Ministry of Education and Science of Ukraine

Ukrainian-American Concordia University
Department of International Economic Relations, Business & Management

Bachelor's Qualification Work

Digitalization in the management system of the international activity of the enterprise in the conditions of the COVID-19 pandemic

(On the basis of _____)

Bachelor's student of
Field of Study 07 – Management and Administration
Specialty 073 – Management
Educ. program – Management

Jongwha Han
(*First Name, Last Name)*
_____
(signature)

Research supervisor

Syerova Lyudmila
(*First Name, Last Name)*
Doctor of Philosophy
(Academic degree, full name)
_____
(signature)

Kyiv – 2022

Abstract:

The modern business world is multi-faceted and ever changing, bringing along new economic benefits and opportunities as well as risks and challenges. We currently live in an extremely globalized world, that has turned the global business model into one big interdependent system that allows close-knitted communication and international trade everywhere. Globalization has had a massive snowball effect on almost every area of our lives and, of course, it has also changed the business industry as well. All the accumulated and recent trends of economic globalization have established new ways of business development. This work deeply analyses globalization from a theoretical perspective, looks at ways economic globalization has impacted business development, studies company competitiveness and suggests ways of business enhancement in the framework of economic globalization.

Keywords: globalization, economic globalization, business development, business improvement.

Сучасний світ бізнесу багатогранний і постійно змінюється, він привносить нові економічні вигоди і можливості, але в той же час ризики і проблеми. В даний час ми живемо в надзвичайно глобалізованому світі, який перетворив глобальну бізнес-модель в одну велику взаємозалежних систему, яка забезпечує тісний зв'язок і міжнародну торгівлю всюди. Глобалізація зробила величезний вплив майже на всі сфери нашого життя і, звичайно ж, вона також змінила бізнес-індустрію. Всі накопичені і останні тенденції економічної глобалізації створили нові шляхи розвитку бізнесу. Ця робота глибоко аналізує глобалізацію з теоретичної точки зору, розглядає, як економічна глобалізація вплинула на розвиток бізнесу, вивчає конкурентоспроможність компаній і пропонує шляхи поліпшення бізнесу в рамках економічної глобалізації.

Ключові слова: глобалізація, економічна глобалізація, розвиток бізнесу, поліпшення бізнесу.

Современный мир бизнеса многогранен и постоянно меняется, принося новые экономические выгоды и возможности, но в то же время риски и проблемы. В настоящее время мы живем в чрезвычайно глобализированном мире, который превратил глобальную бизнес-модель в одну большую взаимозависимую систему, которая обеспечивает тесную связь и международную торговлю повсюду. Глобализация оказала огромное влияние почти на все сферы нашей жизни и, конечно же, она также изменила бизнес-индустрию. Все накопленные и последние тенденции экономической глобализации создали новые пути развития бизнеса. Эта работа глубоко анализирует глобализацию с теоретической точки зрения, рассматривает, как экономическая глобализация повлияла на развитие бизнеса, изучает конкурентоспособность компаний и предлагает пути улучшения бизнеса в рамках экономической глобализации.

Ключевые слова: глобализация, экономическая глобализация, развитие бизнеса, улучшение бизнеса.

APPROVED
Prescript of Ministry of Education and Science, Youth and Sports of Ukraine
29 March 2012 № 384

Template № H-9.01

PHEE-institute «Ukrainian-American Concordia University»

Faculty of management and business
Department of international economic relations, business and management

Educational level: **bachelor degree**
Specialty: 073 "Management"
Educational Program "Management"

APPROVED
Head of Department _____

_____
"____" _____202___

TASK
FOR BACHELOR'S QUALIFICATION WORK

Jongwha Han
(Name, Surname)

1. Topic of the work

Digitalization in the management system of the international activity of the enterprise in the conditions of the COVID-19 pandemic

Supervisor of the work_____,
(surname, name, degree, academic rank)

Which approved by Order of University from ***"22" December 2022 №22-12/2022- 3c***

2. Deadline for bachelor's qualification work submission "***16" May 2022***

3. Data-out to the bachelor's qualification work_____
to the bachelor thesis materials received during the consultation with the representatives of the company

4. Contents of the explanatory note (list of issues to be developed)
There are three main topics/tasks for the thesis: theoretical and methodical bases of digitalization; research of the organizational and economic mechanism of digitalization of the international activity of the enterprise in the conditions of the COVID-19 pandemic; development of measures to improve the high-tech technologies management of the enterprise.

5. List of graphic material (with exact indication of any mandatory drawings)

Graph for illustrating the dynamic of financial indicators of the company activity and schemes for visualization the international organization management system of the company.

_____6. Consultants for parts of the work

Part of the project	Surname, name, position	Signature, date	
		Given	Accepted
1	***Syerova***		
2	***Syerova***		
3	***Syerova***		

7. Date of issue of the assignment

Time Schedule

№	The title of the parts of the bachelor's qualification work	Deadlines	Notes
1.	I chapter	*14.02-13.03.2022*	*Done*
2.	II chapter	*14.03-10.04.2022*	*Done*
3.	III chapter	*11.04-24.04.2022*	*Done*
4.	Introduction, conclusions, summary	*25.04 – 01.05.2022*	*Done*
5.	Pre-defense	*06.06.2022*	*Done*

Student_____

Supervisor_____
(signature)

Conclusions:_____

The bachelor thesis of Jongwha Han is relevant and devoted to high-tech technologies management. The reviewed bachelor thesis consists of content, introduction, 3 sections, conclusions, and recommendations. The content of the paragraphs is fully complied with the parts' titles and the topic of the bachelor thesis. The content and structure of the work meet the requirements and current standards for obtaining an educational bachelor's degree. Illustrative materials facilitate the perception of presented information and indicate persistence in the collection and processing (analyzing) of statistical data. The practical significance of this bachelor thesis is proved by the opportunity of using of a proposed improving set of measures on the company. Proposed recommendations will increase the efficiency of the management system of the company. The bachelor thesis is a completely independent study of current theoretical and practical aspects of management. The bachelor thesis of Jongwha Han is recommended for defense with a high score.

Supervisor_____

(signature)

CONTENT

Introduction

Due to the COVID-19 incident in early 2020, the world faced a serious crisis and structural changes in economic and social aspects, experiencing unexpected demand and supply shocks at the same time. Korea's economic growth rate in 2020 was -1.0% after Taiwan (3.1%), Vietnam (2.9%), China (2.3%), and Norway (-0.8%) while the global economy shrank by 3.3% in 2020. Korea suffered its first economic recession since the 1998 economic crisis (-5.5%) but minimized economic shocks in response to the COVID-19 pandemic relatively quickly and effectively compared to major global advanced countries such as the United States, Japan, and the United Kingdom.

As a result, Korea's gross domestic product (GDP) reached $1.6309 trillion in 2020, up two notches from the previous year in the global economy, ranking 10th in the global economy.

In April 2021, the IMF predicted that Korea's economic growth rate in 2021 was 3.6%, lower than that of advanced countries (5.1%) and G7 (the United States, Britain, Fran[1]ce, Germany, Italy, Canada, and Japan 5.4%). However, Korea's average growth rate between 2021 and 2022, when the base effect of reverse growth was removed due to the influence of COVID-19, is expected to be 1.3%, exceeding advanced countries (0.2%), euro (1.1%), and G7 (0.2%). As such, Korea is evaluated as a leading country that has recovered its economy the fastest and most flexibly while minimizing the impact of COVID-19.

As non-face-to-face and non-contact become commonplace due to the spread of COVID-19, management and consumption behaviors change, emphasizing the importance of non-face-to-face and digitalization to overcome the economic crisis. Major IT companies and global leading companies are already aware of the importance and necessity and are promoting digital transformation through the introduction of non-face-to-face SW through the enterprise-wide introduction. However, contrary to this global trend of change, some small

---

[1] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

and medium-sized enterprises and vulnerable groups in Korea are having difficulty preparing for digital transformation

According to an opinion survey conducted by the Incheon Chamber of Commerce (20.6), which is a non-face-to-face business introduction company, about 70% of the respondents said that it is necessary to introduce non-face-to-face business methods, but they said that equipment, use, and capacity education are necessary. At the government level, it is necessary to promote the improvement of awareness of the importance of digital transformation and changes in the work environment[2], and to expand corporate support through digital new deal and various support programs. Major domestic SW companies are also expanding their business capabilities based on increased domestic demand due to COVID-19, but they are also having difficulty securing shares in the domestic market[3]

According to a survey conducted by the Korea Industrial Technology Promotion Association (20.4), if 7 out of 10 domestic companies use foreign products and global companies' platformization strategies accelerate, domestic demand companies and users may lock in overseas products and services and fail to secure technologies and markets in the future. Along with efforts to develop non-face-to-face SW technology and service advancement in the general-purpose business area, it is necessary to create new markets and preoccupy markets by developing non-face-to-face SW in specialized business areas linked to domestic promising and regional industries, and digital transformation of companies has become an essential strategy.

From large companies to small and medium-sized enterprises to small businesses, regardless of their business type, size, and role, it was required to establish a flexible and resilient non-face-to-face cooperative system through digital transformation. (*Non-face-to-face SW trend for digital transformation of enterprises (nsbaek@nipa.kr) and senior Lee Soo-

---

[2] Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

[3] Non-face-to-face SW Trends for Corporate Digital Transformation Senior Director Nam-seok Paik (nsbaek@nipa.kr) and Senior Director Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team at SW Industry Headquarters

jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters).

The topic of the final qualifying paper is «Digitalization in the management system of the international activity of the enterprise in the conditions of the COVID-19 pandemic"

The relevance of the chosen topic is that enterprises, while conducting their operational activities, are exposed to the influence of different factors and phenomena of internal and external nature, impacting organizations as a whole system, as well as its individual aspects. These factors and phenomena may cause uncertainty and insecurity, which create difficulties and obstacles to the fulfillment of corporate internal, annual, change, etc. objectives. In the context of environmental changes, digitalization management becomes a constant activity of any enterprise, therefore, the correct assessment of the situation and the choice of the management method, aimed at reducing risk are very important issues in achieving economic goals and the desired result.

The object of research is the management system of a company.

The subject of research is the management of digitalization in the management system of the international activity of the enterprise in the conditions of the COVID-19 pandemic.

The purpose of the final qualifying paper is the perfection of the management system of digitalization in the management system of the international activity of the enterprise in the conditions of the COVID-19 pandemic.

To achieve this purpose, it is necessary to complete the following **assignments**:

1) to give the organizational and economic characteristics of the transform industrial paradigm and transform ecosystem in the context of digitalization;
2) to analyze management system of the digitalization specifics of covid-19 corporate response regarding high-tech technologies management;
3) to assess the implementation of fast digitalization execution in overcoming the crisis of korean companies;
4) to develop substantiations and guidelines for improvement of customer experience of digitalization;
5) to investigate prospects for new reality of digitalization of Korean companies.

The set purpose and assignments determined the structure of the final qualifying paper:

- Chapter 1. Bases of digitalization in the management system of the international activity of the enterprise in the conditions of the covid-19 pandemic;
- Chapter 2. Investigation of digitalization overcoming the crisis of korean companies;
- Chapter 3. Opportunities for improvement of high-tech technologies management of Korean companies

Methodology of final qualifying paper: observation methods (for collection of the initial information for analysis), analysis of company's commitments implementation, statistical methods, analysis of the existing risk management system, analysis of the assessment of risks, statistical methods, expert survey methods (for identification and assessment of risks), scenario modeling, graphic method.

CHAPTER 1. BASES OF DIGITALIZATION IN THE MANAGEMENT SYSTEM OF THE INTERNATIONAL ACTIVITY OF THE ENTERPRISE IN THE CONDITIONS OF THE COVID-19 PANDEMIC

1.1 Korea's Evaluation of Overcoming the COVID-19 Crisis

Korea's exports are better than major exporters, leading the economic recovery

Korea was able to maintain a low infection rate through effective quarantine systems such as sound economic fundamentals and tracking infection routes using digital infrastructure and technolog[4]y. As a result, the domestic economy recovered in the second half of 2020 as exports and other private sector economic activities improved after the third quarter of 2020. As countries around the world implemented a strong shutdown policy due to the COVID-19 pandemic, global exports fell 7.2% year-on-year to $17.3 trillion in 2020. Among them, Korea's exports fell 4.4% year-on-year, but compared to the U.S. (12.8%), Germany (-7.3%), and Japan (-9.2%), including the decline rate of the top 20 global exporters, Korea responded quickly to internal and external shocks.

According to a press release from the Ministry of Trade, Industry and Energy (2021.1.1), despite a decline in global trade, Korea's total exports surpassed $500 billion for the fourth consecutive year, and its trade surplus in 2020 increased 17.3% year-on-year to 12 years. This is because domestic semiconductors, biohealth, computers, and secondary batteries, which have been continuously fostered as new growth industries due to the spread of digital and non-face-to-face since COVID-19, led export growth. Exports of semiconductors ($99.18 billion), the nation's largest flagship product, led Korea's exports by 5.6% year-on-year, with biohealth (54.4%), computers (57.2%), agricultural and fisheries food (4.5%), cosmetics (15.7%) and secondary batteries (1.3%) showing high export growth rates.

Differentiation patterns by domestic companies and industries are clear, but

---

[4] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

performance is higher than that of global companies

In the early days of the COVID-19 pandemic, both domestic and foreign companies were concerned about poor performance and insolvency due to disruptions in parts procurement due to the collapse of the global supply chain, shrinking global trade and falling domestic demand. However, domestic companies have relatively quickly recovered from the management crisis by responding to it based on their efforts to survive and their ability to cope with the crisis quickly, and overall performance is not considered to have shrunk significantly. In addition, domestic companies showed their competitiveness, focusing on industries benefiting from COVID-19, such as non-face-to-face and medical care, and faced new opportunities for growth.

Consolidated sales (1,961 trillion won) of KOSPI companies (a total of 597 companies excluding the financial industry) fell 3.70% year-on-year in 2020, while consolidated operating profit (107.4 trillion won) and net profit (63.5 trillion won) increased 3.20% and 18.15%, respectively. The improvement in operating profit and net profit compared to the decrease in sales is largely interpreted as the result of the company's self-help efforts, such as cost reduction. In addition, sales of KOSDAQ companies (197.1 trillion won) rose 3.44% year-on-year, and operating profit (11.4 trillion won) and net profit (7.8 trillion won) rose 12.1% and 3.97%, respectively.

It is also characterized by a distinct division of light and shade by industry due to the COVID-19 crisis. In the KOSPI market, both sales and net profit increased year-on-year in the pharmaceutical, finance, medical precision, food and beverage, electrical and electronics and telecommunications industries, while both sales and net profit fell significantly. There is also a gap between these industries in the KOSDAQ market, where both sales and net profit increased in industries such as fi[5]nance, semiconductor, distribution, digital content, and

[5] Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

software, while both sales and net profit decreased in entertainment, culture, accommodation, and food.

Comparing domestic and foreign companies' earnings through Earnings Per Share (EPS) of major stock indexes, EPS has fallen since the first quarter of 2020 when a strong shutdown took place worldwide, differentiating the recovery trend through the second and third quarters. Even after the third quarter of 2020, companies such as France and the United Kingdom showed poor recovery, while Korea, Taiwan, and China recovered relatively little and quickly. The EPS of Korea's KOSPI market fell 16.9% to the mid-80s in the second quarter of 2020, which is good compared to the UK (91.7%), Germany (66.4%), and Japan (40.5%) after Taiwan (5.1%) and Shanghai (9.4%). In addition, at the end of the fourth quarter of 2020, Korea's KOSPI EPS index was 116.6, the second highest after Taiwan (126.7). In other words, the performance shock of domestic companies is better than that of other countries, and recovery is also taking place rapidly.

After spreading global stock market plummeted 19 of the COVID around the world, the major stock market has a different recovery. Global investment sentiment shrank sharply due to the pandemic declaration, and the global stock index, including Korea, fell sharply between March and April 2020, but since then, the recovery pattern varies depending on individual countries' economic fundamentals and quarantine systems, real economic shock levels, and the size of each country's policy response. Looking at the year-end stock price return of 28 major global stock indexes compared to the beginning of 2020, there are 15 major stock indexes that recovered their stock prices at the beginning of the year, including the Korea KOSPI.

Among them, Korea's stock price return was 32.1%, the second highest after the U.S. NASDAQ (41.8%), China's Shanghai Index (25.5%), Taiwan's household index (21.8%), Japan's Nikkei (18.3%), Vietnam's Ho Chi Minh (14.2%), and New Zealand (10.6%) showed high resilience. Meanwhile, the basis for the recovery of the stock market is largely due to the liquidity supply of governments after COVID-19, and concerns over the possibility of a

bubble in the stock market are also rising. Looking at the Buffett Index (market capitalization/GDP of the country), which usually indicates whether the stock market is overheating, the U.S., Korea, China, and Japan are countries whose Buffett Index has risen compared to before COVID-19, while Germany, Italy, and the U.K. have fallen.

