

The Impact of the COVID-19 Pandemic on Korea's Regional Economies

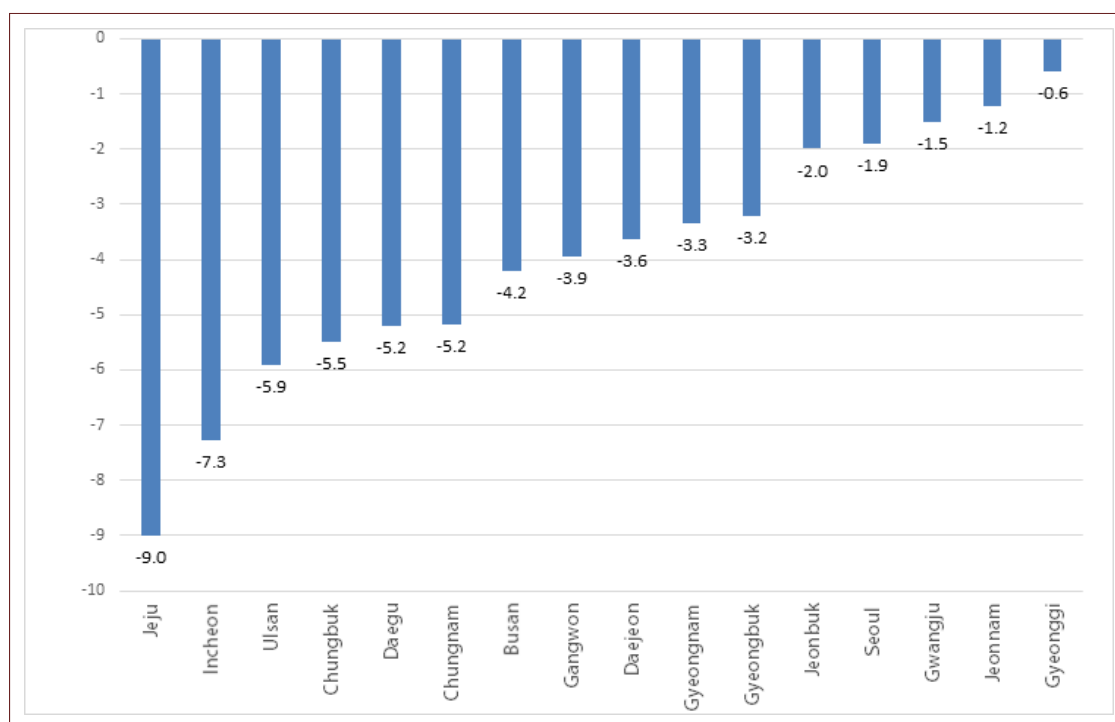
| Summary |

- In this paper, we estimate the impact of the COVID-19 pandemic-induced recession on Korea's regional economies. We have found that the recession has hit the island province of Jeju and the cities of Incheon and Ulsan the hardest, in that order. For Jeju in particular, we estimated that the province's real gross regional domestic product (GRDP) declined by 9% compared to the pre-pandemic trend, a figure 2.5 times greater than the estimated impact of the pandemic on nationwide GDP growth.
- Regional COVID-19 infection rates do not appear to be meaningfully correlated with the regional distribution of economic shocks. Rather, the regional industrial structures seem to account for the distribution of economic shock better. GRDP growth declines were steepest in the regions where particularly hard-hit subsectors (such as traditional, face-to-face services, among others) comprise a large portion of the regional economy. In Jeju, the hardest-hit region, the share of hospitality businesses in the regional economy is greatest in the nation and the share of transport and culture businesses is the second-largest. Incheon has the highest share of transport businesses in the nation, with a large gap between it and the next-highest region.
- The regions that suffered the most are also lagging in the ongoing recovery. The city of Seoul and surrounding province of Gyeonggi, where the economic impact of the pandemic was comparatively mild, recovered pre-pandemic growth trends by the first quarter of 2021, while the economies of Jeju, Incheon, and the province of Gangwon were still slumping by that quarter.
- As the impact and rate of recovery vary greatly by region, should the gap in the pace of regional economic recovery persist, corrective measures will be necessary to address the imbalance. An appropriate policy response could take either of the following forms: (1) strengthen support for the industries and subsectors in the deepest slumps, or (2) provide direct support for economies in the hardest-hit regions.

