

Economic Impact of International Spread of COVID-19

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Outline

- ▶ COVID-19 continues its spread from China, Asia, through Europe and to the US
- ▶ **Macroeconomic Impact: Scenario Analysis** Depending on magnitude of spread, the fall in Korea's real GDP is estimated at between 0.51% to 1.02%.
 - World (-0.57 to -1.13%), US (-0.36 to 0.72%), China (-0.91 to -2.03%)
- ▶ **Goods Export** International spread of COVID-19 can be expected to reduce demand for intermediate and capital goods from Korea's major trading partners.
 - During initial stages of Influenza A outbreak in the US (April-August 2009), US imports declined by 13.1% in total, and 11.4% from Korea (against pre-pandemic levels)
 - Intermediate goods (including capital goods) accounted for the majority of drop in imports, continuing up to development and distribution of vaccine.
- ▶ **Services Export** Negative impact on travel and transport services exports
 - Other factors having a negative effect on services export included a fall in the number of foreign students, delays in entering the country, and restrictions posed on supply of professional services.
- ▶ **Domestic Consumption** Losses seen in food services industry, wholesale and retail, travel and leisure, lodging industry, etc. due to drop in consumer confidence
 - On the other hand, transaction increase seen by some goods and services traded via e-commerce

1. Macroeconomic Impact: Scenario Analysis

■ **Model** Computable General Equilibrium model was used to determine the impact of COVID-19 on the Korean economy, based on the latest updated data

- Japan, US, EU, ASEAN, Australia, Canada, and ROW were included in the analysis as China and Korea's major trading partners.
- GTAP Data Base version 10 (reference year 2014) was used and macro indicators including the growth rate, population, labor growth rate, provisions of FTAs with Korea were updated to the latest data.

■ **Scenarios** Two scenarios were considered, based on the loss in labor supply, consumer confidence, rise in trade costs, etc. due to spread of COVID-19

- **Supply Side** Ratio of working age population affected by COVID-19 through direct or indirect channels set as 10% (Scenario 1) and 20% (Scenario 2) to estimate fall in labor supply¹⁾
- **Demand Side** The factor of shrinking consumer confidence in the travel, leisure sectors, etc., caused by the spread of infection was reflected regardless of changes in income or commodity prices.
 - Building on the analyses of McKibbin and Fernando (2020), we set the rate by which household consumption looks to shrink in each nation, based on the decline rate of consumer spending shown in Hong Kong during the outbreak of Severe Acute Respiratory Syndrome (SARS), also taking into account the size against GDP represented by the travel, transport, leisure services industries in each nation.

Table 1. Magnitude of supply side and demand side shocks attributed to major economies in each scenario

(unit: %)

		Korea	China	Japan	US	EU
Scenario 1	Supply Shock	-0.67	-1.24	-0.59	-0.48	-0.88
	Demand Shock	-1.17	-1.31	-1.33	-1.39	-1.25
Scenario 2	Supply Shock	-1.39	-2.60	-1.24	-0.99	-1.67
	Demand Shock	-2.93	-3.28	-3.30	-3.49	-2.83

Source: Authors' estimates based on McKibbin and Fernando (2020).

- **Trade Perspective** Rise in transaction costs across the global value chain of production will push trade costs higher if travel restrictions, custom delays, decrease in freight shipments continue.

1) Mortality rates were set at 2.0% and 2.5%, respectively, for Scenarios 1 and 2, and infected workers were assumed to lose a total of 21 days of work for diagnosis, self-quarantine, etc. The reduction rate of labor supply in China was calculated first and the rate in other regions follows, based on which we projected reduction rates for labor supply in each of the nations surveyed, factoring in city population concentration levels, plane travel to and from China, Global Health Security Index scores, and per capita health expenditure for each nation (see McKibbin and Fernando, 2020)