Looking at PER (Price Earnings Ratio) and PBR (Price Book Value Ratio) as indicators of the degree of a company's valuation, domestic and foreign market participants' expectations for performance, growth, and book value have increased since the COVID-19 incident. However, it is still difficult to say that it was highly evaluated due to its low valuation index compared to global. First, the PER of Korea's KOSPI-listed companies increased by 61.9% from 18.2 times at the end of 2019 to 29.5 times at the end of 2020, similar to the PER (29.4 times) of US S&P. However, during the same period, NASDAQ's PER increased by 81.2% from 44.0 times to 79.8 times, with the highest growth rate and absolute value.

Considering that major [6]companies constituting NASDAQ belong to the ICT industry with high growth potential, the increase in PER of domestic companies also suggests that investors have been reevaluated for the future growth of domestic companies to some domestic companies. Second, domestic companies' PBR re[7]corded a global low of 0.89 times at the end of 2019, but increased by 30.3% to 1.16 times at the end of 2020. However, the absolute value is still lower than that of the U.S. NASDAQ (6.27 times) and the U.S. S&P (4.14 times). This suggests that a strategy to increase capital efficiency in the mid- to long-term is needed because domestic major industries such as chemicals, machinery, and automobiles require large-scale capital.

In summary, the domestic stock market had high stability and resilience compared to the global market, and medicine exports and performance recovered rapidly, focusing on the

---

[6] Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

[7] Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

beneficiary industries such as the pharmaceutical, medical precision, and electrical and electronic industries. However, domestic companies need to enhance corporate value by improving capital efficiency.

Domestic Industries Toward Future Growth

Looking at the top 12 global stock market capitalization over the past 20 years, the industrial structure was reorganized around ICT (Information and Communication Technology), electric vehicle, and semiconductor industries, which run platform businesses, in 2000. Founded in 1975 and dominating the global software market, Apple, Amazon, and Facebook have been newly listed on the U.S. NASDAQ market since the 2000s, building an ecosystem as technology and platform companies in a changing industrial structure. Although high-value issues are emerging for some ICT companies' stock prices, unlike the past, investors continue to expect that intangible values such as technology, data, platforms, network effects, and brands will be competitive for future companies.

Korea is also transforming its industrial structure around new industries with high growth potential. Over the past 20 years, the composition of the top 12 domestic market cap companies has recently changed from telecommunications, electronics, steel, and financial industries to semiconductor, chemical, battery, bio, and IT industries. In addition, automobiles, the nation's main export, have consistently accounted for a large portion of the local stock market over the past 20 years. Considering Korea's export-oriented economic structure and the front-rear effects of manufacturing such as automobiles, it is necessary to secure global competitiveness through technology development and innovation by reflecting the changing industrial structure of the domestic manufacturing industry. A Positive Evaluation of Korea's Economy and Businesses Related to COVID-19

Korea showed a higher spread of COVID-19 than other countries in early 2020, but major foreign celebrities and media have continued to positively evaluate the rapid overcoming of this and promoting economic recovery. Microsoft founder Bill Gates evaluated

Korea's process of overcoming COVID-19 as a model for the w[8]orld, and at the Davos Agenda Week in January 2021, CEO of Pascal Sorio AstraZeneca and Chairman[9] Jim Snavezimens positively evaluated Korea's technology, crisis management, and future growth. The Wall Street Journal and Bloomberg commented in September and December 2020, respectively, that Korea overcame the COVID-19 crisis without a full shutdown due to digital infrastructure using advanced technologies such as infection route tracking and notification systems.

Meanwhile, the IMF analyzed in a report in April 2021 that Korea's sound macroeconomic fundamentals and policy responses contributed to easing the COVID-19 shock, and active online economic activities led to a rebound in exports and expanded corporate investment. Meanwhile, the report suggested that tasks such as digital transformation, increased inclusion, easing barriers to entry into businesses, promoting innovation and shifting to a low-carbon economy should be addressed to enhance the growth potential of the Korean economy.

1.2 Transform Industrial Paradigm and Transform Ecosystem in the context of digitalization

Structure of Economic Development from Industrialization to Digitalization

In order for the entire global economy to grow, a new growth engine is needed to succeed "industrialization" so far, and that is "digitalization." Developed countries in[10] the 20th century, including the United States, the United Kingdom, Germany, France, and Japan, are all struggling with low growth rates of 1 to 2%, and the cycle of economic growth due to traditional "industrialization" is ending their lives. In the 21st century, while major developed countries have not achieved economic growth, only the United States, which succeeded in

[8] Non-face-to-face SW Trends for Corporate Digital Transformation Senior Director Nam-seok Paik (nsbaek@nipa.kr) and Senior Director Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team at SW Industry Headquarters

[10] The Digital Transformation and Implications of the KIET Industrial Economy Analysis for COVID-19 Response

"digitalizing" before other countries, is continuously growing. As of 2020, the top five companies in the U.S., Apple, Google, Microsoft, Amazon, and Facebook, are the world's top digital companies.

The future of the 21st century depends on a new S-curve called 'digital', and how quickly one can break away from the convention of industrialization of the past to become an advanced country in the 21st century.

Destruction for the future. And COVID-19

As a result of industrialization, the gap between the rich and the poor has widened and developed countries have fallen into a trap of low growth, and among them, low-income people are facing life and death problems, especially amid the widening gap between the poor and the poor. Companies that have reduced their equity ratios using asset liquidity and treasury stock purchases to maximize their investment return (ROIC) are facing a crisis of bankruptcy. In addition, hospitals and power companies whose publicity has disappeared due to privatization lack a role as public goods, and Supply Chain Management, which replaced manufacturing, has been neutralized by border closures.

Efforts to return to life before the outbreak of COVID-19 and return the economic and social systems to the past may be the right direction, but from a more fundamental point of view, the system of the 20th century was ending its life. The direction of overcoming the current crisis should be to build a new future, not to return to the past, and to create a system suitable for the new century beyond the limitation[11]s of the old system of the past. Companies have also begun to worry about responding with new business models in a changing market environment, and are focusing on digitalization.

The digitalization of governments and organizations is called the term "digital

---

[11] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

transformation." If the egg called digital hatched during the 3rd Industrial Revolution and the period from the late 1990s to 2020 is the period when digital grew as a caterpillar (=the 4th Industrial Revolution), it can be seen that the COVID-19 period of WFH is a pupa situation that cannot move in cocoon. In the meantime, it depends on what you do now whether you will finish your metamorphosis and fly away as a wonderful butterfly or return to the caterpillar.

What should Korea do?

As an IT powerhouse, it is very advantageous for Korea, which has the most core capabilities required for the new digital world now, that the topic of the future is "digital." It would not be an exaggeration to say that Korea is the world's best in terms of a comprehensive balance from software to hardware to semiconductors.

Digital Transformation of Industrial Structure

In the past, Korea's industrial portfolio was centered on large companies from the perspective of export-oriented economic growth and service-oriented domestic demand. On the contrary, most of the recent development of start-ups is focused on domestic service industries. As a result, even the leading manufacturer, the automobile industry, has overtaken the market capitalization of all existing companies that have been protecting the automobile industry for more than 100 years.

Perhaps, the competitiveness of large manufacturing companies that have succeeded in the traditional industrialization period is now likely to become meaningless. Now, the biggest challenge will be how to transform these companies into companies suitable for the digitalized world, and how to foster new companies to replace them. At the same time, a fundamental change is needed in the perspective of dismissing the service industry as a domestic industry. Most of the global companies with large market capitalization in the U.S. (excluding Apple, Microsoft, Amazon, Google, and Facebook) are all companies that were classified as service industries in the existing industrial world. Another important task is whether to change the

domestic-oriented service industry to suit the digitalized wo[12]rld.

Our country has excellent capabilities for digital, but ironically, it is also obsessed with industrialization-oriented thinking. Korea still has a strong experience of success, relatively recently, in a short period of time, and the memory of the IMF and financial crisis has created an attitude of trying to restore the original state like a conditional reflex when a crisis hits.

In the process of digital transformation, many manufacturing/chaebol companies, which are now important pillars of the Korean economy, will face a crisis. The argument that these collapsing companies should be saved by injecting large-scale public funds will be loud, but this is not the right direction. It is necessary to take a cool look at the future of industries, and even if it is an industry that Korea has done well so far, it will have to determine whether the industry will be worthwhile in a digital world that really changes its edition.

It is necessary to increase Korea's share in the global ecosystem in new industries. Since Korea has never made new rules for games, its strategy for new industries often considers how to make money simply as a player who has to play in the stadium rather than making the most money in the new market. It is not just the national team tha[13]t makes money, but it is necessary to comprehensively consider whether Korean companies will sell uniforms, sneakers, build training camps to make foreign players come, youth education in Korea, and standard discussions. If you want to run ahead of the current situation, which requires a completely new version, you need to deliberately think about ways to foster competitiveness comprehensively from the perspective of the entire ecosystem of the industry, whether hydrogen-filled or blockchain.

The financial industry is the most important infrastructure industry for all companies

---

[12] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

[13] Beyond COVID-19 in the Equinix 2020-21 Global Technology Trends Survey: Digital Transformation Trends After Pandemic

and industries to be newly created and grown, and there is no innovation that can be made without adequate funding. After the IMF, the financial industry's function as a role in attracting money to the industry has been greatly damaged, with corporate finance-oriented banks shrinking and remaining banks focusing on personal finance-oriented businesses centered on real estate. Jonggeumsa, a leading player in venture capital, has disappeared, and remaining savings banks and capital firms have not functioned much in the government's policy of only focusing on risk management. Its role as industrial finance is now entirely up to the government, and the collapsing chaebol group is headed by the state-run Korea Development Bank, which takes the lead in solving everything, and fostering new growing startups is returning to VCs who received government money. It seems necessary to change the direction so that the private sector can play the role of proper industrial finance, and properly lay the foundation for the surplus market funds to grow new industries, not real estate or listed stock markets.

A transformation of the social structure

The role of government will become increasingly important in times of turmoil resulting from rapid change, especially when it comes to fundamental considerations about how to circulate and distribute wealth in society. New digital industries may not require many jobs, unlike traditional manufacturing, and may be a structure in which a small number of geniuses create most values. In a situation where the polarization of wealth is intensifying, the characteristics of the digital industry are likely to make the problem more serious. With a small number of companies and manpower creating considerable value for the national economy, all citizens should consider distributing wealth that can maximize happiness. From the perspective of the overall national economy, it is necessary to think about where[14] wealth is created and how it should be distributed, and the government should focus on resolving the enormous conflicts and noise that may arise in the process.

---

[14] The Digital Transformation and Implications of the KIET Industrial Economy Analysis for COVID-19 Response

An immediate response

Clear guidelines should be established to discuss which industries should survive, which should be created, and which industries will inevitably disappear in terms of future national competitiveness. Currently, there is a huge amount of liquidity in the market, but on the other side, there are companies collapsing due to COVID-19, and there are digital companies that need to be nurtured for innovation. Policy considerations are needed to convert real estate, listed stock markets, and capital driven by overseas stock investment into funds for digital transformation. It is necessary to create appropriate financial businesses and adjust the tax system to lower the attractiveness of listed stocks and overseas stock investments, increase the attractiveness of investments invested in corporate funds.

There is still a lot of discussion on the distribution of wealth at the national level suitable for the future social and economic systems, but an immediate response is needed at a time when many people's livelihoods are threatened. Various attempts will be made, but it will be necessary to create a meticulous monitoring process for the process and results. Korea has accumulated the capabilities that best suit the future of digital, and unlike advanced countries that have already entered a recession at the end of industrialization, its dynamic as a growing chaser is st[15]ill alive. Moreover, in the COVID-19 crisis, Korea is responding better to COVID-19 than any other advanced country.

While Korean companies have shown results in overcoming the COVID-19 pandemic crisis, they have been performing well so far, but it is not easy to achieve sustainable growth if they are complacent. This is the era of the 4th industrial revolution, and the game itself has changed from the period of the 1st industrial revolution in the 18th century, the 2nd industrial revolution in the 19th to 20th centuries, and the 3rd industrial revolution in the late 20th century.

In the era of the 4th Industrial Revolution, which combines artificial intelligence (AI)

---

[15] Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

and data & analytics (D&A), new businesses, new products, and new services are emerging based on technological innovation. With the emergence of services that break down the boundaries between industries and cross sectors, Korean companies face challenges every day to adapt to the global environment faster and create new industries.

In the transformation of the industrial ecosystem that combines technology based on the 4th Industrial Revolution, it is up to corporate decision-making at this moment whether to passively accept paradigm changes in various areas or take the lead in paradigm shift.[16]

First Industrial Revolution (18th century): Steam engine-based mechanization revolution

Second Industrial Revolution (early 19th and early 20th centuries): A mass production revolution based on electrical energy

Third Industrial Revolution (late 20th century): Computer and Internet-based Knowledge Information Revolution

In the 3rd industrial revolution, the 4th industrial revolution began as artificial intelligence machine learning deep learning big data IoT clouds were added and developed.

4th Industrial Revolution (early 21st century): Smart Factory, Self-driving, Digital Healthcare, Fintech, Retail Tech

1.3 Digitalization Specifics of COVID-19 Corporate Response regarding high-tech Technologies management

COVID-19 and the impact of the mobility industry

The movement of people decreased significantly due to closed policies, social distancing, and telecommuting, which had a great impact on the overall mobility industry as a whole. In addition, the overall decline in automobile demand has hit the automobile and parts industries, and the sharing service industry has also been hit hard. Shared service companies

[16] Viva Republica, Comprehensive Press Releases

are making efforts to clean and manage services to re-expand services in the future. Recently, the demand for personal mobility such as bicycles and electric kickboards and the use of robots for non-face-to-fa[17]ce delivery are also increasing.

The impact and change of COVID-19 can be seen in various aspects such as the situation of each country, the movement of people and things, automakers, and service companies. In Korea, the situation is relatively better than in other countries, and delivery is increasing, and service companies are receiving attention in that they responded better than automakers.

Increased delivery and reduced user mobility services

User transportation services such as ride sharing, vehicle sharing, and rental cars were hit hard, and automakers that were promoting user transportation services also suffered heavy losses. U.S. car-sharing company Zipcar laid off 20 percent of its workforce, while Uber and Lyft also laid off 14 percent and 17 percent of its workforce in May, respectively. Hertz, a rental car company, filed for bankruptcy protection in May, which is analyzed to have been hit hard by a drop in aviation demand as the airport-linked rental car business became the center. GM has suspended its shared vehicle service Maven, and an article has been published that the joint service Your Now 53 service between Mercedes-Benz and BMW is in negotiations to sell some of Your Now's companies in October 2020 due to poor performance. Park Now, a parking service, and Moovell, 54, which used to occupy an important position in the former Mercedes-Benz mobility service, appeared articles mentioning the possibility of a sale.

Delivery services have increased significantly, and major delivery-related companies such as Amazon, Wal-Mart, and Instacart have significantly increased hiring of employees due to increased delivery demand. Amazon announced plans to hire 100,000 emplo[18]yees in March

---

[17] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

[18] Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

and 75,000 in April. According to the New York Times, Amazon hired a total of 427,300 new employees from 2020 to October. In addition, it is expected that autonomous driving will be applied to product delivery and user movement by acquiring Jukse, an autonomous driving company, in June. Ride-sharing service companies such as Uber, Lyft, and Grab suffered from ride-sharing services, but made up for their losses by strengthening delivery services. Uber has launched product delivery services such as Uber Direct and Uber Connect. Lyft launched the Essential Delivery service and also collaborated with Amazon. Grab performed well by strengthening financial and delivery services in the COVID-19 situation, and expanded its online shopping malls to eight Southeast Asian countries in June. Given Amazon's acquisition of Juks and the strengthening of Uber, Lyft and Grab's delivery services, it is predicted that user mobile services and product delivery services may be combined in the future. Vision Urbanics, announced by Mercedes-Benz in 2018, is a concept car that can be converted into a bus for user movement during the day and a truck for object movement at night, and can replace indoor spaces on an autonomous driving platform.

Uber's net loss in the third quarter of 2020 was $1.09 billion, down from $1.16 billion in 2019, and although it cut about a quarter of its staff this year, Grab seems to have made up for its losses by strengthening delivery services, online sales rose 21% during the COVID-19 period, and overall revenue recovered to 95% before the COVID-19.

A blow to the automobile industry

Major automakers and related parts makers are experiencing a major crisis, such as reduced vehicle sales and difficulties in vehicle production as the movement decreases du[19]e to COVID-19 and the supply chain of parts collapses.