■ **GRDP Shock Hits Hard in Jeju, Incheon, and Ulsan**

- Since GRDP data is only available up to 2019, we analyze production indices of industry and services released up to the first quarter (Q1) of 2021 and estimate changes in GRDP after the outbreak of the pandemic in order to estimate the COVID-19 pandemic’s impact on provincial and metropolitan GRDP (see the appendix for a detailed explanation of the methodology).
- Our estimation shows that the economic shocks of COVID-19 were most strongly felt in Jeju, Incheon and Ulsan, in that order. Jeju’s GRDP growth rate plunged by approximately 9%, a drop nearly 2.5 times greater than the decline in Korea’s GD.¹⁾ The impact of the pandemic on Seoul and Gyeonggi has been relatively modest in comparison.

Figure 1. The COVID-19 Pandemic’s Impact on GRDP, by Region

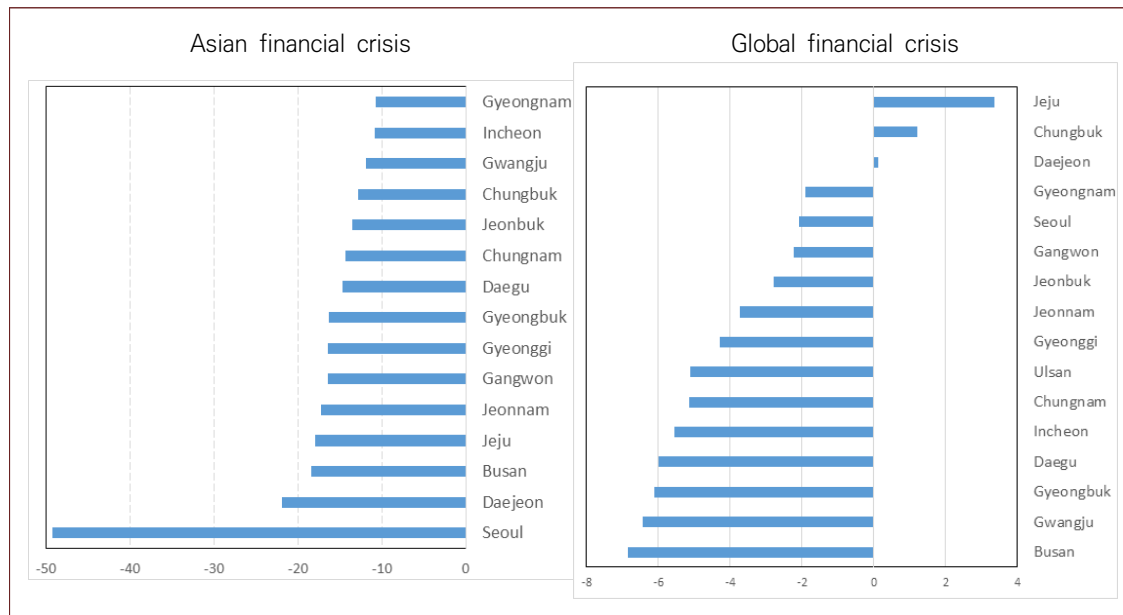


Source: Author’s estimates of GRDP based on Statistics Korea’s mining and manufacturing production and service industry production indices.

Note: See the appendix for an explanation of the methodology employed in the estimations.

1) The impact on the nationwide GDP growth rate is estimated to be around 3.7 percentage points. See Kang Duyong, Min Sunghwan, Park Sungkeun, “The Korean Economy One Year after the COVID-19 Pandemic Outbreak,” *i-KIET Issues and Analysis*, Vol. 109, May 10, 2021.

Figure 2. Regional Distribution of Economic Shocks in Prior Crises



Source: National Statistics Office, KOSIS.

Note: Rate in percentage points. Based on the difference between annual growth rate of the trough year and the pre-crisis 5-year average growth rate.