- Effects on global value chains taken into consideration under Scenarios 1 and 2 by assessing tariff equivalents for each industry²⁾
- For instance, in the case of trade between Korea and China, trade costs were assessed by imposing additional tariffs calculated for each industry: agriculture, livestock and fisheries (0.9–1.9%); mining industry (1.1–1.5%); textile and clothing (4.0–7.9%); chemical products (1.9–3.9%); steel and non-ferrous metals (3.4–4.5%); transport equipment (3.1–4.7%); electric & electronic products (6.0–9.0%); machinery (2.2–3.3%)

■ **Result of Analysis** Depending on level of COVID-19 spread, Korea’s real GDP projected to fall by 0.51–1.02%, global real GDP by 0.57%–1.13%

Table 2. Macroeconomic Impact by Scenario

	Korea	China	Japan	US	EU	ASEAN	Canada	Australia	World
Scenario 1	-0.51	-0.91	-0.38	-0.36	-0.54	-0.67	-0.36	-0.36	-0.57
Scenario 2	-1.02	-2.03	-0.74	-0.72	-0.95	-1.28	-0.73	-0.83	-1.13

Source: Authors’ calculations.

2. Goods Trade

■ The likelihood of overseas demand falling due to international spread of COVID-19, thus leading to a loss in exports of Korean products, was measured by reviewing the situation during the initial stages of the Influenza A/H1N1 pandemic (April–August 2009)

- Following the first confirmed case of Influenza A/H1N1 in April 2009 approximately 60 million people contracted the novel flu, causing an estimated 12,000 deaths before the pandemic ended in August 2010.³⁾
- The pandemic shows similarities to the current spread of COVID-19 in that local transmission proceeded rapidly, making it a valuable precedent to base predictions upon of the economic impact of COVID-19 should it spread on a global scale.

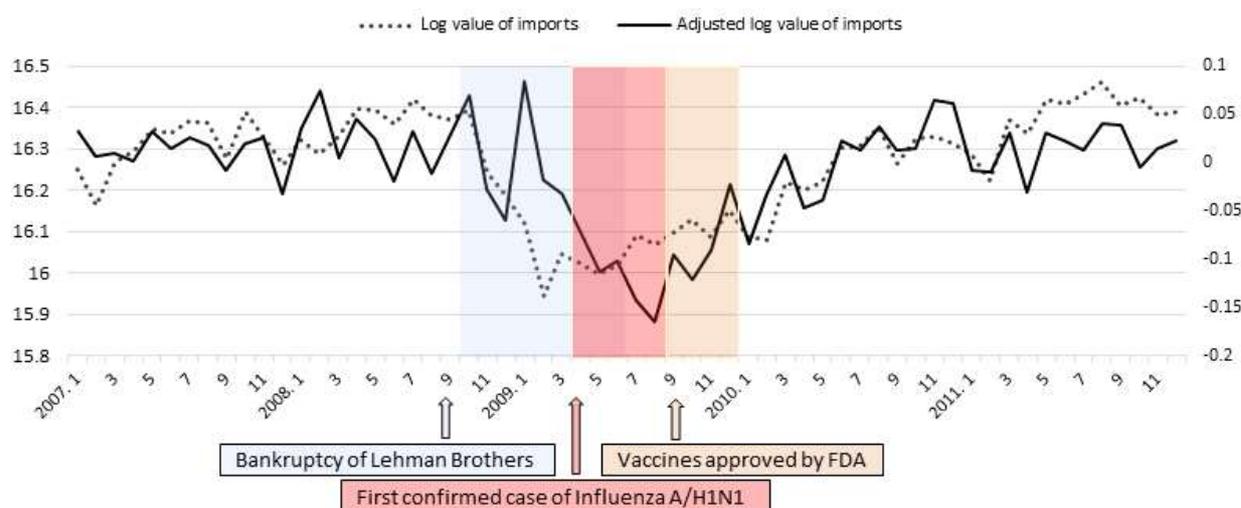
■ The results of a recursive analysis using data on US monthly imports from the world for the period of 2007 to 2011 show a 13.1% fall in US imports from the world during the initial period of spread (from April 2009, when the first confirmed case appeared, to August 2009), while imports from Korea fell by 11.4% (periods