According to the Korea Automobile Manufacturers Association's announcement, the global auto plant operation rate is 29% as of April 16 due to the collapse of the parts supply

[19] Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

chain and the shutdown of the factory due to COVID-19. Hyundai Kia's plant operation rate was the highest at 64.7%, while Fiat-Chrysler (FCA), Daimler Benz, and GM recorded very low operation rates of 14.3%, 11.1%, and 10.5%, respectively, leading to a major crisis such as reduced vehicle sales and difficulties in vehicle production.

Mobility Market Conditions in Korea

Despite COVID-19, the mobility market in Korea is relatively good compared to other countries. The use of public transportation such as buses, subways, and taxis has decreased significantly, and the use of delivery services, bicycles, and electric kickboards has increased significantly. Compared to 2019, Korea's automobile sales increased by 10% in March, 6.5% in April, and 9.3% in May, showing a contrast to other countries where sales plunged. Automobile parts companies are suffering from a significant decrease in new orders from overseas automakers and a decrease in total sales of Korean automakers.

The number of passengers using public transportation has decreased significantly, but the traffic volume of cars has not decreased significantly. According to the Seoul M[20]etropolitan Government, in the first week of March and April 2020, the number of public transportation users decreased by 34.5% and 28.3%, respectively, compared to before COVID-19, and automobile traffic also decreased by 7.2% and 3.4%. The main reason seems to be the increase in the number of cars and avoiding public transportation in the face of increased telecommuting. In Korea, the use of rental cars and vehicle sharing increased during March and April, when COVID-19 was severe, showing a very different appearance from overseas. Green cars and Socar were reported to have increased their use by about 50 percent in March.

Meanwhile, Coupang's online payments in the first quarter rose 21% year-on-year to 4.84 trillion won, while CJ Logistics and Hanjin Shipping saw their operating profit increase 53.2% and 34.4% year-on-year, respectively, significantly increasing the online payments and usage rate of domestic delivery companies.

---

[20] The Digital Transformation and Implications of the KIET Industrial Economy Analysis for COVID-19 Response

Major countermeasures in the mobility industry following the COVID-19 outbreak

Mobility industries such as Hyundai, Ford, and market research institution Frost & Sullivan are proposing changes and countermeasures due to COVID-19. Major issues include reorganizing the supply chain of parts, strengthening clean services, strengthening online sales, improving delivery efficiency, activating mobility services after COVID-19, strengthening self-driving and self-driving delivery, and strengthening competitiveness of electric vehicles.

Automakers [21]are expected to strengthen their reshoring or near-shoring strategies in supplying parts. Therefore, it is expected to reduce the risk by strengthening the production of parts in Korea or nearby overseas and dispersing production bases. In the future, it is necessary to strengthen clean mobility directly affected by COVID-19. It is expected to create a safe vehicle from the virus by linking built-in cleaning materials or cleaning services.

In terms of mobility services, online sales and delivery services are becoming a major trend. If technology development and data analysis are carried out to streamline delivery and COVID-19 decreases, mobility services will be activated as a whole. It is expected to expand fault diagnosis and management services by linking online sales information with shared services and subscription services and linking production-sales-driving data. In addition, online sales are also connected to digital production, accelerating flexible production systems and factory automation to respond to small-volume production of multiple varieties, and expanding to personal transport and delivery vehicles through the production of various vehicles.

Initially, the commercialization of the third phase of self-driving was expected to take place in several countries in 2020, but self-driving vehicles for human movement are expected to be delayed a little due to a decrease in automakers' investment capacity due to COVID-19.

---

[21] Beyond COVID-19 in the Equinix 2020-21 Global Technology Trends Survey: Digital Transformation Trends After Pandemic

Therefore, investment in self-driving delivery is expected to be strengthened by activating delivery services. Meanwhile, in order to eliminate the user's distrust of shared vehicles, its own cleaning service is expected to be strengthened and fault diagnosis services will appear in various ways. In particular, the development of fault diagnosis services is expected to accelerate to strengthen shared services and subscription services.

Conclusions and Policy Recommendations

Mobility-related ind[22]ustries have been hit hard by COVID-19, but new industries such as delivery services are growing, and the automobile industry is also recovering. Despite COVID-19, Korea is expecting good performance in the post-COVID-19 market, showing relatively good performance. In the short term, it is urgent to provide support to auto parts makers suffering from COVID-19. In other aspects related to parts, it is necessary to strengthen the reshoring and near-shoring policies in consideration of automobile manufacturers that once had difficulties in production due to the supply and demand of parts. There is a need for policies to strengthen digital production for non-face-to-face and pre-investment support for autonomous driving and electric vehicles. In terms of services, investment is expected to be needed for the growth of user mobile services and delivery services.

In the long run, it is important to support auto parts and automakers' product conversion tailored to autonomous driving and electric vehicles. It is expected that existing auto parts makers, which have focused on internal combustion engines, will need support to change their constitution, focusing on electric vehicles and autonomous vehicles. In addition, mobility services and support for commercialization of autonomous driving through infrastructure support such as roads, buildings, and smart cities are also thought to be a good direction. Analyzing all data such as parts, production, sales, and driving, and linking

[22] The Digital Transformation and Implications of the KIET Industrial Economy Analysis for COVID-19 Response

management ser[23]vices such as fault diagnosis, used car management, and mobility services based on this, is also expected to be a direction for future food. Support and growth for startups with creative ideas are also needed. In addition, for the evolution and innovation of the system, it is necessary to think about the 'paradigm change in mobility 100 years', which is currently being considered in related industries. In line with the trend of change from automobiles to services, identifying and growing the mobile services that consumers want is expected to be the key to future evolution.

Short-term Policy Suggestions: Survival Strategies for Ecosystem Conservation

Many companies are struggling due to the lack of overseas orders. Hyundai Motor and Kia Motors performed better than other automakers, but sales are expected to reach 6 million units in 2020, compared to 7.2 million units in 2019. Major parts makers are suffering from a double whammy due to a significant drop in overseas orders in the first half of the year, so support measures for parts makers that have to worry about survival seem urgent.

It is also necessary to strengthen digital production for non-face-to-face, support pre-investment in autonomous driving and electric vehicles, and investment for the growth of user movement services and delivery services. The development and support of robots and automation technologies for digital production is expected to help prevent situations such as factory closures caused by COVID-19. It is also worth noting that the center of gravity of the automobile industry is rapidly shifting to autonomous driving and electric vehicles, and it is urgent to support pre-investment in autonomous driving and electric vehicles. In addition, investment and support for the growth of user transport services and delivery services are also important for future food.

Long-term policy suggestions: a response strategy that considers future evolution

The movement of the center of gravity to mobility services, autonomous driving, and

[23] Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

electric vehicles can be a fatal blow to most parts makers in Korea, which have mainly produced internal combustion engine-oriented mechanical parts. Related technologies such as sensors, AI, and software for autonomous driving, and most Korean parts makers are not fully prepared in motors, batteries, decelerators, and control software for the development of electric vehicles. In addition, many of the existing auto parts makers are expected to disappear because it is difficult to use existing parts in electric vehicles, which are becoming more important due to COVID-19, and the number of parts is greatly reduced. Existing parts makers' constituti[24]on improvement policies tailored to autonomous driving and electric vehicles need to be implemented as soon as possible while taking a long-term roadmap.

It is also an important policy direction to establish roads, buildings, and smart city infrastructures for the development of mobility services and autonomous driving. Policies that support autonomous driving technology through communication on roads and infrastructure and policies that support elevator and robot communication for robot movement in buildings will also be important directions in terms of services. It is possible to analyze all data such as parts-production-sales-driving, and based on this, it is possible to conduct management services such as fault diagnosis, used car management, and mobility services. The growth of service startups can also be expected through big data analysis such as user movement data and payment data. Support for startups with creative ideas and s[25]upport for growth into unicorns will also be an important direction. In line with the increasing trend of movement, policy support is expected to enable creative ideas to be well received by consumers and grow into large services.

Korean companies are overcoming the crisis by embracing the pandemic, but Korean companies ahead of the full-fledged advent of the post-corona era faced huge barriers in New Challenge. Survival and sustainable development can only be achieved by surpassing this.

---

[24] Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

[25] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

Companies that cannot contribute to the eco-friendly and social safety net through the non-financial crisis of COVID-19 have entered an era of decline. In addition, companies in the export-oriented Korean economy can continue to grow only when they overcome global environmental changes that are deepening their own-centered and protectionism due to weakening international cooperation and reigniting the U.S.-China trade conflict. Changes in consumption trends and the rise of new consumers, such as demographic changes and the rise of the MZ generation, are also challenges for companies. Although all-round digitalization is being promoted in the non-face-to-face era, there are many concerns about how to digitize in corporate sites where the inefficiency of digital investment and strategies is still detected.

In order to overcome the crisis and implement the challenge in this new reality, a different strategy is needed. It is necessary to take the lead in presenting the standards of the new era and establish a management strategy that leads the new paradigm. First, ESG management strategies that strengthen ESG non-financial value and measures for information disclosure should be imported. Second, overcoming globalization is necessary to overcome the global environment where self-centeredness is prevalent. Third, it is necessary to secure customer-centered thinking and consumer response agility (Agility) amid changes in the era when customer experience (CX) [26]has become significant. Fourth, digital transformation (DT) strategies should be recapitulated and responded to the accelerating digital changes.

[26] Viva Republica, Comprehensive Press Releases

CHAPTER 2. INVESTIGATION OF DIGITALIZATION OVERCOMING THE CRISIS OF KOREAN COMPANIES

2.1. Analysis of Factors of Digitalization to Overcome the Crisis of Korean Companies

As discussed earlier, during the COVID-19 Pandemic, the Korean economy showed relatively high economic growth rate compared to advanced countries and regained the 10th place in the global economic scale. In addition, it recorded the lowest export decline among major exporters such as Germany, Japan, the United States, and France, showing a stable overcoming beyond responding appropriately to the crisis of COVID-19.

The background of the remarkable performance of the Korean economy amid the COVID-19 crisis was supported by unexpected propaganda by Korean companies. Representatively, both operating and net profits of KOSPI and KOSDAQ companies showed an increase, and Korean listed companies' performance compared to those of listed companies in major countries recorded a relatively low decline and a high recovery.

Then, what are the key success factors that led to the development of the Korean economy even in difficult situations? There are a total of four key success factors: change acceptability, entrepreneurship, fast execution, and new business creation.

The first key success factor is that Korean companies have led the domestic shock that occurred in Korea in a stable manner compared to other countries based on their acceptability of change. The second showed the entrepreneurial spirit of challenge and innovation that sublimates crises in uncertainty into opportunities. Third, it showed rapid execution in entering new businesses through preemptive business reorganization and M&A (acquisition and merger), and fourth, it created new businesses that meet changing customer needs. (Samjeong KPMG Economic Research Institute)

Korea's Domestic Shock, Stable Compared to Other Countries

In 2020, when the fear of the COVID-19[27] pandemic hit the world, domestic demand in major countries such as Korea, the United States, the eurozone, and Japan was temporarily paralyzed. Since the COVID-19 pandemic began in earnest, domestic demand has been hit several times by COVID-19, but domestic demand in Korea is showing a relatively stable trend compared to other countries. Major industries and companies in Korea have the capacity to rapidly change the environment, which is considered to have been the driving force for recovering from the economic crisis caused by COVID-19.

Major global countries are showing differences in terms of speed and strength of domestic demand recovery after COVID-19. In particular, the United States, the eurozone, and Japan were found to have been somewhat affected by various changes caused by COVID-19. According to an analysis of the monthly increase and decrease in retail sales in major countries in 2020, retail sales in major regions such as the United States, the eurozone, and Japan are at ±20%, and uncertainties in the consumer market are high. This is due to the exponential increase in the number of COVID-19 confirmed cases in a short period of time, strengthening shutdown measures, soaring unemployment rates and continued to shrink consumer sentiment.

Korea has undergone three spreads since the COVID-19 pandemic began in earnest, and during the first spread in February 2020, retail sales shrank sharply, turning a red light on the Korean consumer market. On the other hand, during the second and third spread periods, the impact on domestic demand from COVID-19 was insignificant. As people's consumer sentiment shrank sharply and business environment restrictions increased, retail sales of fashion and clothing (-18.6%), cosmetics (-17.9%), and vehicle fuel (-9.4%) fell significantly. On the other hand, home appliances (+18.5 percent), cars (+17.8 percent), and food and beverage (+9.0 percent) led the recovery of domestic demand and succeeded in defending domestic growth (+0.4 percent of retail sales in 2020). It is analyzed that Korea's acceptance of change played a role in the background of Korea's rapid stabilization of domestic demand

[27] The Influence of Entrepreneurship and Social Responsibility of Small and Medium Business Managers on Entrepreneurial Performance in Pandemic Situation - Pusan National University Graduate School Technical Business Policy Major - Kang Seok-ong

in a short time compared to major countries even when it is difficult to avoid a contraction in consumption due to the pandemic. In other words, this is the result of active attempts by Korea and major Korean industries to respond to the new environment in a timely manner, including the consumer-centered commerce ecosystem.

2.2. Implementation of Fast Digitalization Execution in Overcoming the Crisis of Korean Companies

Challenges and innovations to sublimate crises into opportunities amid uncertainty

Another reason why Korea's economy and corporate performance were able to do well even in the uncertain situation of the COVID-19 pandemic is that our companies have preemptively seized future opportunities based on entrepreneurship and continued to pioneer the global market by challenging new fields.

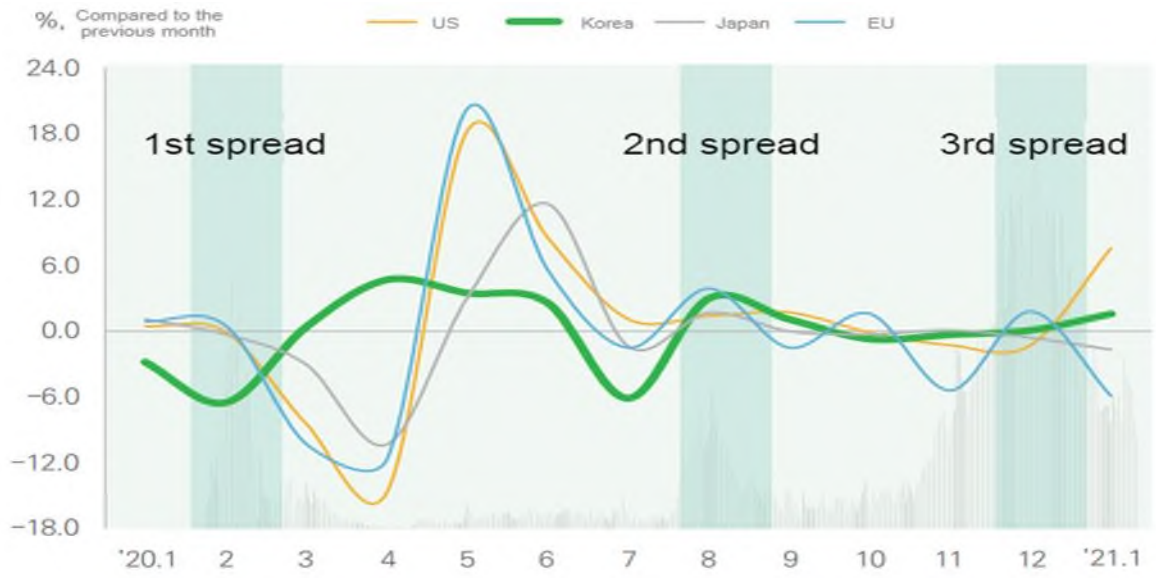


Fig 1.1. Retail sales in major global countries have increased or decreased since COVID-19

Source: Statistics Korea, Bank of Korea, Ministry of Economy, Trade and Industry

Note: The rate of increase or decrease in retail sales of fashion and clothing is

calculated as the sum of retail sales of clothing, shoes, and bags.

Peter Drucker, dubbed the founder of modern business administration, defined entrepreneurship as the "spirit of adventure and challenge to commercialize opportunities captured at risk." Economist Schumpeter also saw that the essence of entrepreneurship lies in 'innovation' to explore new things. In particular, Schumpeter stressed that change through innovation always brings creative destruction that shakes existing markets, which is the driving force behind the development of capitalism and economic growth.

Entrepreneurship was manifested in various industries in Korea despite the difficult situation of COVID-19, especially in the semiconductor, shipbuilding, secondary batteries, and biohealth industries. First of all, domestic semiconductor companies have been strengthening their competitiveness through steady technology and facility investment, and despite COVID-19, semiconductor exports in 2020 grew 5.6% year-on-year, becoming a strong support for the Korean economy. In particular, Korean companies have not been complacent about the success of existin[28]g memory semiconductors, but have been strengthening investment and technology development in system semiconductors, which are considered relatively weak in recent years. As a result, exports of system semiconductors increased significantly to 17.9% year-on-year in 2020, and for the first time in system semiconductors, exports of more than $30 billion were recorded.