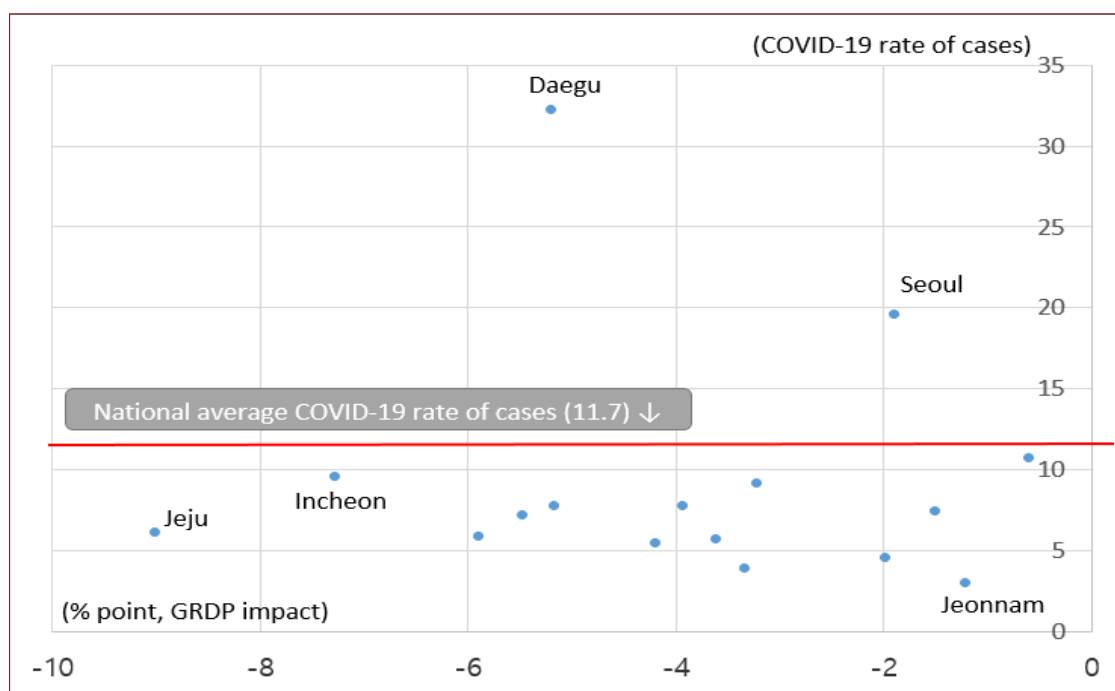
- The regional distribution of economic impact during the COVID-19 pandemic differs sharply from those of previous economic crises. Jeju has been hit the hardest this time, while the region suffered the least from the shocks of previous crises. And while the province of Gyeongnam and the city of Busan endured the heaviest blow during the Asian financial crisis and the global financial crisis respectively, they felt relatively smaller shocks in the current crisis.

▣ Weak Correlation between Economic Impact and Rate of COVID-19 Infections

- Though it is easy to think of the regional COVID-19 infections rates as the determinant of the economic shocks in each region, there is actually a very weak correlation between the two indices.
- Jeju, which has suffered the worst economic shock, has had the fewest COVID-19 cases per capita, far fewer than the national average. By contrast, the Seoul area, which has the second-highest number of COVID-19 cases, has experienced a relatively mild economic impact.

- This differs from the close correlation exhibited by the distribution of economic shock and the number of cases and deaths during the pandemic on a country-by-country basis. This seems to be because despite the spread of infection, the movement of people and goods across regions within a country is far less difficult than across countries.

Figure 3. Comparison: Regional COVID-19 Infection Rates and Economic Impact



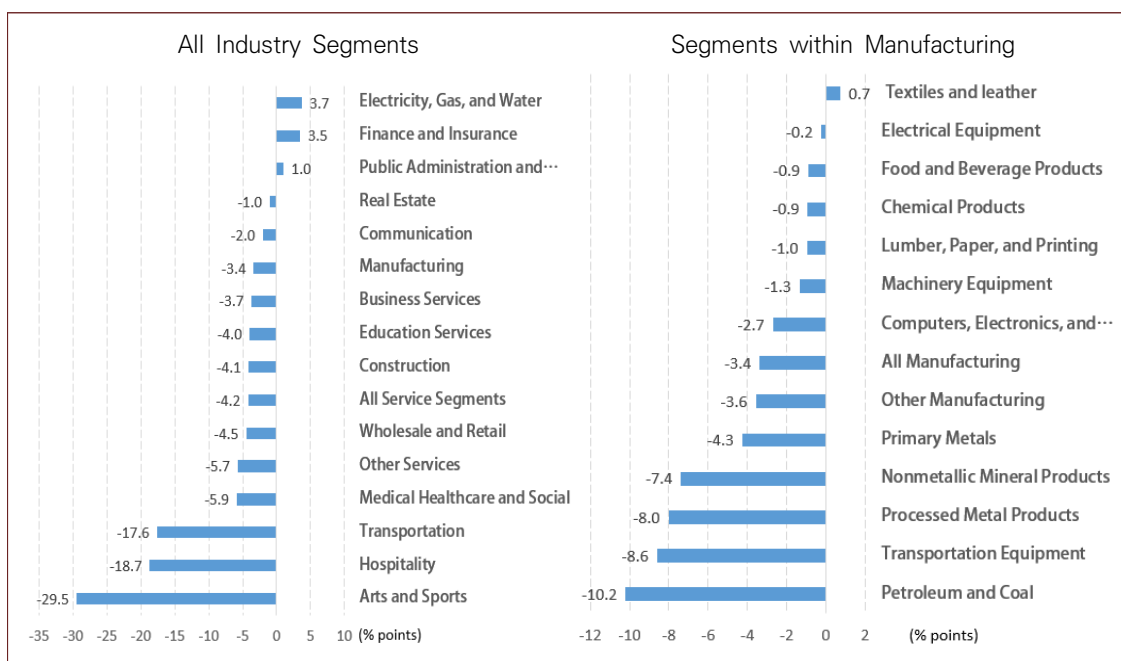
Note: 1) Horizontal axis: GRDP impact. Vertical axis: confirmed cases of COVID-19 per 10,000 people (as of the end of 2020).
 2) Correlation coefficient: 0.04