2) See KIEP (2017)

3) https://www.cdc.gov/h1n1flu/estimates_2009_h1n1.htm (accessed on March 9, 2020)

compared: January 2007–March 2009 against September 2010–December 2011).⁴⁾

Figure 1. Fluctuations in US imports from world (2007–11)



Notes: 1) Log value of imports calculated as the monthly average of log (imports) by product item (4-digit HS code)

2) Adjusted log value of imports calculated as the residual gained by removing yearly, monthly, industry, and product type fixed effects and impact of the 2008 financial crisis from the log value of imports

Source: Prepared by authors using monthly data by product item provided by the US International Trade Commission (USITC).

■ While the pandemic continued up to August 2010, the decline in US imports began to abate after vaccines were approved by FDA in September 2009. The Influenza A/H1N1 appeared to have almost no dampening effect on imports from 2010.

- The implication is that vaccine development was a major turning point in eliminating uncertainty and restoring consumer confidence in the US economy.

■ During the initial stage of the pandemic (April–August 2009), the majority of the decline in US imports can be attributed to shrinking demand for intermediate goods (including capital goods) rather than consumer goods.

- **Consumer Goods** The decline in US imports, both from the world and from Korea, was evident in a number of industries but this declining effect was not significant when averaged out across all industries.

- **Intermediate Goods and Capital Goods** The decline in US imports, both from the world and from Korea, was evident in the majority of industries and significant when averaged out across all industries.

4) The pandemic was divided into four periods (Apr–Aug 2009, Sep–Dec 2009, Jan–Apr 2010, May–Aug 2010) with economic effects calculated for each period. The fixed effects for each year, month, industry (by 2-digit HS code) and product type (consumer goods, intermediate goods, capital goods, etc.) were controlled for, as were the effects from the 2008 global financial crisis (October 2008–June 2009).

Table 3. Korean export amounts and ratio of main nations impacted by COVID-19 (2017-2019)

	US		EU		China		Japan		Total	
	Consumer Goods	Intermediate Goods								
Annual average of exports (US\$ billion)	19	52.5	9.8	44.8	5.4	141.3	3.5	25.1	37.7	263.7
Export ratio (%)	29.0	10.4	14.9	8.8	8.2	27.9	5.3	5.0	57.4	52.1

Note: Intermediate goods include capital goods, and export ratio refers to the proportion accounted for by the country among Korea's exports of consumer goods and intermediate goods to the world.

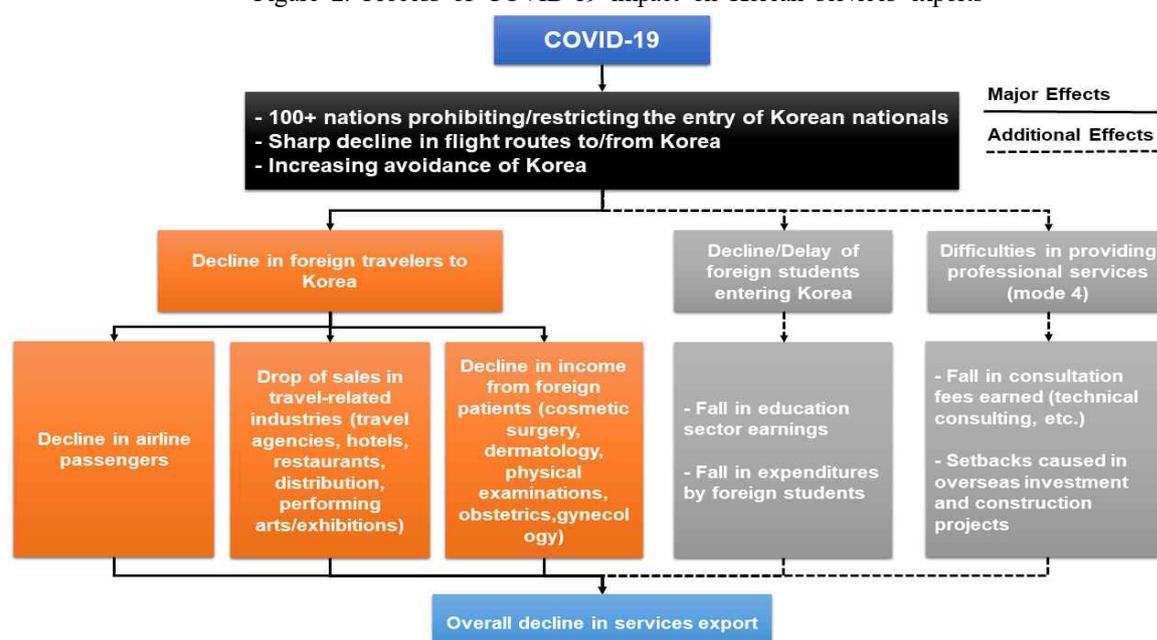
Source: Authors' calculations.

