately rebounded in the third quarter, possibly reflecting Korea's economic resilience amid the crisis. However, manufacturing growth in the fourth quarter of 2020 fell again, being unable to sustain the third quarter recovery due to a COVID-19 resurgence with colder weather and with people spending more time indoors in close quarters.

In opposition to the V-shaped trend in manufacturing trend shown during

Figure 6. Growth of Manufacturing Industry during Economic Crises



Source: Bank of Korea.

the 2008-2009 financial crisis, the trend following the outbreak of the COVID-19 pandemic is N-shaped. This implies that any future manufacturing-led economic recovery from COVID-19 will significantly be dependent on whether or not a resurgence COVID-19 occurs later on.

In order to maintain Korea's manufacturing production capacity afterwards, it is crucial to increase vaccination rates and accomplish herd immunity as soon as possible. Furthermore, it is also critical to prepare to meet pent-up demand, which refers to the public's return to normal consumption following a period of spending decline, by keeping the K-quarantine system of contract tracing and self-isolation at full operational capacity.

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〈Appendix〉 Manufacturing Industry and 2020 Economic Performances by Country

Country	Difference in GDP Growth (2020, %p)	GDP Growth (2020, %)	Difference in Unemploy-ment Rate (2020, %)	Unemploy-ment Rate (2020, %)	GDP share of Manufacturing (2018, %)
Turkey	0.9	1.8	-0.6	13.1	17.1
Egypt	-2.0	3.6	-0.3	8.3	15.9
Pakistan	-2.3	-0.4	0.4	4.5	12.7
South Korea	-3.0	-1.0	0.2	3.9	27.5
China	-3.6	2.3	0.2	3.8	28.9
Nigeria	-4.0	-1.8	–	–	9.1
Australia	-4.4	-2.4	1.4	6.5	5.4
Saudi Arabia	-4.5	-4.1	–	–	13.5
Russia	-5.1	-3.1	1.2	5.8	12.6
Japan	-5.1	-4.8	0.4	2.8	21.1
Germany	-5.5	-4.9	1.0	4.2	21.2
Brazil	-5.5	-4.1	1.3	13.2	9.4
Netherlands	-5.5	-3.8	0.4	3.8	9.4
USA	-5.7	-3.5	4.4	8.1	11.0
Indonesia	-7.1	-2.1	1.8	7.1	20.7
Kazakhstan	-7.1	-2.6	0.7	5.5	10.4
South Africa	-7.1	-7.0	0.5	29.2	11.7
Poland	-7.3	-2.7	-0.1	3.2	18.9
Canada	-7.3	-5.4	3.9	9.6	9.7
Argentina	-7.9	-10.0	1.5	11.4	13.4
Mexico	-8.2	-8.2	0.9	4.4	17.0
Thailand	-8.4	-6.1	1.0	2.0	26.7
Italy	-9.2	-8.9	-0.8	9.1	14.9
France	-9.7	-8.2	-0.3	8.2	10.4
Malaysia	-9.9	-5.6	1.3	4.5	22.7
UK	-11.4	-9.9	0.7	4.5	8.8
India	-12.0	-8.0	–	–	15.4
Spain	-12.9	-11.0	1.4	15.5	12.7

Source: Compiled by the author using IMF World Economic Outlook Database and UNIDO.