1. Semiconductor industry strengthens system semiconductor capabilities beyond memory

Semiconductor exports grew 5.6 percent year-on-year in 2020 (72.5% global market share; NAND 43.9%; Systems 4.1%) System semiconductor exports grew 17.9 percent year-on-year to surpass $30 billion for the first time

2. Investment and development of new technologies from a long-term perspective in the shipbuilding industry

Re-emerged as the world's No. 1 by beating China and Japan in 2020 (43% global

---

[28] Influence of COVID-19 on Korean Labor Market - Graduate School Economics at Chung-Ang University - Applied Economics Major - Lim Eon-yu

market share)

3. The secondary battery industry predicts future demand changes and preemptive investment

2020 Production (20.0% ↑), Domestic demand (11.6% ↑) and export (2.9% ↑) Global market share of electric vehicle batteries more than doubled year-on-year (16.0% → 34.7%)

4. Bio-health industry responds quickly to crisis as an opportunity

Biohealth exports such as medicines, m[29]edical devices, and diagnostic kits exceeded $10 billion for the first time in 2020 (comprehensive media reports, Samjeong KPMG Economic Research Institute)

Fig 1.2 Trends in System Semiconductor Exports in Korea

Source: Ministry of Trade, Industry and Energy

Meanwhile, South Korea's shipbuilding industry, which was at the top of the world, was in trouble in the 2010s, with orders deteriorating after being ranked second for years due to strong challenges from China, which put price competitiveness ahead. However, the Korean shipbuilding industry has continued to make bold investments in eco-friendly technology and smartization, while continuing efforts to preoccupy new markets in the future. As a result, it overtook China in 2018 to regain the No. 1 global market share, and despite the COVID-19

[29] The Impact of COVID-19 on the Labor Market - Hansung University Graduate School - Economics.Real Estate and Economics Major - Lee Bo-hyung

crisis, orders for high-value-added ships such as LNG carriers and mega-sized ships surged. The global market share of the Korean shipbuilding industry in 202[30]0 is 43%, which has been on the rise since 2018.

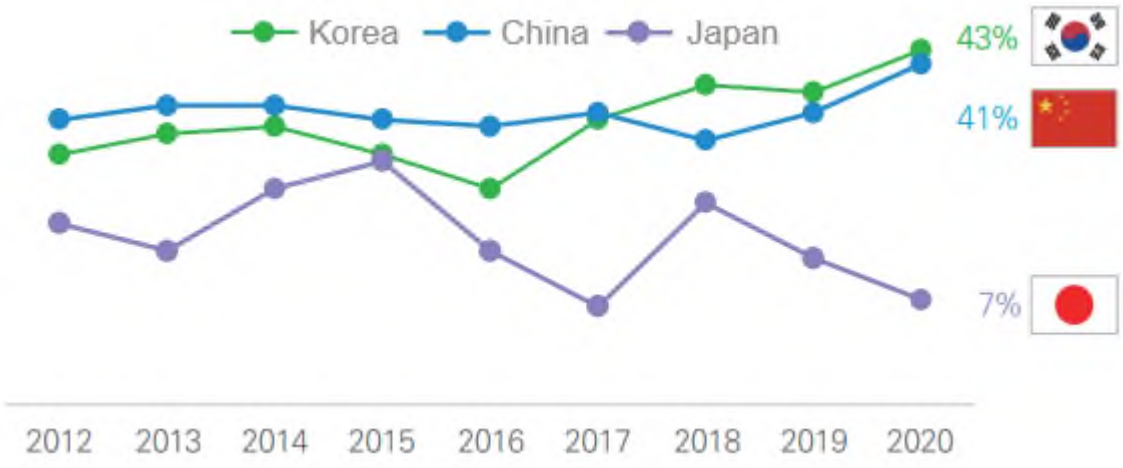


Fig 1.3 Trends in Market Share in Major Countries in the Shipbuilding Industry and Comparison of Order Performance in 2020

Source: Ministry of Trade, Industry and Energy

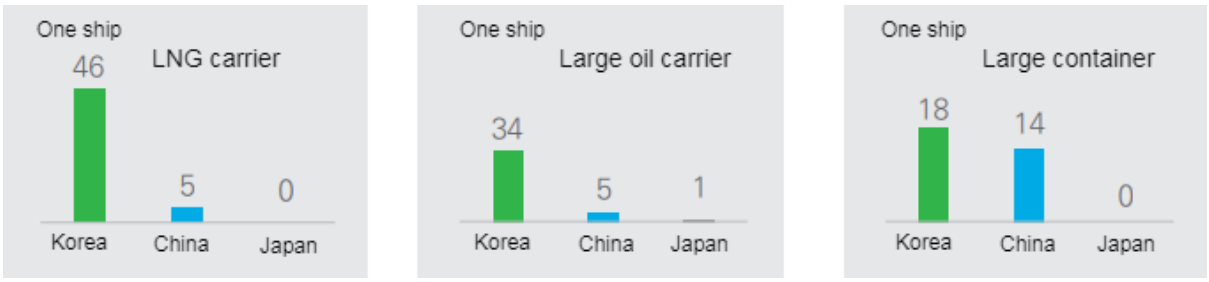


Fig 1.4 Korea's shipbuilding industry, which has given China the No. 1 position over the past decade, succeeded in recapturing No. 1 again in 2018.

Increasing orders for high-value-added ships such as LNG carriers and super-large ships, which require high technology, drives performance gains

Source: Clarksons, Samjung KPMG Economic Research Institute

Note: Large container ships represent 12,000 TEU

---

[30] The Impact of COVID-19 on the Labor Market - Hansung University Graduate School - Economics.Real Estate and Economics Major - Lee Bo-hyung

Another industry that is w[31]riting a success story based on entrepreneurship is the secondary battery sector. Recently, the secondary battery industry has attracted great attention due to the spread of electric vehicles, energy conversion, energy storage system (ESS), and the advent of the digital era, but in the 1990s, when Korean companies started developing technologies, future profits were not guaranteed. However, as a result of steady investment in technological innovation, facility expansion, and overseas market development even during the red period, Korea's secondary battery industry has risen as a new growth engine for the Korean economy, with production, domestic demand, and exports all growing in 2020 despite COVID-19.

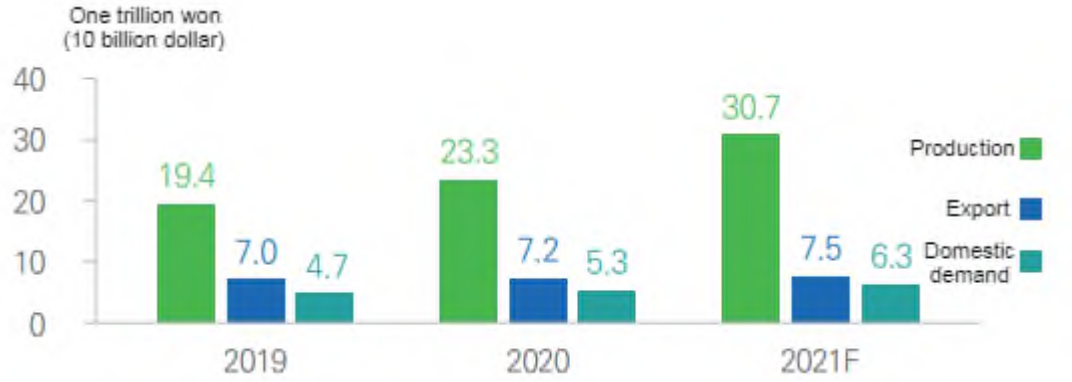


Fig 1.5 Trends in Domestic Sales and Production of Secondary Batteries in Korea

Source: Ministry of Trade, Industry and Energy

Above all, it seems that the growth of Korea's secondary battery industry was driven by lithium-ion batteries for EVs. In[32] 2020, LG Energy Solution, Samsung SDI, and SK Innovation are leading the global electric vehicle battery market as they all grew by more than double digits year-on-year. Combined with the global market share of South Korea's three electric vehicle batteries in 2020, it will more than double from the previous year to 34.7%. LG Energy Solution ranked second, Samsung SDI fifth, and SK Innovation sixth in terms of battery usage and global market share.

---

[31] Samjeong KPMG Economic Research Institute/Statistics Agency, Bank of Korea, Ministry of Economy, Trade and Industry

[32] Samjeong KPMG Economic Research Institute/Statistics Agency, Bank of Korea, Ministry of Economy, Trade and Industry of Japan, Ministry of Trade, Industry and Energy

Table 1.1

Ranking of battery usage with electric vehicles and global market share

Ranking	Manufacturer name	Battery Usage (GWh)		Growth rate (%)	Global Market Share (%)	
		2019	2020		2019	2020
1	CATL	32.5	34.3	5.4	27.6	24
2	**LG Energy Solutions**	**12.4**	**33.5**	**171.5**	**10.5**	**23.5**
3	Panasonic	28.8	26.5	-8.2	24.4	18.5
4	BYD	11.1	9.6	-13.5	9.4	6.7
5	**Samsung SDI**	**4.4**	**8.2**	**85.3**	**3.8**	**5.8**
6	**SK Innovation**	**2.1**	**7.7**	**247.2**	**1.7**	**5.4**
7	AESC	3.9	3.8	-3.1	3.3	2.7
8	CALB	1.5	3.4	127.6	1.3	2.4
9	Guoxuan	3.2	2.5	-22.8	2.7	1.7
10	PEVE	2.2	2	-8.1	1.9	1.4
	etc.	15.8	11.2	-29	13.4	7.9
	Sum	118	142.8	21	100	100

Source: SNE Research

In the bio-health industry, bold challenges and innovations of Korean companies continue. In 2020, Korea's bio-health industry's exports reached $14.1 billion, an increase of 54.4% from the previous year. It is also the first time that biohealth exports exceeded $10 billion, but it is also the first time that it has surpassed existing major export products such as wireless communication devices, textiles, and plastics to enter the top 1[33]0 export items.

[33] Samjung KPMG Economic Research Institute for Media Reporting/SNE Research

This is the result of Korean companies continuously challenging the development of biopharmaceuticals such as biosimilars to enter the global pharmaceutical market, which has been barren, and especially during the COVID-19 period, they preemptively developed diagnostic kits and pioneered the market.

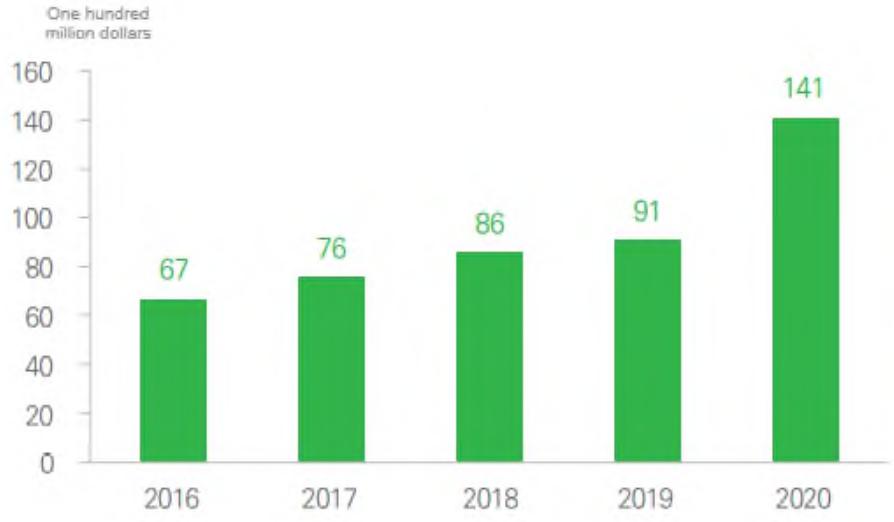


Fig 1.6 Trends in BioHealth Exports in Korea

Source: Ministry of Trade, Industry and Energy

As seen in the cases of semiconductor, shipbuilding, secondary batteries, and biohealth industries so far, Korean companies have been able to turn the crisis into opportunities by pioneering new markets through entrepreneurship despite the uncertain environment of COVID-19. Peter Drucker wrote in his last book, My Personal History in 2006, "Korea is undoubtedly the best practice country for entrepreneurship. Forty years ago, there was no industry in Korea. Today, Korea boasts a world-class level in q[34]uite a few areas," he said, praising Korea's entrepreneurial spirit.

However, the entrepreneurship that led Korea's economic development and industrial growth has been weakening in recent years, and the recovery of this has emerged as a very important task for our society.

In 2020, the Federation of Korean Industries calculated the entrepreneurship index every 10 years by combining cultural factors, institutional factors, economic will, business

[34] Ministry of Trade, Industry and Energy/Clarksons, Samjeong KPMG Economic Research Institute/SNE Research

activities, and the public sector, and as a result, Korea's entrepreneurship index fell by half in the 2010s compared to the 1980s.

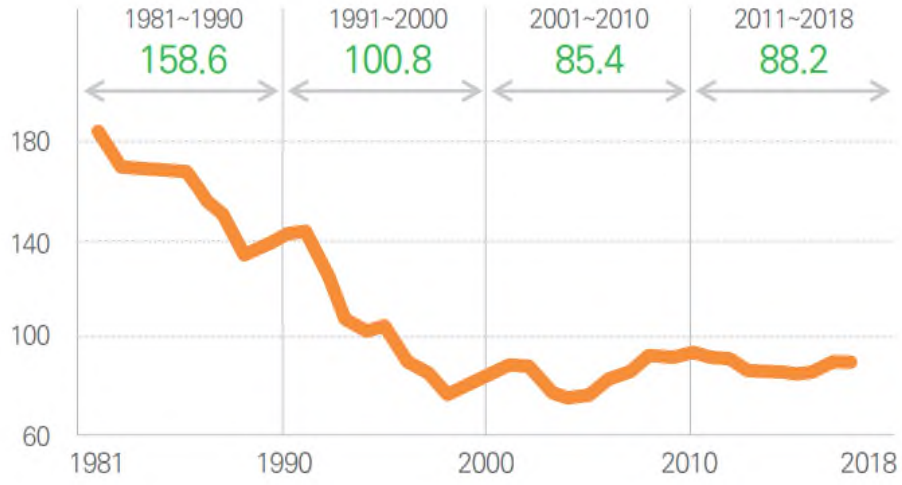


Fig 1.7 Trends in Korea's Entrepreneurship Index

Source: Federation of Korean Industries

Why did the Korean entrepreneurship, which Peter Drucker praised, sink? In this regard, not only companies but also the Korean government and citizens need to think together and seek solutions.

The government should closely examine whether there are excessive regulations on free management activities of companies and continue to push ahead with regulatory reforms. Companies should[35] enhance management transparency and strengthen social responsibility while pursuing non-financial values as well as focusing on financial values.

In addition, it is important to change citizens' perceptions of entrepreneurs and entrepreneurs. The more successful companies there are, the more jobs and tax revenues increase, and the economy develops. In other words, it is necessary to view companies and entrepreneurs as engines to develop our economy rather than from a perspective that exists only for private profit pursuit. Social recognition of businesses and entrepreneurs is the best reward for greater expression of entrepreneurship.

---

[35] Ministry of Trade, Industry and Energy/Clarksons, Samjeong KPMG Economic Research Institute/SNE Research

2.3. Analysis of digitalization system of creating new businesses in Korea

Preemptive business reorganization and M&A to advance into new business. The third reason why Korean companies were able to overcome the COVID-19 crisis is their rapid execution. In the midst of the COVID-19 crisis, Korean companies boldly organized non-core and sluggish projects through rapid decision-making, reorganized their orga[36]nizations through preemptive business reorganization, and quickly jumped into new businesses through M&A.

To gather software capabilities within the group, Hyundai Motor Group is integrating Hyundai Autoever, Hyundai Autron, and Hyundai M&Soft, establishing joint ventures and acquiring stakes to strengthen future mobility sectors such as autonomous driving, robots, and UAM.

SK Group is speeding up its change by quickly selling stakes in non-core businesses such as SKC Kolon PI and TSK Corporation, while selecting high-tech materials, green, bio and digital as the four major growth engines in the future and making massive investments.

LG Group is preemptively preparing for future growth engines through rapid reorganization and establishment of joint ventures. In particular, it is notable that it cleaned up its mobile phone business, which was one of its core businesses in 26 years, and made bold wins in the electric vehicle market. LG Energy Solution, which is in charge of elec[37]tric vehicle battery business, was newly launched by LG Chem, and LG Electronics is rapidly responding to changes in the industry by establishing Magna, the world's third-largest automotive parts company, and LG Magna Powertrain.