- When considering the US' experience with the Influenza A/H1N1 pandemic, spread of COVID-19 is expected to lead to a decline in exports for Korea, at least until a vaccine can be developed and deployed.

3. Services Trade

- The largest economic impact on Korean services trade caused by the spread of COVID-19 will be seen in the loss of foreign travelers, followed by a decline or delay in foreign students entering the country and restrictions in the supply of professional services.

Figure 2. Process of COVID-19 impact on Korean services exports



Source: Authors' own compilation.

- Due to the decline of foreign visitors and increasing number of nations restricting travel from Korea (123 countries and regions, as of March 12, 2020) flight routes from/to Korea have been cut back drastically. The airline travel industry is expected to show a sharp fall in revenue.
 - The number of visitors to Korea shrunk by 45.1% in February (YoY), when COVID-19 began to show signs of worldwide transmission, indicating a sharp decline in the inflow of foreign travelers to Korea.
 - The year-on-year decline in visitors from abroad in the month of February, based on the number of passengers entering Incheon International Airport, is as follows: Hong Kong (-75.6%), China (-74.1%), Japan (-50.5%), Taiwan (-54.1%), Thailand (-41.7%), Vietnam (-23.7%), Australia (-14%), Philippines (-13.4%), Europe (-6.1%), US (-6.9%).
 - According to scenario analysis conducted by the International Civil Aviation Organization (ICAO), international flight passengers expected to fall by 5.3 to 6 million in 1Q 2020, projecting losses of US\$ 1.1 to 1.2 billion in earnings by airlines landing in/departing from Korea⁵⁾

- The fall in travelers from abroad is expected to lead to a contraction of exports in travel-related and medical services.
 - Based on 2018 data on shopping by foreign visitors in Korea, the areas most deeply affected will be cosmetics manufacturing, food and beverage manufacturing, clothes and shoes manufacturing, mostly at duty-free stores, road-shops, and local markets.
 - A total of 17.5 million foreigners visited Korea in 2019, up by 14.0% from the previous year, generating US\$ 21 billion 510 million in tourism earnings (16.5% increase from previous year).
 - Services exports in hotel/lodging, food and dining, railroad and car transportation, travel agencies/guiding services, and other areas linked to the travel sector will fall sharply as well.
 - The number of foreign patients entering Korea to receive medical services will dramatically fall as well. Earnings from these foreign patients (medical services exports) will shrink significantly.
 - In the year 2018, a total of 378,967 foreign patients from 190 countries travelled to Korea in search of medical services. By nationality, Chinese patients were the largest group (31.2%), followed by US (11.9%), Japanese (11.2%), Russian (7.2%) and Mongolian patients (3.7%).