■ Distribution of Economic Shock Closely Tied to Regional Industrial Structure

- The key determinant of regional distribution of economic shocks seems to be the difference in the regional industrial structure. Regions where negatively-impacted industries accounted for a large portion of the local economy experienced relatively stronger economic shocks. During this crisis, face-to-face services such as the hospitality, cultural services, and transportation sectors were hit hardest, whereas the petroleum and coal segments felt the most severe shocks in the manufacturing industry. (Figure 4)

- Regions where the aforementioned business segments comprise a large portion of local economy tend to have experienced greater economic shocks.
- Of the 17 local economies, the share of the hospitality industry was the largest in Jeju comprising 6.6% of the local economy. Jeju also has the second-highest share of transportation and cultural services. Incheon, second only to Jeju in terms of economic shocks absorbed, has the largest concentration of transportation services (10.9%) in the country. And the economy of the city of Ulsan has a high concentration of the weakest-performing manufacturing sector in this crisis: the city's petroleum and coal sector accounts for 27.3% of the local economy. This figure is more than double that of the province of Chungnam, which has the second-highest proportion of oil and coal-related industries.

Figure 4. Impact of the COVID-19 Pandemic on Production by Domestic Industry



Source: Bank of Korea ECOS.

Notes: Change between pre-pandemic trends and 2020 growth rate.

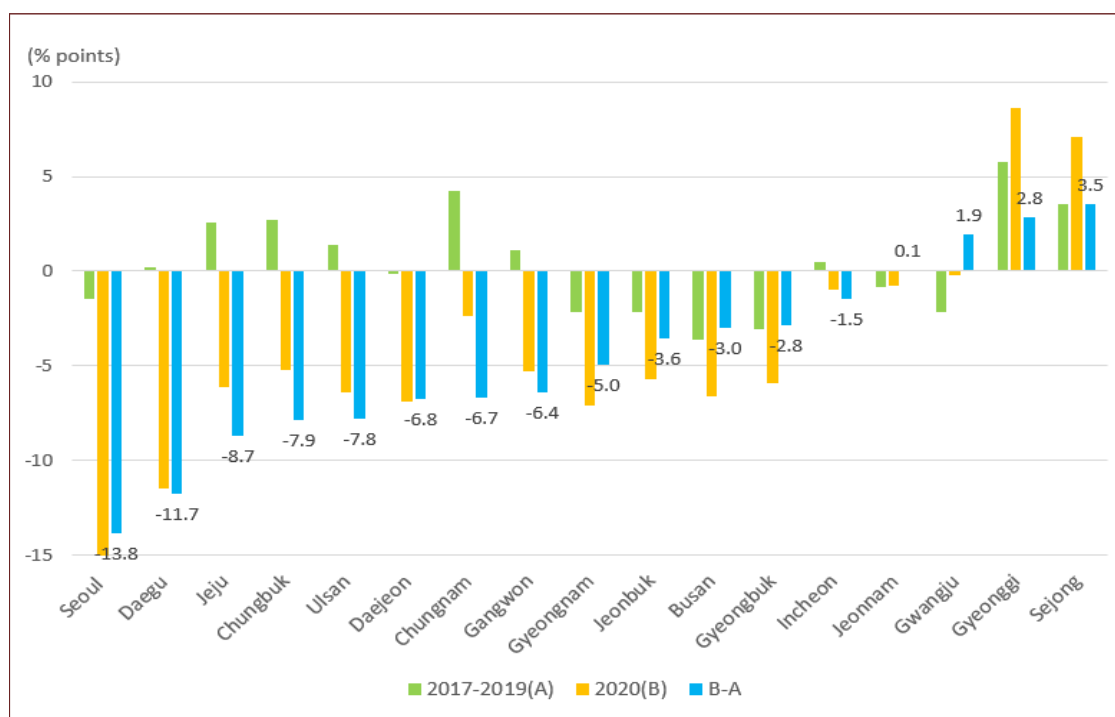
Table 1. Share of Key Service Sector in GRDP (2019 nominal values)