Create new demand to meet changing customer needs. Amid the rapid change in consumer lifestyles due to the COVID-19 pandemic, there are next-generation companies that are creating demand with new businesses despite the unprecedented crisis. Despite COVID-19, unicorn companies that continue to grow by creating new needs tailored to changing

---

[36] Ministry of Trade, Industry and Energy/Clarksons, Samjeong KPMG Economic Research Institute/SNE Research

[37] Coupang Reorganizes KPMG Economic Research Institute in Samjeong

customers are being born in Korea. In each industry, such as e-commerce, food delivery, fintech, and mobility, unicorn companies are helping to innovate the industrial ecosystem by expanding their business areas by adding technology capabilities to innovative ideas for business.

The People of Delivery (Delivery Food Service), 'Eating Out' and 'Quick Commerce' Demand Generation

Along with COVID-19, the trend of non-face-to-face consumption continued, and the demand for internal food to enjoy restaurant and restaurant food at home increased significantly. As the food delivery market centered on food delivery applications rapidly expanded, the elegant brothers of the nation's leading player, "Baemin," grew 94.4% year-on-year, surpassing KRW 1 trillion in sales in 2020.

It is also strengthening its competitiveness by upgrading delivery systems through the introduction of delivery technologies such as artificial intelligence (AI) and robots. The Woowa Brothers are looking for business opportunities by expanding their new businesses, includi[38]ng Quick Commerce, which delivers quickly within 30 minutes to an hour using delivery capabilities and networks, and shared kitchen services that collect several kitchens with cooking facilities in one place.

Creating new business value by diversifying logistics, delivery, OTT, etc. from Coupang (online shopping mall) and e-

In the e-commerce sector, Coupang, which is leading various changes in related industries with innovative moves, is considered a representative unicorn. Coupang, established as a social commerce company, accelerated its entry into new business areas for about 10 years and secured customers, allowing it to become an unrivaled e-commerce company.

Coupang has established a logistics infrastructure to enable overnight delivery across the country and is providing delivery services that suit consumer lifestyles such as early morning delivery and same-day delivery. It is expanding its influence in the e-commerce field

[38] Coupang Reorganizes KPMG Economic Research Institute in Samjeong

by expanding its business to overseas direct purchases, food delivery, OTT (online video service), delivery business, and simple payment.

In addition, Coupang showed nearly double its external growth and reduced its deficit during the same period with sales of $19.17 billion in 2020. In March 2021, it was recognized for its corporate value of 100 trillion won and successfully listed on the New York Stock E[39]xchange. It is necessary to watch Coupang, which is changing the domestic e-commerce market by creating aggressive new businesses.

Socar (rental car service), leads car sharing routine and becomes a mobility unicorn company

Although the global sharing economy business model has shrunk significantly due to COVID-19, Socar's 2020 vehicle sharing service increased more than 12% year-on-year, and sales in the car sharing sector increased 11.4% year-on-year to 206.2 billion won.

The main reason for this is that despite the decrease in demand for travel such as business trips and travel due to COVID-19, consumers prefer safe means of transportation to general public transportation, and car sharing has been carried out around Socar. Socar is not only leading the everydayization of car sharing, but also continues to expand new business models by incorporating a subscription economy into vehicle sharing.

For example, the cumulative subscription of Socar Pass, Socar's vehicle subscription product, exceeded 400,000 in 2020, showing a 2.7-fold increase in sales compared to the previous year. Socar, which has continued to grow and create new businesses even during the COVID-19 period, will be recognized for its corporate value of KRW 1.3 trillion in 2020, becoming the 12th unicorn company in Korea and the first in the domestic mobility industry.

Viva Republica (Toss), Fintech Unicorn Becoming a Comprehensive Financial Platform

Viva Republica is an electronic financial company established in 2013, and when it launched the simple remittance app "Toss" in February 2015, it received favorable responses

---

[39] Samjung KPMG Economic Research Institute, Comprehensive Press Releases

from consumers with simple remittance services and free credit rating inquiry[40] services that do not require public certificates. The number of subscribers, which was only 400,000 in 2015, is approaching 18 million (accumulated) in December 2020 thanks to Toss' convenient and diverse service launch. In particular, in 2018, it was recognized for its corporate value of $1.2 billion and was selected as the only fintech unicorn in Korea.

Toss is expanding and developing into a comprehensive financial platform by directly entering the institutional financial industry. Following the establishment of the GA affiliate Toss Insurance in October 2018, Toss Payments (PG) affiliates through M&A (August 2020) and Toss Securities (February 2021), which operates an investment brokerage business, were officially launched. In December 2019, Toss Bank is scheduled to operate in earnest in the second half of 2021 after receiving approval as the third Internet bank in Korea.

Due to expansion and expansion of business size, Toss' sales have grown 167% annually over the past three years, and profitability is also improving. Sales in 2020 rose 230% year-on-year to 389.8 billion won, while operating losses (72.5 billion won) decreased 37% year-on-year as marketing costs decreased through capacity enhancement as its own platform. In June 2021, it was evaluated as an estimated corporate value of $7 billion (estimated) in the process of paid-in capital increase, and its growth continues.

[40] Samjung KPMG Economic Research Institute, Comprehensive Press Releases

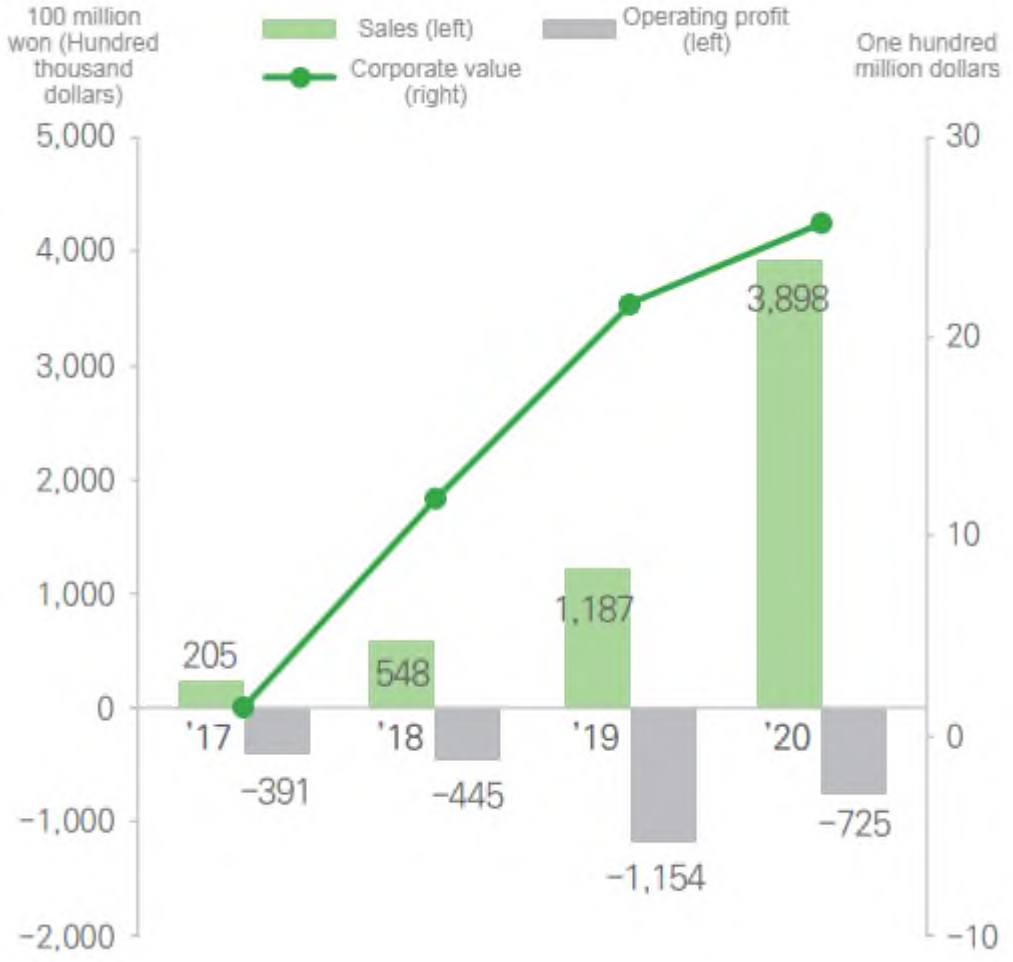


Fig 1.8 Viva Republica Performance and Corporate Value Trends

Source: Viva Republica, Comprehensive Press Releases

Note: 2020 sales and operating profit are consolidated, enterprise value is estimated

Viva Republica Business Structure

Toss Insurance (October 2018): Partnering with insurance companies as a corporate insurance agent to focus on sales of driver insurance, short-term insurance, etc., diagnosis of insur[41]ance status subscribed in Toss app, and providing counseling services through self-insurance counselors

Toss Payments (August 2020): Launched by acquiring the payment business from LG U+, launched free credit inquiry service (card, loan, delinquency status), simple exchange, small fund investment, P2P investment, and launched Toscard in April 2019

[41] Viva Republica, Comprehensive Press Releases

Toss Securities: Obtained preliminary approval for investment brokerage business in March 2020, [42]launched service in February 2021, and can be traded in domestic stocks, bonds, and funds linked to Toss app

Toss Bank (tentative name): Preliminary approval of Third Internet Bank in December 2019 and Toss Bank is scheduled to be launched in the second half of 2021

[42] Viva Republica, Comprehensive Press Releases

CHAPTER 3. OPPORTUNITIES FOR DIGITALIZATION IMPROVEMENT OF HIGH-TECH TECHNOLOGIES MANAGEMENT OF KOREAN COMPANIES

3.1 Prospects for New Reality of Digitalization of Korean Companies

Initially, different responses gradually converged. Although the response by region was different in the early stages of the spread of COVID-19, all countries tried to find a balance between social distancing, protecting individual rights, and preserving economic understanding for quarantine after the blockade was lifted. At a time when the spread of COVID-19 was delayed due to the blockade, individual rights and economic interests could no longer be violated due to quarantine. Most countries chose to control infectious diseases in their daily lives, quarantine measures were taken to mainta[43]in the re-infection rate of COVID-19 near 1.0, and measures were taken to protect the vulnerable. We tried to reduce the conflict between quarantine and individual rights and economic interests.

Despite the tendency of the COVID-19 response to converge, there were still differences between regions. The East Asian region maintained relatively strong control compared to other regions. When the outbreak of COVID-19 was confirmed, there was a tendency to take strong quarantine measures while infringing on citizens' rights and economic interests. After the first blockade, the control for quarantine was lifted in the direction of relatively maintaining individual freedom. On the outside, a policy was taken to slow the spread of infection through voluntary social distancing. In Buk-gu, where social democracy is strongly influenced, voluntary social distancing slowed the spread of infection and tried to harmonize the understanding of individual freedom and public health.

The COVID-19 resp[44]onse has been differentiated in East Asia. China, North Korea,

---

[43] Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

[44] Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

and Vietnam responded with a focus on quarantine. The blockade for quarantine blocked the spread of COVID-19 and took a strong step in quarantine when COVID-19 was found. Singapore and Hong Kong tried to block COVID-19 control based on developed tracking capabilities. Among them, Singapore failed to control the outbreak of COVID-19 in foreign group residential areas. Korea and Taiwan controlled the spread of COVID-19 based on infection prevention using tracking capabilities and voluntary participation of citizens. Japan emphasized the protection of personal privacy and tried to prevent the spread of infection by social distancing of citizens. Among East Asian countries, the most important emphasis was on protecting personal privacy.

The liberal type has effectively returned to moderate collective immunity. Most liberal countries guaranteed individual freedom by allowing the spread of infection to be handled by medical staff after the first round of lockdown. The re-infection rate of COVID-19 remained near 1.0. Due to the development of treatments and the sharing of treatment criteria, the ability to respond has increased compared to the initial spread of COVID-19. Although there have been confirmed cases comparable to the first spread since August 2020, a strong blockade has not been selected.

In the social democratic type, convergence occurred. After the first blockade, the socialist state tried to ensure civil liberties and harmonize quarantine measures. Social distancing and wearing masks were implemented while ensuring the movement of citizens. It tried to control the spread of infection while maintaining the re-infection rate of COVID-19 near 1.0. The spread of COVID-19 was relatively slower than in liberal countries.

Gradual mitigation of containment measures and conflict between public health understanding and citizen understanding

As the spread of COVID-19 decreased due to the blockade, the blockade was eased. As of mid-April 2020, the blockade was gradually eased. It gradually returned to daily life according to the degree of essentiality for social activities. The military, which had been deployed to control movement and maintain order, returned to the barracks and tried to

maintain security and order with police force.

Conflicts between pu[45]blic health interests and civic interests have intensified. There was a conflict between judgment on the degree of necessity in terms of public health and individual freedom/economic understanding. Individuals tried to return to their past routines as much as possible, and the state tried to control them in terms of public health. Conflicts between citizens and countries arose over the speed and extent of the lifting of the blockade. If citizens' resistance leads to public protests and riots, there was a concern that it could lead to the spread of COVID-19.

The expansion of public health work and the increase of administrative personnel

Test, follow-up, and treatment capabilities have been enhanced. After the blockade slowed the spread of COVID-19, the state strengthened its public health capabilities. The distribution of examination equipment, improvement of tracking techniques, and improvement of treatment techniques were carried out in the field. Conditions were provided to slow the control of the spread of COVID-19 through examination, follow-up, and treatment. Groups vulnerable to COVID-19 have been identified and have the capacity to carry out activities to protect them.

In order to take charge of new health tasks with existing administrative personnel, work adjustments have occurred, or new personnel have been increased to take charge of new tasks. In order to solve the overload of public health personnel, the relo[46]cation of existing administrative personnel has been carried out. Administrative personnel were deployed to protect vulnerable social forces in the COVID-19 phase. It tried to solve the work overload by recruiting new public health personnel.

Solutions are in place to satisfy both political activities and the understanding of

---

[45] The Digital Transformation and Implications of the KIET Industrial Economy Analysis for COVID-19 Response

[46] Beyond COVID-19 in the Equinix 2020-21 Global Technology Trends Survey: Digital Transformation Trends After Pandemic

quarantine

Measures have been taken to block infectious diseases and hold elections. After the National Assembly election was held in Korea on April 15, 2020, the election was restored on a limited basis. Elections were held in areas where the spread of COVID-19 was not severe, including three cases in May (national election 2; local election 1), four cases in June (national election 3; local election 1), and six cases in July (national election 6; local election 0). Since September 2020, many elections have been held, and whether quarantine is possible during the voting process has become the key.

Political activity has partially recovered during quarantine. Efforts have been made to find a balance between public health and political activity. The spread of COVID-19 was controlled and limited political activities were allowed in most of the country. Conflicts between the state and civil society were exposed over the balance between quarantine and citizens' politics. In the early days of strong control, the scope of control gradually decreased.

International relations

1) restrictive restoration of trans-border civilian movements

Transbounda[47]ry movement of "essential" personnel required to operate foreign-invested companies was allowed. The movement of manpower, which is essential for the operation of the global value chain, was allowed. As COVID-19 testing became easier and non-confirmed patients were allowed to enter the country, limited restoration of the global value chain was carried out.

Quarantine measures have been added to the demands of citizens who want to move freely. Travel to areas where the spread of COVID-19 was controlled was allowed, and travelers were accommodated from areas where the risk of the spread of COVID-19 was low. The quarantine measures were implemented at the travel destination.

---

[47] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

2) Restricted restoration of diplomacy in a non-face-to-face manner. Diplomacy was conducted through the use of non-face-to-face media to the extent that non-face-to-face multilateral diplomacy would proceed. Non-face-to-face bilateral diplomacy was conducted routinely, and diplomatic activities took place in areas where non-face-to-face diplomacy was possible. Non-face-to-face multilateral diplomacy was partially conducted, and regular or less conflict was conducted through non-face-to-face diplomacy.

Important issues were carried out through direct contact between the two. A plan was prepared to harmonize the movement of essential diplomatic personnel and the need for quarantine. With a doctor's diagnosis attached that he was not infected with COVID-19, some border movements by diplomats began. Important issues began to progress through bilateral diplomacy.

3) Efforts to restore diplomacy in the field of global health governance

Efforts were made to strengthen the role of the WHO. As COVID-19 information was accumulated in the WHO, the WHO presented COVID-19-related information and countermeasures. The WHO's guidelines provided the legitimacy of COVID-19 quarantine in the country. Developed countries began to contribute voluntary contributions to the WHO, promising to contribute at the Global Vaccine Summit [48](June 4, 2020), and the establishment of the WHO Foundation. The provision of physical conditions that can strengthen WHO activities. The U.S. declaration of withdrawal from the WHO served as an opportunity to strengthen the WHO.