- Other factors will include the loss of earnings in the education sector and living expenses by foreign students in Korea, loss in consultation fees for professional services, and setbacks seen in overseas investment and construction projects conducted by Korean businesses.
 - As students from nations imposing strict control measures on travel to and from Korea represent a large proportion of the foreign students studying in Korea, we expect many of these students to postpone or forfeit their studies in Korea. This will lead to a loss in earnings in the education sector and living

5) <https://www.icao.int/sustainability/Pages/Economic-Impacts-of-COVID-19.aspx>.

expenses incurred by these students.

- Based on 2019 data, the number of foreign students studying in Korea was 160,165, showing an annual increase of 13.5% on average throughout 2014-2019. Foreign students were mostly from China (44.4%), Vietnam (23.4%), Uzbekistan (4.7%), Mongolia (4.6%), Japan (2.7%), and the US (1.8%).
- We expect acute difficulties in the supply of professional services overseas, with more than 100 nations placing restrictions on travel from Korea. Particular difficulties will likely be seen in the areas of overseas investment and construction.

Table 4. Impact on Korean exports of services (123 nations restricting entry from Korea as of March 12, 2020)

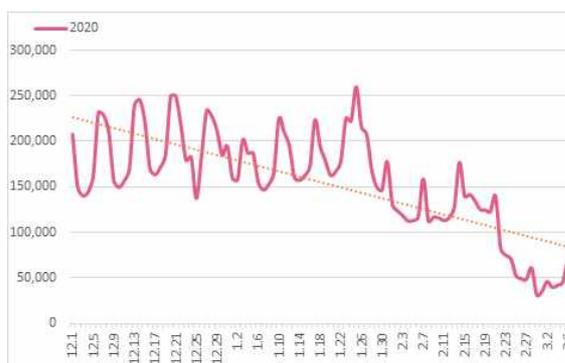
	Services Trade	Main Points
Major Effects	Transportation (flight)	- Visitors entering Incheon Airport in FEB 2020: Hong Kong (-75.6%), China (-54.1%), Japan (-50.5%) (YoY) - Earnings for airlines traveling to/from Korea 1Q 2020 -US\$ 1.1-1.2 billion (estimated)
	Travel (tourism)	- 2019 tourism earnings: US\$ 21.51 billion (total of foreign tourists to Korea: 17.5 million) - Entry into all Korean airports in FEB 2020: -45.1% (YoY) - Related domestic industries: distribution/manufacturing of main shopping items, hotel/lodging, restaurant businesses, passenger transport, travel agencies/guiding services, etc.
	Medical (foreign patients)	- Foreign patients visiting Korea for treatment in 2018: approx. 380,000 (Chinese 31.2%, US 11.9%, Japan 11.2%, etc.) * Internal medicine (19.4%), cosmetic surgery (14.4%), dermatology (13.7%), physical exams (8.9%)
Additional Effects	Foreign students	Foreign students studying in Korea in 2019: approx. 160,000 (Chinese 44.4%, Vietnamese 23.4%, etc.)
	Movement of service providers (Mode 4)	- Expansion of entry-restrictive measures likely to obstruct supply of professional services overseas * Professional services provided overseas mainly through overseas subsidiaries of Korean firms or Korean businesses established overseas.

Source: Data and material provided by the Korea Airports Corporation; Incheon International Airport Corporation; Korea Tourism Organization; Ministry of Culture, Sports and Tourism; Ministry of Education; International Civil Aviation Organization (ICAO)

4. Domestic Consumption

- Consumer anxiety resulting from the spread of COVID-19 is materializing in the form of consumers remaining home and consumer confidence falling.
- Fall in domestic travel resulting from efforts to contain spread of COVID-19 through avoidance of crowded areas/facilities (KTX high-speed train users fell by 50% from previous month in February 2020, passengers on domestic flights fell by 43.3% YoY)

Figure 3. Daily KTX passengers



Source: Korea Rail Road Corporation.

Figure 4. Domestic airline passengers



Source: Korea Airports Corporation flight statistics.