Unit: %

	Transportation	Hospitality	Cultural Services	Subtotal
Seoul	2.6	3.1	3.3	8.9
Busan	6.8	3.5	3.5	13.8
Daegu	3.6	3.1	3.8	10.4
Incheon	10.9	2.8	3.5	17.2
Gwangju	3.0	2.8	3.9	9.7
Daejeon	2.5	2.9	3.6	9.0
Ulsan	2.5	1.6	1.8	5.9
Sejong	1.1	1.6	1.9	4.6
Gyeonggi	2.6	2.2	3.0	7.8
Gangwon	3.8	4.4	5.0	13.1
Chungbuk	2.4	2.0	3.0	7.4
Chungnam	2.1	1.8	2.0	5.9
Jeonbuk	2.9	2.6	3.6	9.1
Jeonnam	4.1	2.0	2.7	8.8
Gyeongbuk	2.5	2.0	2.8	7.3
Gyeongnam	2.7	2.4	2.9	8.1
Jeju	4.7	6.6	4.7	16.0

Source: Statistics Korea KOSIS.

Figure 5. Impacts on Mining and Manufacturing Production by Region



Source: Statistics Korea KOSIS.

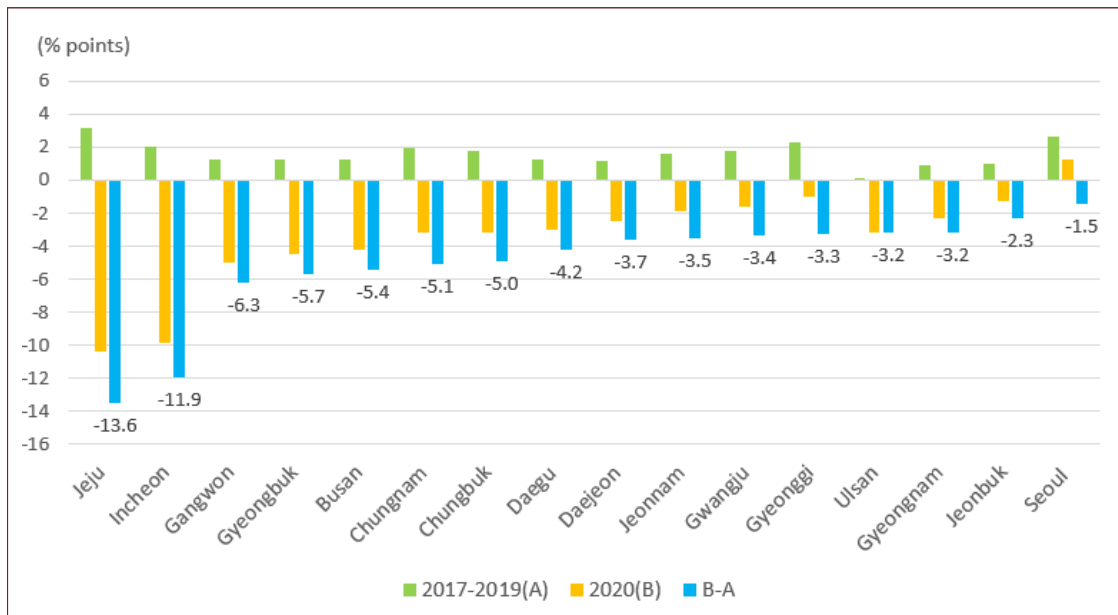
■ Economic Shocks in the Mining and Manufacturing Sector

- The economic shocks experienced by the mining and manufacturing sector were most severe in the cities of Seoul and Daegu and in the province of Jeju, in that order. The impact of the pandemic on mining and manufacturing production showed a slight correlation with regional infection rates. Seoul and Daegu, where mining and manufacturing production was impacted the hardest, have the highest per capita infection rates in the country (Daegu is first overall; Seoul is second). Although the data show that the mining and manufacturing firms in Seoul suffered most heavily, the overall influence of these shocks on Seoul's GRDP has been low because manufacturing comprises a very minor proportion of Seoul's GRDP.