Various flows have been carried out for vaccine development. Except for the United States, major countries reaffirmed the WHO as a key topic in the global public health sector through organizations such as the Global Vaccine Summit. The WHO was in charge of the coordination function of COVID-19 research and held several "COVID-19 Research and

[48] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

Innovation Summit."

Coalescence for Epidemic Preparedness and Innovations (CEPI, 2020.8) was formed to raise contributions for joint purchase of vaccines. It led the "COVAX initiative" to ensure balanced access to the "Gavi, the Vaccine Alliance" vaccine, a coalition to expand access to developing countries, and 168 countries participated as of the end of September 2020. Developed countries signed individual contracts with pharmaceutical companies to secure vaccines first.

4) deadlocked U.S.-China relations

The U.S. raised China's responsibility in the middle of the COVID-19 phase. Along with China's responsibility theory, pressure on the public was carried out. The United States has stepped up pressure on China in the high-tech sector beyond the COVID-19 responsibility debate (the case of Huawei's exit movement). Pressure was carried out by mobilizing U.S. allies as well as the U.S., and the U.S. pressed China by conducting naval-air training in Guam (July, September), training with Indian Pacific allies (July), and RIMPAC (September). The U.S. human rights standards were projected on Hong Kong-related issues and arms sales were approved to Taiwan.

5) the resumption of successful quarantine operations

The restoration of military activities, including the Navy and Air Force, was carried out. After the spread of the first COVID-19 infection, quarantine was successful through external blocking and group isolation in the barracks/trap. At the same time, a technique to prevent the spread of COVID-19 was acquired. In order to prevent the spread of COVID-19, the air force and navy training resumed and the combat posture began to be restored. Countries that succeeded in quarantine even conducted ground training, and some countries returned to the pre-COVID-19 era. The unique advantage of the group was that the age of military members was relatively low and the fatality rate after infection was low. In addition, the military is an organization familiar with orders and controls, so an environment has been established to control the spread of infection by reducing dense living in the barracks.

Preparations have been made for future quarantine. After the vaccine was distributed, some countries began preparing to maintain order during the large-scale inoculation period (e.g., Operation Warp in the United States). When vaccines were distributed, the group was more likely to be the first to be vaccinated. In the COVID-19 phase, the procurement of equipment necessary for activities and the conclusion of domestic production contracts were parallel, and preparations were [49]made for re-proliferation control.

6) Emerging security concerns and the rise of development assistance in the health care sector

There has been a slowdown in development assistance for emerging security, centering on the health care sector. Developed countries have not yet escaped the COVID-19 crisis, so they have not been able to afford to expand development aid. Since the end of vaccination in Korea in 2021, it is highly likely that the extra vaccine will be used for development aid in the health sector. In this case, there is a possibility that vaccines will be purchased at the amount allocated for development assistance in the health sector and provided in developing countries. Emerging security agendas are drawing attention, focusing on the health and medical sectors.

The general economy

1) Blocking the Link to the Spread of the Economic Crisis

While the past economic crisis basically began with a financial crisis, the economic shock caused by COVID-19 is discriminatory in that it is a real crisis.

Major advanced countries such as the United States and Europe are relatively effective in responding to the spread of the crisis. Large-scale corporate bankruptcy was very likely to spread to the financial sector, and it is evaluated that major advanced countries effectively prevented corporate bankruptcy, blocking the spread of the shock of COVID-19 to the financial sector.

---

[49] Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

Securing the stability of the economic system

The aspects of crisis response and management in major countries can be divided into (1) minimizing damage, (2) relieving victims, (3) maintaining the economy, (4) securing stability in the economic system, (5) achieving economic recovery early, and (6) seeking new development plans. To date, governments in major countries have succeeded in securing stability in the economic system to some extent, but they are considered to have considerable difficulties in minimizing damage, relieving victims, and securing new development engines.

Industry

1) Seeking to reorganize the industry through digital transformation

Rather than being direct[50]ly affected by COVID-19, digital transformation accelerated the industry reorganization strategy that was being pursued, including China's Manufacturing 2025 and Korea's Digital New Deal. Since details can cause many differences, it is difficult to predict the future success of such a response strategy, but the direction of the strategy is right in that it is established and promoted in terms of digital transformation beyond fragmentary response to COVID-19.

2) Reorganization of the Global Value Chain (GVC) by the Combination of Economic and Geopolitical Factors

Major countries tend to set industrial-level response strategies that focus on resilience at the core. Reshoring can also be understood as being carried out in terms of strengthening resilience, and the problem is that geopolitical factors such as the U.S.-China strategic competition are compounding industrial reorganization strategies. Reshoring is eventually an effort to break away from the China-centered global value chain (GVC), and despite the inefficiency of major countries, including the United States, pushing for such industrial reorganization is a result of a combination of economic and geopolitical factors.

---

[50] Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

In this regard, the central axis of GVC reorganization in the future is changing from the existing 'Just in Time' to 'Just in Case'. In particular, in the United States, there is a g[51]rowing argument that investment incentives should be provided to companies to promote reshoring or near-shoring of supply chains.

3) Promote geopolitical risk management and reshoring

Reshoring would be reasonable to view it as a matter of degree rather than a complete separation of the supply chain. Given the inefficiency caused by decoupling, high levels of decoupling and reshoring will be practically limited, and it can be expected that GVC reorganization will proceed to a certain level in terms of geopolitical risk management. Rather than following past methods such as fostering "national champions" through support for domestic companies, it is an effective response strategy to promote reshoring as a means of diversifying in some major industries.

Trade

1) Promotion of trade policies to promote and induce reshoring of domestic companies

Major countries around the world are actively pursuing trade and industrial policies that promote and induce reshoring of their own companies. European countries are reviewing the reshoring policy of the pharmaceutical industry at the EU level. In addition to the recent rapid increase in the number of reshoring companies in the United States, the United States has also proposed a bill that provides incentives for domestic production of medical equipment and drugs. Japan advocates "supply chain reform" and supports the cost of relocating production bases in the pharmaceutical industry. China has been steadily shifting its growth engines since 2011, advocating a "great domestic cycle." President Xi Jinping's great domestic cycle can be said to have clarified his willingness to achieve technological independence due to the U.S.-China conflict. In addition, China is determined to reduce its dependence on

[51] Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

foreign technology called Liu Bao. [52]

2) International cooperation (limited) restoration of medical and quarantine supplies

Meanwhile, international cooperation on medical supplies and quarantine supplies, which were banned from exporting in the early stages of the spread of COVID-19, is partially being restored. Recently, trade volume of personal protective goods and medical quarantine goods increased in the first half of 2020 due to the need to introduce rapid customs clearance in exporting medical goods or personal protective equipment. While countries around the world continue to pursue protectionism, it can be said that international cooperation has begun to be restored at a limited level for medical supplies. However, it is expected that it will take a considerable amount of time for the restoration of international cooperation to begin in earnest, as strategic considerations are at play as shown in China's "mask diplomacy."

On the other hand, temporary restrictions on access to various data and intellectual property rights accumulated in the process of responding to COVID-19 have been significantly eased, which can be evaluated as an opportunity to activate international cooperation for the production of new treatments or vaccines.

Finance

1) the full mobilization of fiscal, monetary and exchange rate policy instruments

The types of response strategies are largely divided into 1) expansionary fiscal policy, 2) monetary easing policy, and 3) exchange rate policy, but most countries are using all [53]policy measures in a special situation called COVID-19.

Major countries around the world are mobilizing both selective and lump-sum financial

---

[52] Beyond COVID-19 in the Equinix 2020-21 Global Technology Trends Survey: Digital Transformation Trends After Pandemic

[53] Beyond COVID-19 in the Equinix 2020-21 Global Technology Trends Survey: Digital Transformation Trends After Pandemic

support for fiscal policy and investing in measures to expand consumption, such as easing product rights and unemployment benefit standards. The problem is that many countries are expanding their issuance of government bonds and bonds.

As a corporate measure, direct corporate subsidies for survival and employment maintenance are expanded, and credit guarantees for corporate loans are provided unlimitedly.

Monetary policy also uses all available means by governments in major countries, and is actively implementing interest rate cuts and currency expansion.

In response to the exchange rate policy, some developing countries are stabilizing the exchange rate through dollar swaps, devaluation, and control of foreign currency outflows, as exports and foreign tourists decrease at the same time. In order to preemptively prevent the liquidity crisis, the IMF has provided about $878 billion in SDR to 80 countries and is considering expanding SDR support. Meanwhile, countries with high external credit ratings, such as Korea, are also implementing a response strategy to preemptively secure liquidity through the issuance of foreign bonds.

Technology

1) Expansion of Technological Innovation System Based on Public-Private Cooperation: Vaccine Development

Major countries around the world are making efforts to develop vaccines through cooperation with private companies by investing huge budgets, manpower, and experience. In the case of the United States, public-private cooperation is effectively underway, including not only the federal government's fastest budget and resources since the Manhattan Project, but also forming a public-private consortium for vaccine development. In Korea, when developing diagnostic kits, the Korea Centers for Disease Control and Prevention worked closely with private companies, such as reorganizing the emergency use approval system, requesting private companies to develop diagnostic reagents, separating viruses, and selling them separately.

Increasing financial performance and non-financial performance-based corporate value Before and after the COVID-19 pandemic, investors, customers, credit rating agencies, and governments, which are key stakeholders of companies around the world, strongly require companies to have a high level of ESG management system. Global leading investment institutions such as Black Rock have officially declared that they will not invest in companies that lack ESG, while global credit rating agencies such as Moody's have begun to apply their ESG capabilities to credit ratings in earnest. In addition, global companies such as Apple are determined not to do business with suppliers that do not properly manage ESG, and consumers are also increasingly demanding ESG-friendly corporate products. I[54]n addition, governments in each country are also strengthening ESG-related regulations.

What if the ESG demands of various stakeholders surrounding the company are not well received? This will pose a huge risk to the maintenance of corporate value and business continuity. On the contrary, in the case of companies that reflect the needs of stakeholders for ESG, not only will customers' interest in products and services increase, but also investment will expand and capital raising costs will decrease, leading to an increase in corporate value. This is the new management paradigm currently underway. Now, only when a company achieves not only financial performance but also non-financial performance such as ESG together can it move toward maximizing the company's value.

Until now, companies have been engaged in two major management activities from a financial perspective to enhance corporate value. The first management activity is establishing a management strategy. Sales and profits have been maximized through technology innovation, product and service innovation, organizational capacity reinforcement, and investment. The second is to disclose the management performance of these management strategy activities to the capital market through financial statements. ESG management activities can also be divided into two. First, a management strategy is established from an ESG perspective, and second, ESG performance is communicated with market stakeholders through the disclosure

[54] Ministry of Trade, Industry and Energy/Clarksons, Samjeong KPMG Economic Research Institute

of sustainable management reports.

In the end, a company must develop non-financial (ESG) management activities along with existing financial-viewed management activities with a balance, thereby positively affectin[55]g corporate financial statements and increasing corporate value and becoming sustainable.

Global leading companies are already actively engaged in ESG management activities. In the case of Apple, it is innovating its business with the goal of recycling all components from raw materials to hardware components through a robot called Daisy. In addition, Tesla, which has continuously raised the issue of child labor exploitation in the process of producing cobalt, a mineral necessary for electric vehicle batteries, declared "Cobalt Free" that it would not use cobalt in the future and announced plans to develop 100% nickel batteries.

BASF, the world's No. 1 chemical company in sales, offers ESG Code of Conduct in 12 languages to more than 70,000 partners as well as its headquarters. In addition, Basf is conducting "chemcycling" to reuse waste plastics in chemical processes as it has been pointed out that waste plastics are the main culprit of environmental pollution. In Korea, SK Group's ESG management stands out. Eight affiliates of SK Group joined the "RE100" campaign, which is the first Korean company to procure 100% of its electricity used by renewable energy, and SK Hynix declared its "2022 ECO Vision" aimed at producing eco-friendly semiconductors.

As low growth became entrenched after the 2008 financial crisis, the economic conflict between the U.S. and China became visible in the form of a U.S.-China trade war, and COVID-19, [56]which occurred under the strengthening protectionism, created an environment in which government intervention to protect its safety, health, strategic goods industry and jobs. Accordingly, the United States, China, and India are strengthening major import regulations and foreign investment screening to protect their own countries. Furthermore,

---

[55] Ministry of Trade, Industry and Energy/Clarksons, Samjeong KPMG Economic Research Institute

[56] Paik Nam-suk, Senior Manager, Non-face-to-face SW Trends for Digital Transformation in Companies

COVID-19 disrupted global supply chains such as suspension of operations and disruptions in intermediate goods procurement as weak links in GVC (Global Value Chain) erupted, such as excessive dependence on China in the global economy and dilution of comparative advantage in the international division.

Korea's trade dependence (total import and export/GNI) in 2020 after suffering from COVID-19 fell 7.0%p year-on-year to 72.4%, the lowest since 2005 (72.3%). It is analyzed that the main factor is the decrease in both import and export and service industries due to the shutdown of major countries and shrinking tourism demand due to COVID-19 in 2020, and the increase in domestic demand as government spending and investment expanded due to the execution of the supplementary budget. Among them, Korea's exports and imports of intermediate goods to China as of 2019 were 77.4% and 61.6%, respectively, exceeding 2.5 times the share of exports and imports (25.8% of exports and 23.3% of imports). In other words, the dependence on imports and exports of intermediate goods to China is very high.

Korea has been promoting manufacturing-oriented economic growth since the beginning of development due to the lack of domestic demand base such as population size and natural resources. To overcome the recent decline in trade dependence, resulting economic contraction, dependence on intermediate goods for certain countries, and external vulnerability, it is necessary to reorganize GVC, secure export competitiveness, and diversify overseas markets.

In response to protectionism and self-centeredness, domestic and foreign companies have been rapidly reor[57]ganizing their GVCs by diversifying production bases or promoting reshoring, unlike the past when they built the world's most effective value chain based on free trade.

[57] Paik Nam-suk, Senior Manager, Non-face-to-face SW Trends for Digital Transformation in Companies

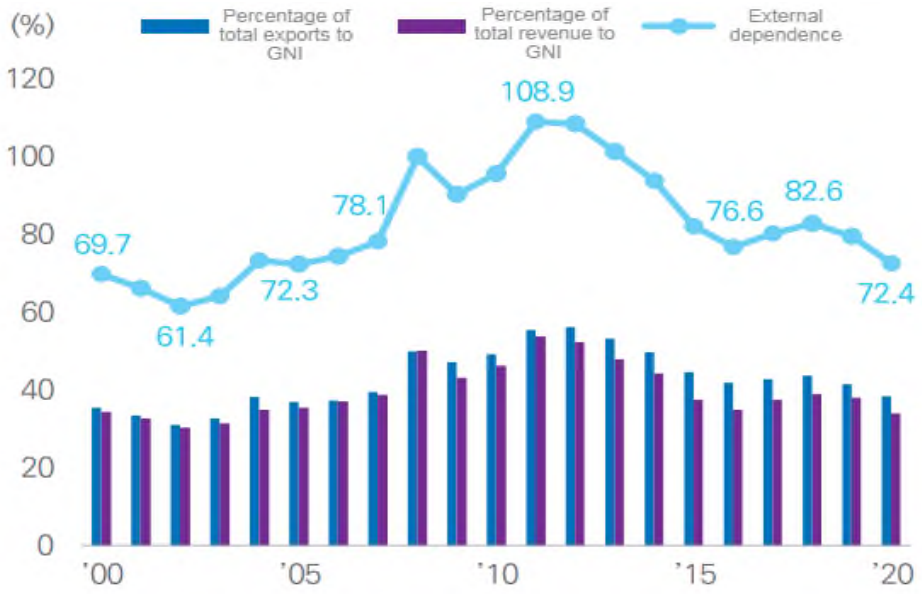


Fig 1.9 Trends in Korea's dependence on foreign countries (weight of import and export to GNI)

Source: Bank of Korea ECOS, Samjeong KPMG Economic Research Institute

Note: External dependence is the sum of total exports and total imports to GNI

First of all, Apple is taking a strategy to escape China in preparation for the possibility of intensifying the U.S.-China trade conflict as well as the burden of rising labor costs in China and supply disruptions caused by COVID-19. Apple announced in January 2021 that it plans to increase its core products such as increasing production of iPhones i[58]n Southeast Asia and expanding production of AI speakers "HomePod Mini" in Vietnam. Pat Gelsinger, CEO of Intel, a U.S. semiconductor company, announced in March 2021 that it would re-enter the foundry (consignment production) business that it had organized in 2018 and launched 'Intel foundry service'. This is due to the growth potential of the foundry market and the oligopoly structure of Asian companies in the foundry market (as of the first quarter of 2021, global foundry market share of TSMC 56%, Samsung Electronics 18%, Taiwan's UMC and U.S. global foundry 7% and China's SMIC 5%).