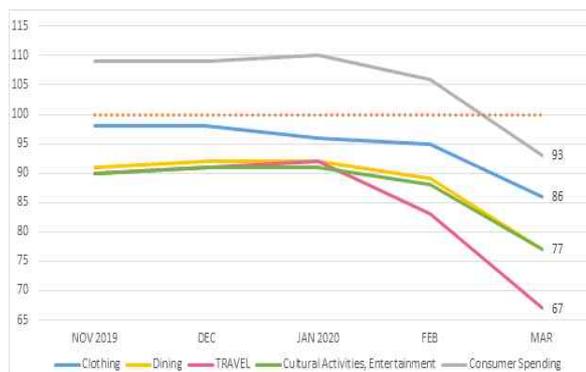
- Consumer composite sentiment index fell by 18.5 points from the previous month in March 2020, recording 78.4 with COVID-19 in rapid spread, thus adding to negative forecasts on the economic situation and future business prospects (Bank of Korea Consumer Survey).
- o Drop in consumer spending forecast for February 2020 (from previous month) observed, with spending on cultural activities, entertainment, travel, dining, clothing all predicted to fall (i.e. spending that involves crowded public facilities).

Figure 5. Consumer composite sentiment index



Source: Bank of Korea Consumer Survey.

Figure 6. Expenditure forecast by item



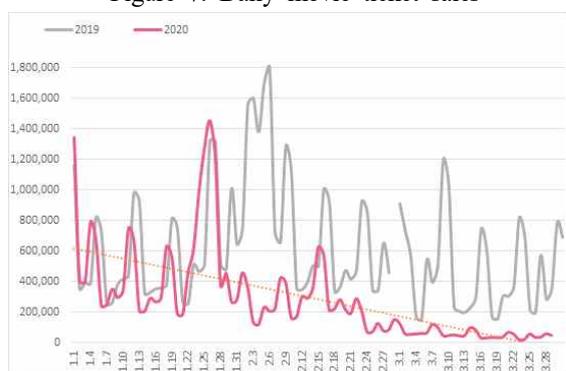
Source: Bank of Korea Consumer Survey.

■ **Consumers** Consumers are spending more time at home or indoors and this is naturally raising the proportion of goods and services consumed through e-commerce.

- Ticket sales in March at public theaters recorded a drop in both year-on-year (-87%) and month-on-month terms (-61%), while the use of Internet-based television services (OTT, VOD) in February increased year-on-year (34%) and month-on-month (16%).
- Online and non-face-to-face transactions all increased, partly offsetting fall in offline consumption.

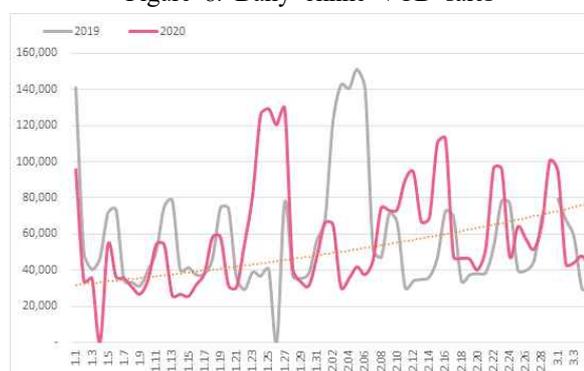
- An analysis of data released by Korean e-commerce services Gmarket and Auction, for the period of January 20 to March 3, 2020, show year-on-year increases in sales of health products (595%), basic necessities (41%), food (21%), while travel (-57%) and ticket (-77%) sales fell (eBay Korea, March 2020).
- E-commerce statistics released by Statistics Korea for February 2020 show year-on-year increases in overall online sales (34.3%), especially increase in food (92.5%) and household items (44.5%), while there were decreases in offline sales of department stores (-21.4%) and supermarkets (-10.6%). (Press release by Statistics Korea on March 30, 2020).