■ Service Production Impacts by Region

- The impact on service production was most severe on the island province of Jeju, followed by the city of Incheon and the province of Gangwon. We surmise that this impact is closely tied to the industrial composition of these regions. In Gangwon, cultural services account for 5% of GRDP, the highest ratio in the country. Gangwon also has a large proportion of hospitality services (4.4%), second only to Jeju. Although Gangwon's service sector was seriously affected, this did not have a large impact on Gangwon's GRDP because public administration and national security services account for a large proportion of the regional economy (23.8%). Public sector services are not included in service industry indices and have not been fairly insulated from the economic impact of the COVID-19 pandemic.

Figure 6. Impact on Service Production by Region

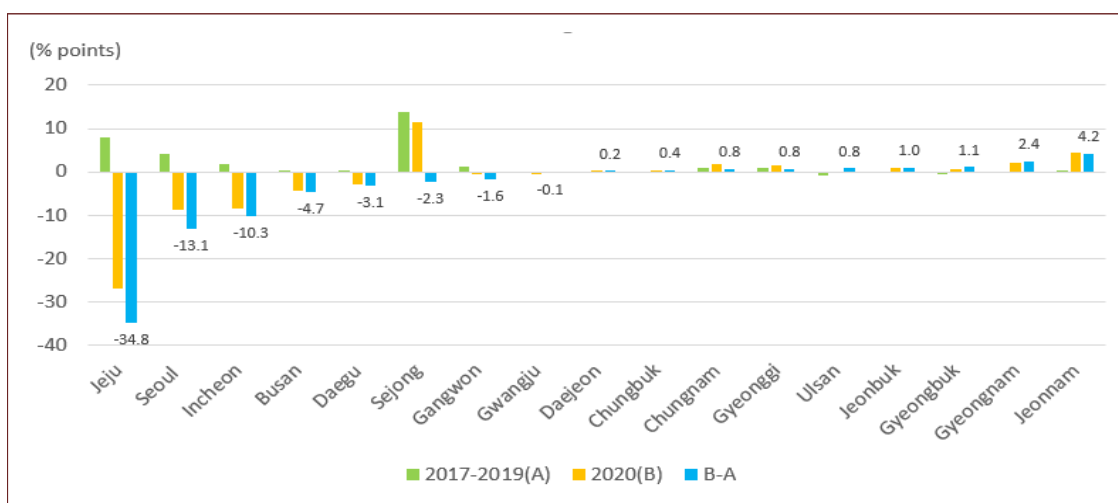


Source: Statistics Korea KOSIS.

■ Retail Sales Impacted Most Severely in Jeju and in Large Cities

- COVID-19’s impact on retail sales was extremely severe in Jeju (-34.8%) and in large cities in general. We infer that retail sales were hit particularly hard in large cities owing to the fact that retail sales in major urban areas are typically concentrated in crowded shopping centers, making those areas more vulnerable to contagious diseases.