Meanwhile, Samsung Electronics and LG Chem are among companies that have succeeded in localizing materials and parts and regulating preliminary import response. In

[58] Samjeong KPMG Economic Research Institute

response to Japan's export restrictions on materials, parts, and equipment after the Korean Supreme Court's ruling in 2018, the Korean government has established comprehensive measures for the competitiveness of 100 small, medium, and long-term strategic items, and continued to work together to localize related items early and secure alternative import lines. Since early 2020, Solbrain and RAM Technology, a mid-sized South Korean company, have supplied ultra-high purity liquid hydrogen fluoride products equivalent to Japanese products to Samsung Electronics and SK Hynix and have been used in more than 20 semiconductor manufacturing processes. LG Chem had virtually stopped exporting to Brazil due to antidumping duties imposed since 2008. In the face of judging whether the tariff will continue every five years after the initial anti-dumping tariff, LG Chem presented a systematic and understandable level of techniques for procedural and practical judgment to be carried out by Brazilian anti-dumping investigators based on the advice of KPMG. In August 2020, the [59]final decision of the second sunset retrial ruled that there was no possibility of a recurrence of damage to Brazil's domestic industry, which resulted in the withdrawal of anti-dumping tariffs that had lasted for 11 years since 2008, which is seen as a result of persuading investigative authorities by suggesting creative and preemptive measures.

3.2. Substantiations and Guidelines for Improvement of Customer Experience of Digitalization

An increasing number of companies and consumers are embracing the new reality that "they cannot go back to before COVID-19." One of the different aspects of COVID-19 from the past economic crisis is the fact that the fundamental behavior of consumers has changed.

There are five types of consumption trends that appear when COVID-19 affects consumers' daily lives. Among the COVID-19 consumption trends, untact (non-face-to-face)

[59] Samjeong KPMG Economic Research Institute

and home+econom[60]y is appearing throughout the industry. In addition, the emphasis on essential values (health, safety, life, environment, happiness, family, etc.), anxiety CARE (consumption to reduce anxiety), and egoism (consumption for me) are also observed in the lives of consumers.

In the new reality, it is time for companies to preemptively prepare new standards in the new normal era by analyzing changes in customer consumption and purchase patterns. In order to redesign a business strategy based on changes in consumption trends in a new reality caused by a pandemic, it is necessary to establish a plan to utilize digital technology optimized for business. With the rise of untact, digitalization of companies such as online to offline (O2O) and non-face-to-face purchases should be carried out along with analysis of consumption trends. At the center, data plays a key role. Companies should collect, integrate, and analyze diverse data related to industries and consumers, and use D&A (Data & Analytics) for their businesses. In addition, as the level of customer experience that consumers expect increases, companies must establish strategies based on a detailed analysis of digital customer experience.

With COVID-19, consumers have come to think in depth about what is essentially important to humans. Now, consumers are increasingly interested in the social role of companies. Consumers trust companies that meet their values and show a stronger tendency to consume the products and brands of the companies.

Untact (non-face-to-face)[61]

Fear of face-to-face contact increases with COVID-19. Non-face-to-face consumption of 'untact' consumption without contact with people

Home+Economy

Increased time spent at home with COVID-19. Increase consumption of products and services that support activities that can be done at home

---

[60] SW Industry Strategy Team, SW Industry Headquarters, Lee Soo-jung (leesj@nipa.kr)

[61] SW Industry Strategy Team, SW Industry Headquarters, Lee Soo-jung (leesj@nipa.kr)

Essential Value

As the virus spreads, it places more emphasis on essential values such as 'health, safety, life, environment, happiness, and family', which are essential to humans

Anxiety Care

Consumption pattern that relieves infection anxiety and fear of economic recession and comforts the mind. Purchase products that relieve anxiety and depression by purchasing sanitary products

Egoism

Self-centered consumption 'for me' while avoiding being in one space with an unspecified number of people. a pattern of opening a wallet to a product even if it is a high degree of personal involve

Samsung Electronics' customized home appliance BESPOKE is an example of implementing its customer experience strategy. Samsung Electronics, which launched the Bisfork brand with the Bisfork refrigerator in June 2019, has allowed consumers to choose product types, materials, and colors like Bisfork, which means "As You Say It." Technically, the Bisfork method was possible from the beginning of 2010, but based on understanding of consumers, it chose a strategy not to get ahead. Monitoring the timing of the brand's launch and waiting for consumers to be ready for customized home appliances. As a result, it is expanding its Bispork home appliance lineup by surpassing 1 million domestic cumulative shipments from the time of release of Bispork to December 2020.

In the case of Shinsegae SSG Dotcom, it was launched as a new online integration corporation of Shinsegae Group in March 2019. At the same time as its launch, it focused its investment on delivery services, which are the core competitiveness of its online business. By closely observing and designing the customer journey of online purchase, sales increased 53.3% year-on-year in 2020 to KRW 1.2941 trillion.

Amazon has operated more than 20 Amazon Go stores in four U.S. cities (Seattle, San Francisco, Chicago, and New York) in 2021 after introducing its first unmanned store "Amazon Go" in 2016. It has established unmanned stores with IoT and artificial intelligence

(AI) technologies, and is strengthening its 'Physical = Physical + Digital' customer experience by adding online convenience to its offline strengths.

Founded in 1943 in Sweden and leapfrogged as a global furniture company, IKEA focuses on data-based customer behavior an[62]alysis and e-commerce transformation. IKEA made a decision to boldly abolish the paper catalog, which was considered its icon. The paper catalog, which has been distributed for 70 years, was closed in 2021, and the e-commerce platform is being strengthened to enhance consumers' online purchase experience.

3.3. Suggestions on Measures of Digital Transformation of Korean Companies

COVID-19 Pandemic has rapidly commercialized digital technologies that have remained at the level of test beds, while accelerating digital transformation of many companies. Furthermore, as the digital transformation ecosystem grows larger and larger, it is expanding beyond corporate digitization to an industrial ecosystem. Recently, a new digital tech-based market, which has not been seen before the pandemic, is being created, and technology is being advanced in various fields.

What is noteworthy here is that many companies already sympathized with the need for digital transformation even before the COVID-19 pandemic. However, now, in order to survive in an industrial ecosystem that is changing day by day beyond empathy, it is necessary to come up with countermeasures through digital transformation. In addition, as parts that were technically impossible in the past became viable, it became important to establish a specific strategy for establishing a new market based on digital technology. It is time for companies to review their digital transformation strategies and respond quickly to accelerating changes.

Even before COVID-19, there were companies that preemptively promoted digital transformation in line with changing trends. A representative example is Domino Pizza, which

---

[62] Online shopping platform Timon's quarterly sales growth Yonhap News (20.150 123% (, 2020)

has digitally transformed the organization by declaring it as an "IT company that sells pizza, not a pizza company." Domino's Pizza in the U.S. jumped to second place in the U.S. pizza franchise with the concept of "delivery within 30 minutes" in the early days of its establishment.

However, the burden of excessive fast delivery frequently caused traffic accidents of deliverymen, and a management crisis occurred along with social criticism. Rather than avoidi[63]ng this crisis, Domino's Pizza has broken through with its digital transformation strategy. Domino Pizza launched online and mobile orders in 2007, and has completely revised its existing delivery practices by using delivery data to strengthen marketing.

In 2016, it expanded its delivery platform to smartwatches and AI speakers and used a deep contact strategy that combines analog contact (contact) and digital untact (non-face-to-face). In addition, the number of platforms that can order Domino's Pizza has increased to a total of 36 and delivery methods are diversified to drones and autonomous robots. This strategy hit the mark on the market. The number of stores in the United States increased from 4,929 in 2010 to 6,156 in the first half of 2020, and the proportion of online orders in total sales accounted for 67%.

Airbus in Europe has been engaged in a fierce battle with Boeing in the U.S. within the limited aircraft manufacturing market. In 2017, Airbus decided to introduce Skywise, an open data platform, to gain a competitive advantage. Skywise is an industrial data platform that enables predictive maintenance services based on all data generated in the process of manufacturing and operating Airbus planes. This resulted in increased productivity and reduced cost and development time by integrating aircraft manufacturing-related data into the cloud system. In addition, by providing a platform to compare and analyze its data with [64]global benchmark data to its customers airlines, it has the effect of increasing revenue and

---

[63] Online shopping platform Timon's quarterly sales growth Yonhap News (20.150 123% (, 2020)

[64] Kim Han-hui, Office of Innovation and Growth Policy and Research Institute, hh.kim@kiet.re.kr / 044-287-3212/ Economic Impact and Industrial Policy Implications of Regulation Introduction (2020, co-author)/Analyze changes in industrial structure and labor market according to demographic changes and policy tasks (2019, co-author)

operational reliability across the supply chain.

The best example of digital transformation can also be found in domestic companies. In 2018, SK Hynix applied artificial intelligence technology to the production process to achieve 'zero defect rate'. The strategy was to increase production efficiency by minimizing defect rates through digital transformation at a time when supply cannot keep up with growing demand for semiconductors around the world. Even now, SK Hynix is using artificial intelligence deep learning technology to minimize wafer defect rate. Through this, the non-examination rate, which has defects but cannot be detected, was reduced to 0%, and the over-examination rate, which is judged to be in the absence of defects, was reduced to 3%.

In addition, Kakao Bank, which created new businesses by combining digital and banking services, can be cited. Kakao Bank has established itself as a fast remittance service and zero fee service between customers based on Kakao Talk messenger. Furthermore, it showed rapid growth by creating new businesses such as personalized alarms and card issuance procedures through big data analysis of customers' activity history. In 2020, three years after its launch, Kakao Bank has already succeeded in turning into a surplus, earning 113.6 billion won in net profit. This is more than eight times more than in 2019. In addition, the number of customers, which recorded 13.6 million at the end of 2020, increased to 14.17 million as of the end of March 2021, and the balance received increased from 23.54 trillion won to 25.39 trillion won during the same period. In addition, the monthly net user (MAU) of the app recorded 13.35 million for the month of March 2021, beating existing banks and ranking first.

* Unit: 1 million USD (excluding items per week)	2021	2020	2019	2018
Total current assets	**5636.81**	**2840.71**	**2155.02**	**1234.09**
Cash and short-term investment	3487.71	1251.45	1222.28	611.5
Cash	-	-	-	-
Cash and cash equivalents	3487.71	1251.45	1222.28	611.5
Short-term investment	-	-	-	-
Net receivables	175.35	71.26	63.85	25.92
Net transaction receivables	175.35	71.26	63.85	25.92
Total inventory	1421.5	1161.2	631.74	391.21
Advance payment	-	-	-	-
Total other current assets	552.25	356.8	237.15	205.45
Total assets	**8641.83**	**5067.33**	**3229.85**	**1652.14**
Total Fixed Assets Net	2722.16	2029.2	1003.33	374.04
Total Fixed Assets	3131.15	2364.82	1210.34	522.71
Total accumulated depreciation expenses	-408.99	-335.62	-207.01	-148.67
Goodwill net	9.74	4.25	3.99	4.31
Net intangible assets	-	-	-	-
Long-term investment	-	-	-	-
Long bill	-	-	-	-
Total other long-term assets	273.13	193.17	67.51	39.71
Total other assets	-	-	-	-
Total current liabilities	**4744.29**	**3732.71**	**1881.77**	**1541.48**
Accounts receivable	3442.72	2907.92	1590.51	1184.89
Accounts Payable/Payable Expenses	-	-	-	-
Unpaid expenses	591.36	293.9	132.5	47.05
Promissory notes/short-term liabilities	7.81	156.68	0.32	243.88
Current long-term liabilities/capital leases	341.72	69.93	16.51	-
Total other current liabilities	360.68	304.28	141.93	65.67
Total debt	**6465.88**	**5670.58**	**3294.21**	**2404.75**
Long-term debt	283.19	948.39	773.72	688.45
Long-term debt	283.19	943.19	768.77	688.45
Capital Lease Liabilities	-	5.2	4.96	-
Deferred income tax	-	-	-	-

Minority Shares	-	-	-	-
Other debts, total	1438.4	989.48	638.72	174.83
Total capital	**2175.96**	**-603.25**	**-64.36**	**-752.61**
Total redeemable preferred stock	-	3465.61	3468.55	2019.72
Non-renewable preferred stock	-	-	-	-
Total common stock	0.17	54.95	-	54.38
Capital surplus	7874.04	25.04	25.04	25.04
Retained earnings (accumulated deficit)	-5650.52	-4117.76	-3565.59	-2865.09
Treasury stock - common stock	-	-	-	-
Employee share debt guarantee	-	-	-	-
Unrealized profit (loss)	-	-	-	-
Other Total Equity	-47.74	-31.09	7.64	13.35

Fig 2.0 Coupang's annual balance sheet

(Source: investing.com)

According to Coupang's balance sheet, it has been on a steady rise since 2018 before Corona and 2019 when Corona began. This is because Coupang has been steadily entering the online market and has been preparing for digitalization in earnest since 2021.

Coupang will sign a "digital distribution win-win agreement" under the supervision of the Ministry of Trade, Industry and Energy and participate in a pilot project to build a product standard database for digitizing the distribution process.

Coupang promised to participate in establishing a foundation for co-prosperity and collaboration in the distribution industry to respond to industrial changes caused by digital transformation.

The purpose is to establish a foundation for the application of new technologies in the future distribution process by preparing a standardized product information database of products distributed online.

If a standardized product database is established, an innovative distribution supply chain system that optimizes the entire process of manufacturing, distribution logistics, and customer delivery will be completed through data-based demand prediction. By digitizing all stages of the distribution process, national distribution competitiveness can be strengthened and more distribution innovation companies can be fostered. In particular, the expansion of digital

distribution infrastructure is expected to greatly enhance the shopping convenience felt by ordinary consumers.

As a leading company in online distribution, Coupang plans to carry out a pilot project with the support of the Ministry of Trade, Industry and Energy, and plans to actively participate in the project by developing cases using product standard databases.

CONCLUSTIONS AND SUGGESTIONS

The main results and implications of the survey on the impact and response of COVID-19 in the Korean manufacturing industry are as follows.

As a result of the survey, it was found that many companies are suffering from economic difficulties caused by the COVID-19 shock and are expecting the need to change their corporate management methods from a long-term perspective. In other words, while experiencing negative economic effects such as sales decline and cost increase due to disruption in production and sales activities due to limitations in face-to-face economic activities, many companies are aware of the possibility of a prolon[65]ged COVID-19 crisis and changes in the corporate environment after the crisis. This suggests that active strategies through digital transformation, such as the introduction of non-face-to-face operation methods, are needed to overcome the COVID-19 crisis and secure corporate competitiveness after the crisis.

However, actual digital transformation is mainly made by a small number of companies, and in most cases, even basic responses such as telecommuting and the introduction of video conferencing are insufficient. This is due to the overall lack of resources such as funds, manpower, technology, and information and the resource gap between companies. A small number of companies can invest to lead promising businesses and management efficiency after the COVID-19 crisis through active digital transformation based on available resources, while many companies suffering from resource shortages has low investment capacity or

[65] Song Dan-bi, Deputy Director of Innovative Growth Policy, dsong@kiet.re.kr / 044-287-3188 / Analysis and Implications of Determinants of Domestic Marginal Companies (2021, co-author) / Economic Impact and Industrial Policy Implications of Regulation Introduction (2020, co-author)

interest in future responses.

Digital technology is evaluated as a key factor in overcoming the crisis that allows companies to cope with the new industrial environment through a change in management methods. In addition, it is important to strengthen the industry's capacity to utilize digital technology because it is expected to continue and expand corporate activities to respond to digital-based consumption patterns after COVID-19. On the other hand, depending on the level of corporate response to digital transformation, there may be differences in overcoming the crisis and securing opportunities and competitiveness after the crisis, which may lead to widening gaps between companies. For example, most small companies do not have basic digital infrastructure, which is likely to be difficult to respond properly to digital transformation, which could lead to changes in the industrial environment and threaten future survival. Since the survival risk of individual companies is an important issue that can negatively affect the competitiveness of not only the industry but also the national economy, policy support such as funding, technology, and manpower support for companies alienated from digital transformation is required.

In order to speed up the crisis in a situation where the impact of COVID-19 is large, policy support is needed to alleviate the economic impact of the crisis and support long-term investments to secure competitiveness such as entering new businesses and improving management efficiency. In other words, in order to improve investment conditions and difficulties that make it difficult for companies to actively respond to digital transformation, policy support such as fostering digital technology personnel, infrastructure investment tax deductions, and policy funding should be expanded.