Figure 7. Daily movie ticket sales



Source: Korea Box Office Information System (KOBIS), Korean Film Commission

Figure 8. Daily online VOD sales

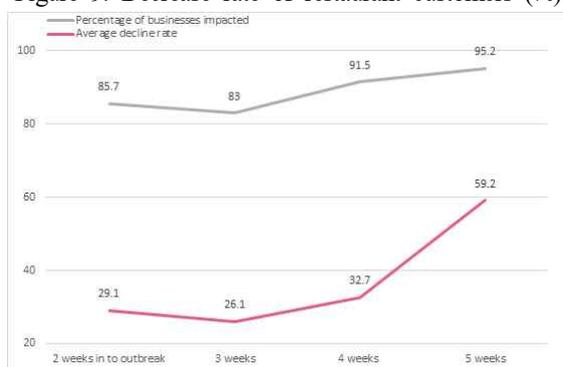


Source: Korea Box Office Information System (KOBIS), Korean Film Commission

■ **Small Merchants and Businesses** Changes in consumer behavior are having a different impact on small merchants and firms by industry.

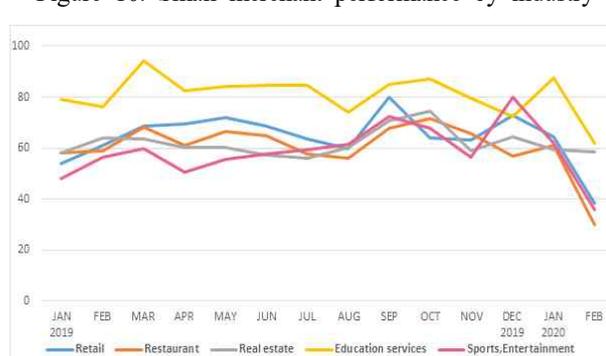
- Deteriorating consumer confidence is leading to actual decline in the offline sectors of dining and retail. Small merchants and businesses in the areas of restaurant services, lodging, wholesale and retail, travel and leisure are showing particularly harsh results according to key indicators for the month of February.

Figure 9. Decrease rate of restaurant customers (%)



Source: Monitoring data of impact on food service industry, released by Korea Foodservice Industry Research Institute.

Figure 10. Small merchant performance by industry



Source: Market business survey data for small merchants, released by the Ministry of SMEs and Startups.

- In February 2020, the business survey index reported by small merchants was 41.5 and sales performance was 40, down by 25.8 and 25.9 points, respectively, from the previous month.
 - The business sentiment index recorded a sharp drop in the sectors of retail, restaurant businesses, sports and entertainment services (according to market business survey data for small merchants, released by the Ministry of SMEs and Startups), and these sectors generated the most inquiries regarding fund support provided by the government (March 5, 2020 press statement by the Financial Services Commission).
 - Both the spending forecast index reported for consumers and business forecast index of firms fell from previous month levels, indicating that recession caused by COVID-19 will continue into the foreseeable future.
 - Both the Purchasing Manager's Index (PMI) and Output Index recorded their largest falls since June 2015 (March 2, 2020, IHS Markit).
- The decline in domestic demand and labor supply due to the spread of COVID-19, together with the contraction in overseas demand and travel restrictions posed by worldwide transmission of the virus, is expected to exert a negative impact on the Korean economy conveyed through global value chains.

Table 5. Impact of international spread of COVID-19 on domestic businesses

Indicators for domestic production	<ul style="list-style-type: none"> - FEB 2020 Purchasing Managers' Index (PMI) in manufacturing sector -1.1 (MoM) - FEB 2020 Output Index in manufacturing sector -5.7 (MoM)
Indicators related to economic forecast	<ul style="list-style-type: none"> - MAR 2020 Consumer Confidence Index (CCI) -18.5 (MoM) - FEB 2020 Small Merchant Business Survey Index -25.8 (MoM) - FEB 2020 Business Forecast Index for manufacturing sector -8 (MoM)

Source: Compiled from data and material provided by the Financial Services Commission, Bank of Korea, and IHS Markit.