Figure 7. Impact on Retail Sales by Region

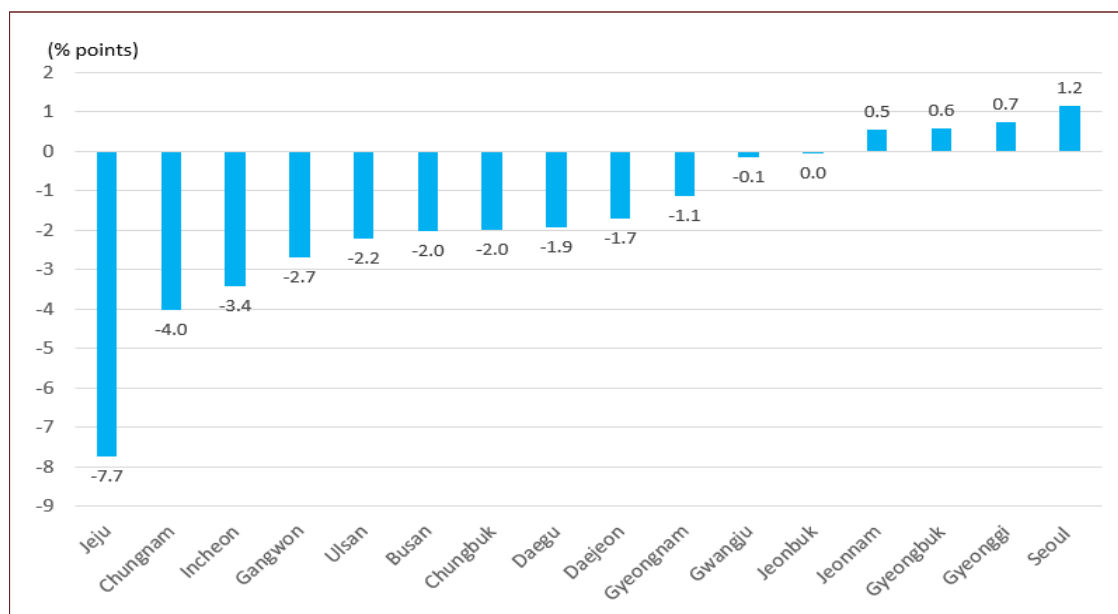


Source: Statistics Korea KOSIS.

■ Harder-Hit Regions Recovering More Slowly

- Data up to Q1 of 2021 indicate large regional differences in economic recovery from the crisis. First, GRDP trends shows that the city of Seoul and the province of Gyeonggi have recovered, surpassing pre-crisis trends in Q1 of 2021. On the other hand, the GRDP of Jeju, Chungnam, Incheon, Gangwon, and others are still well below the pre-pandemic trends. GRDP figures for Jeju, where the crisis hit hardest, remained more than 7% below pre-pandemic trends in Q1 of 2021.
- The mining and manufacturing sector has demonstrated a relatively fast rate of recovery. Related industries in close to half of all regions have recovered pre-pandemic levels. However the other half continues to perform poorly and the interregional gap is widening. For regions where the decline in mining and manufacturing production was relatively small, the recovery is proceeding quickly. In regions where the overall shock was large, such as Jeju and Ulsan, economic sluggishness continues.
- In the case of services production, only Seoul had returned to pre-pandemic trends Q1 2021. Jeju, Incheon, and Gangwon, where the shocks of the crisis were the largest, still exhibit weak performance.

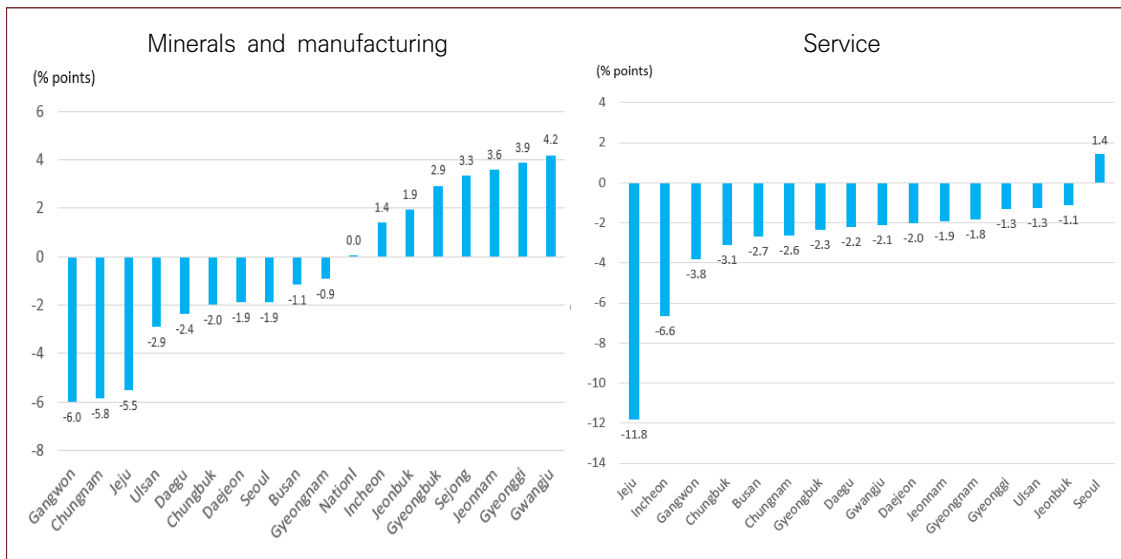
Figure 8. Regional Comparison of GRDP Recovery Trends (Q1 2021)



Source: Statistics Korea KOSIS.