REFERENCES

1. The Influence of SME managers' entrepreneurship and social responsibility on entrepreneurial performance in Pandemic situations - Pusan National University Graduate School Technical Business Policy Major - Kang Seok-bong
2. The Impact of COVID-19 on the Korean Labor Market - Chung-Ang University Graduate School of Economics - Applied Economics Major - Lim Eon-yu
3. The impact of COVID-19 on the labor market - Focusing on the employment substitution of young and middle-aged people - Hansung University Graduate School - Economics. Real Estate and Economics Major - Lee Bo-hyung
4. Resumption of activities Economic rebound Increasing infections Reblocking economic rebound International Financial Center (, 20.7.)
5. Increased quarterly sales on online shopping platform Timon, Yonhap News Agency (20.150 123% (, 2020)
6. Non-face-to-face SW Trends for Corporate Digital Transformation Senior Director Nam-seok Paik (nsbaek@nipa.kr) and Senior Director Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team at SW Industry Headquarters
7. Samjeong KPMG Economic Research Institute
8. Statistics Korea, Bank of Korea, Ministry of Economy, Trade and Industry
9. Comprehensive Press Report, Samjeong KPMG Economic Research Institute
10. Ministry of Trade, Industry and Energy
11. Clarksons, Samjung KPMG Economic Research Institute
12. Coupang, comprehensive media coverage, reorganization of Samjeong KPMG Economic Research Institute
13. Comprehensive media coverage, Samjeong KPMG Economic Research Institute

14. Viva Republica, comprehensive media coverage

15. Bank of Korea ECOS, Samjeong KPMG Economic Research Institute

16. Kim Han-hui, Office of Innovation and Growth Policy and Research Institute, hh.kim@kiet.re.kr/044-287-3212/ Economic Impact and Industrial Policy Implications of Regulation Introduction (2020, co-author)/Analyzing changes in industrial structure and labor market according to demographic changes and policy tasks (2019, co-author)

17. Song Dan-bi, Office of Innovative Growth Policy and Associate Researcher, dsong@kiet.re.kr/044-287-3188/Deterministic Analysis and Implications of Domestic Marginal Companies (2021, co-authored)/Economic Impact of Regulation and Industrial Policy Implications (2020, co-authored)\Cho Sung-eun, Research Institute for Information and Communication Policy of the Economic and Humanities Society, Digital Transformation and Economic and Social Future Prospects after COVID-19

18. Samjeong KPMG Economic Research Institute's Corporate Challenge and Post-COVID-19 Strategy

19. Non-face-to-face SW Trends for Enterprise Digital Transformation (nsbaek@nipa.kr) Senior Manager Baek Nam-seok (nsbaek@nipa.kr) and Lee Soo-jung (leesj@nipa.kr) SW Industry Strategy Team of SW Industry Headquarters

20. The Digital Transformation and Implications of the KIET Industrial Economy Analysis for COVID-19 Response

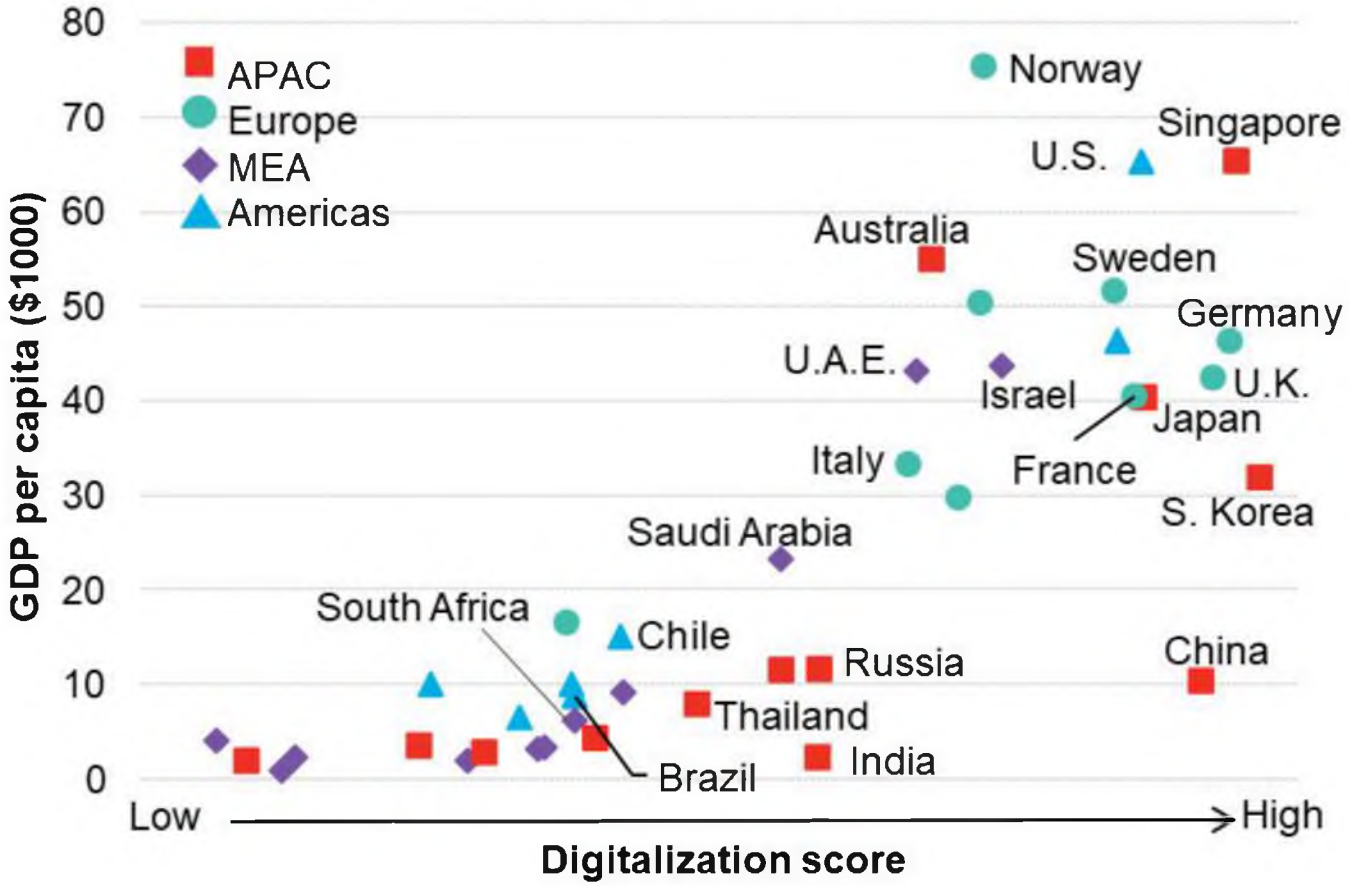
21. Beyond COVID-19 in the Equinix 2020-21 Global Technology Trends Survey: Digital Transformation Trends After Pandemic

22. investing.com

APPENDICES

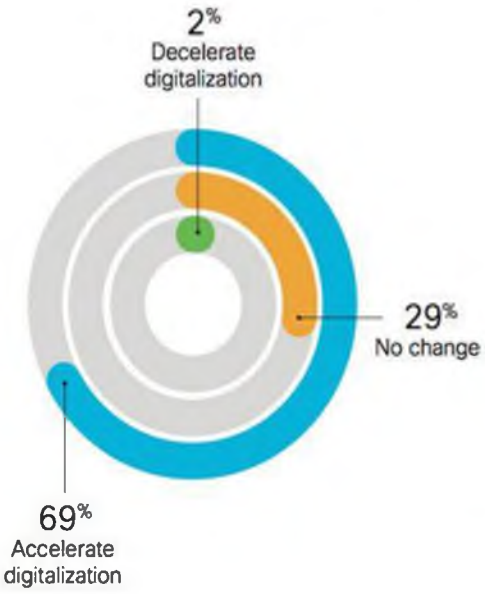
Appendices A

Figure 1: BNEF digitalization score vs GDP per capita

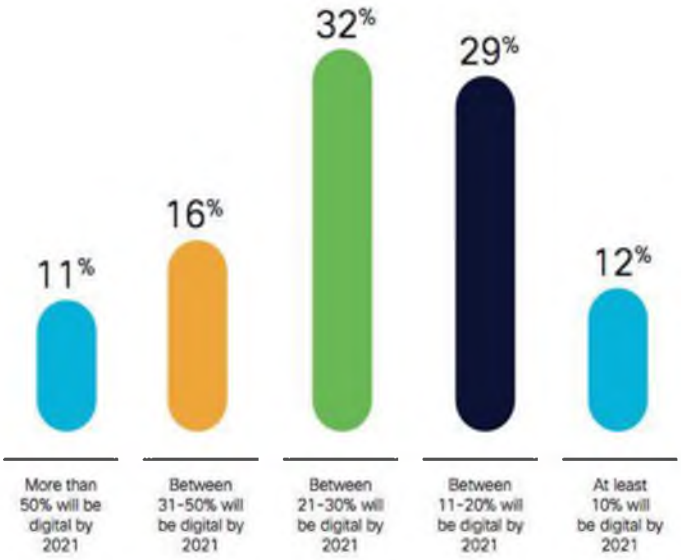


Source: BloombergNEF. GDP data for 2019 from World Bank.

Is COVID-19 going to accelerate the digitalization of your business?



How much is COVID-19 going to accelerate the digitalization of your business?



Source: Cisco

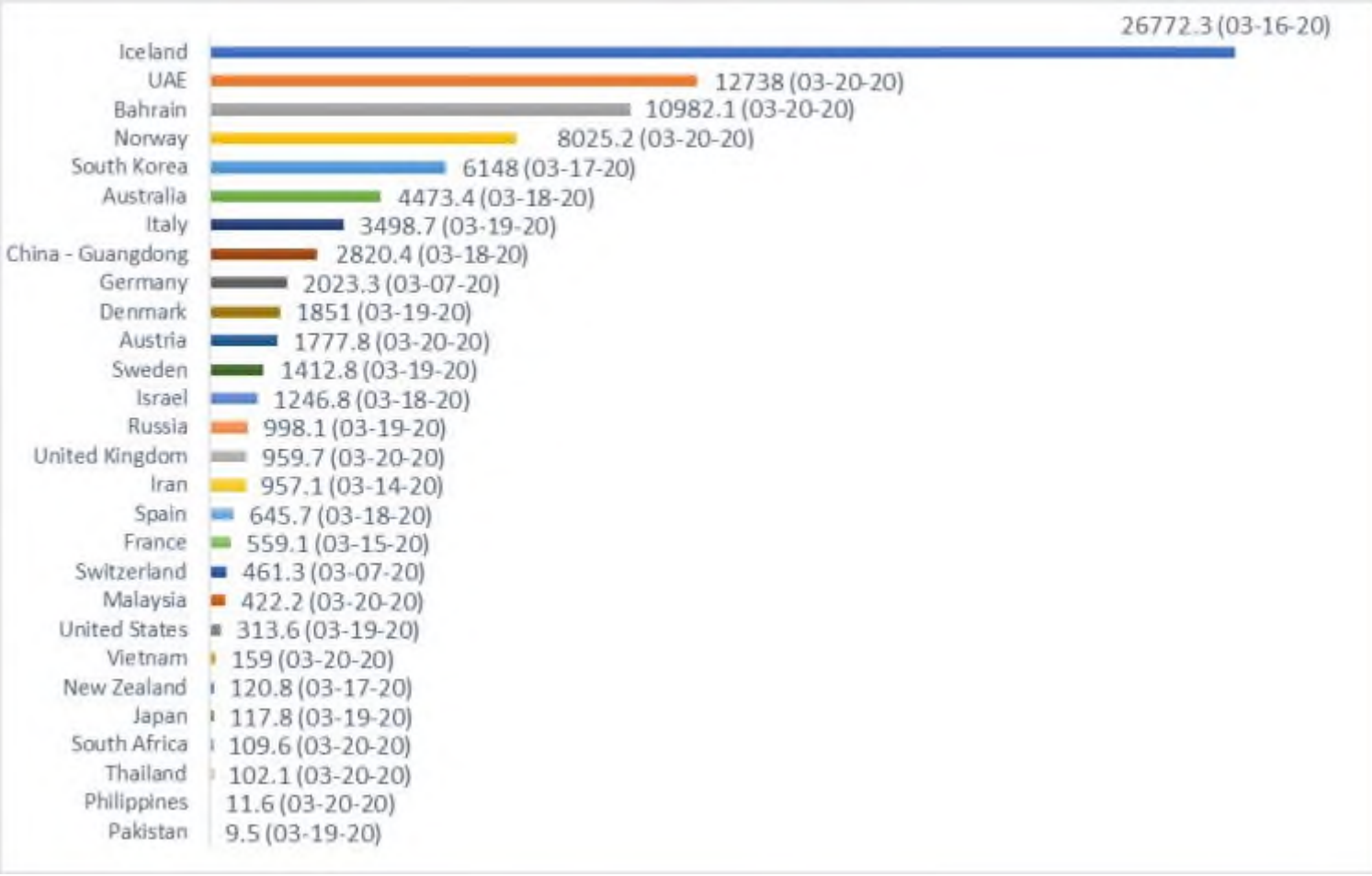


Fig 2. Total COVID-19 testing per million people

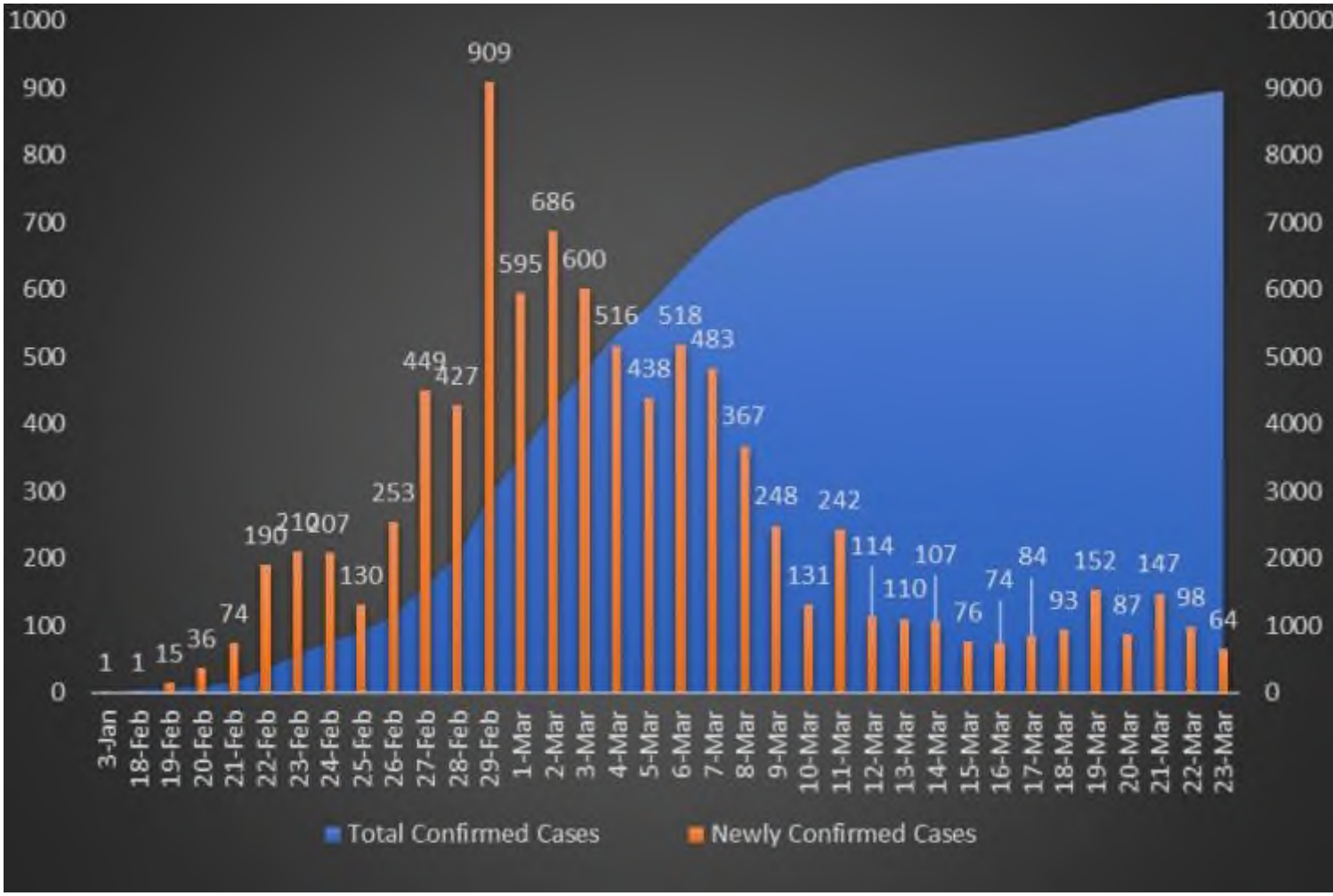


Fig3. Coronavirus cases in Korea