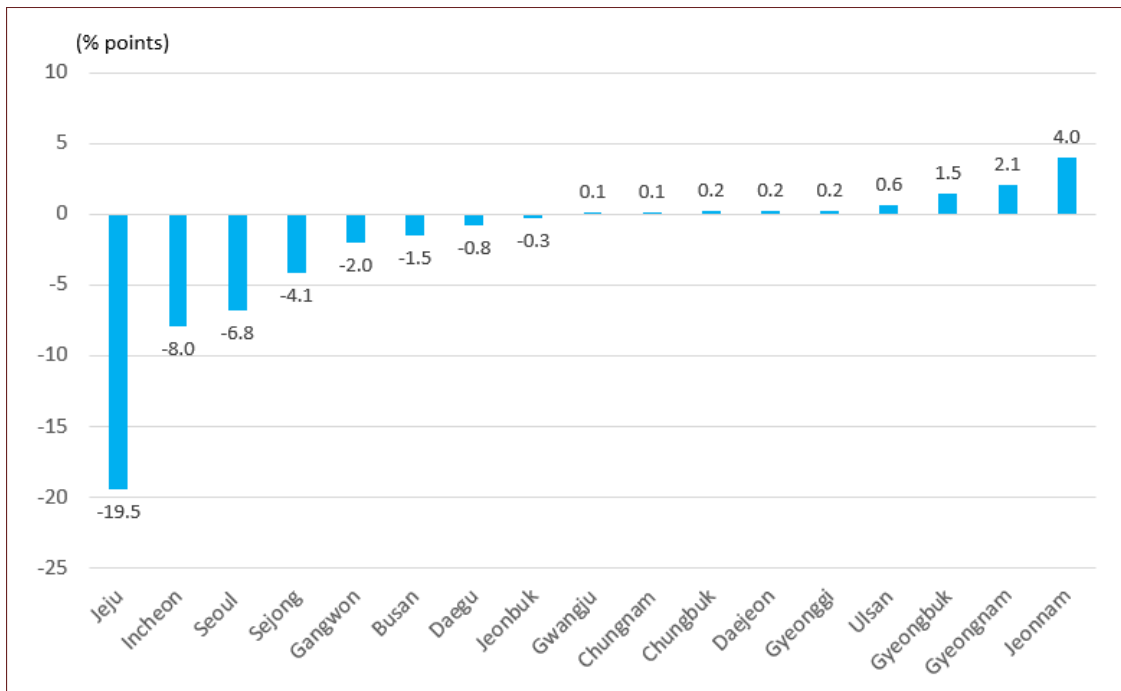
Note: Estimation methodology in appendix.

Figure 9. Regional Comparison of Industrial Production Recovery (Q1 2021)



Source: Statistic Korea KOSIS.

Figure 10. Regional Comparison of Recovery in Retail Sales (Q1 2021)



Source: Statistics Korea KOSIS.

■ Implications for Policy

- Policies to address the regional gaps in the speed of economic recovery may be necessary should the current trends continue. Concerns are mounting over the possibility of worsening interregional economic disparity given that the regions hardest-hit by the crisis are recovering the slowest.
- Policies could focus on the industries most seriously affected by the coronavirus pandemic or provide direct assistance to the regions where the shock was concentrated. The worst-affected regions are those in which the worst-affected industries comprise a significant proportion of the regional industrial structure. It is possible to provide indirect support for regional economic recovery by focusing on support tailored to the impacted industries. And if regional differences in the recovery prove to be very large, direct support to impacted regions should be added.

< Appendix >

■ GRDP Impact Estimation Methodology

- Because official GRDP data is only available up to 2019, we used the following methodology to estimate the changes in GRDP after the onset of the pandemic.
- Since the mining and manufacturing production index and the service industry production index are available up to the first quarter of 2021, we used those time series data and the shares of those sectors in nominal 2019 GRDP.
- First, to estimate the impact of COVID-19 pandemic on sectoral production, we calculated pre-pandemic trends using the average growth rates of production indices for the three years before 2020 and then compared these trends with the 2020 growth rates. The differences between the 2020 growth rates of sectoral productions and their pre-pandemic trends are considered as the sectoral impacts. Then we calculated the impact on GRDP by multiplying these sectoral impacts by the share of each sector in 2019 nominal GRDP and summing them.
- This method of calculating GRDP is built on the premise that industries that are not part of mining and manufacturing or service production indices such as agriculture, construction, utility, and public administration have not been impacted by the COVID-19 crisis.
- The extent of recovery in Q1 of 2021 was estimated by comparing the pre-pandemic trends with the annual average growth rate for Q1 of 2019 to Q1 of 2021.

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