[Working Paper Series: Pandemic Crisis and Democratic Governance in Asia – Part 2]

South Korea's COVID-19 Pandemic Policy Optimization between Health and Economy

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Introduction

How have policymakers and citizens responded to the COVID-19 pandemic policy trade-off between health and the economy? Why have some nations succeeded in minimizing the trade-off between protecting lives and protecting livelihoods, but not others? Why and how has South Korea outperformed most other advanced democracies in dealing with the trade-off?[1]

Building on a growing literature that analyzes the trade-off between health and the economy in designing and implementing national COVID-19 policy responses (Desierto and Koyama 2020; Cheibub, Hong, and Przeworski 2020; Ginsburg and Versteeg 2020), this study attempts to answer the above questions examining the case of South Korea in a comparative perspective. This research argues that contra conventional wisdom that social capital is the explanans of variation of national pandemic policy performances, social risk is much more important to facilitate large-scale collective action, which is the political foundation of voluntary civic compliance with government non-pharmaceutical interventions (NPIs) policy recommendation and ultimately successful pandemic policy optimization between health and the economy.

A simple theoretical framework of pandemic policy optimization will be introduced in the next section. The third describes a quarterly comparison of national policy responses across OECD countries in 2020. The following section provides a case study analysis on the determinants of pandemic policy optimization in South Korea.

[1] Why some nations have outperformed others in vaccinating against COVID-19 is the question that this study will explore in the next round of research project. For now, I suggest that the better the health performance of a nation is, the poorer the vaccination performance of it has. See the appendix for a preliminary association between the total COVID-19 cases per million and the people vaccinated per hundred in OECD countries as of May 14, 2021.

Pandemic Policy Optimization as Large-Scale Collective Action Problem

This section assumes that a simple theoretical framework of pandemic policy optimization is a large-scale collective action problem. How to suppress the spread of the coronavirus is a vital question for pandemic-inflicted countries. A good starting point to answer this question is to analyze the effective reproduction rate (ERR), which is defined as the average number of infections that an infectious individual transmits to susceptible individuals. In the most basic standard model of an epidemic, the ERR(t) as of day t is given as follows:

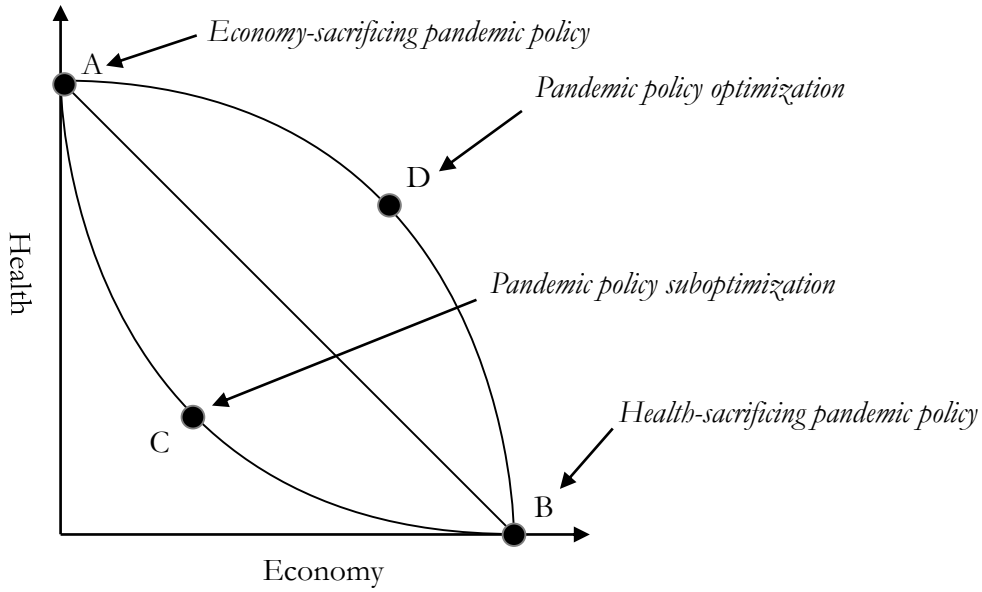
$$ERR(t) = N(t) \times D(t) \times P(t) \times S(t)$$

In this equation, N(t) is the average number of contacts per day for an individual in the community; D(t) is the average number of days that an infectious individual circulates in an infectious community; P(t) is the probability that contact between an infectious individual and a susceptible individual actually transmits the virus; and S(t) is the share of the population susceptible to infections as of day t (Sachs et al. 2020: 15-19).

Each component of the equation corresponds to a specific pandemic policy profile. Figure 1 illustrates the trade-off of each pandemic policy: (1) suppressing N(t) as a pandemic policy is equivalent to a temporary lockdown policy which prioritizes lives at the cost of livelihoods (A in Figure 1), which results in economy-sacrificing pandemic policy; (2) suppressing S(t) as a pandemic policy is equivalent to herd immunity policy which prioritizes livelihoods at the cost of lives (B in Figure 1), which results in health-sacrificing pandemic policy; and (3) suppressing D(t) x P(t) as a pandemic policy is equivalent to NPIs policy which attempts to balance the two.[2] If the NPIs policy fails, the outcome is a negative-sum product of the health and economy (C in Figure 1), which results in pandemic policy suboptimization. If the NPIs policy succeeds, the outcome is a positive-sum product (D in Figure1), which results in pandemic policy optimization.

[2] NPIs include (1) social distancing measures, with the closing of workplaces and non-essential services, closing school, banning mass gatherings, and imposing travel restrictions; (2) personal and environmental hygiene, with the use of personal protective equipment and such as face masks; and (3) testing, tracking, and tracing of infected individuals, with the confinement of affected persons and large-scale testing and quarantine policies (Sustainable Development Solutions Network and Institute for European Environmental Policy 2020: 25).

Figure 1. Trade-off Between Health and the Economy in Pandemic Policy



Neither the temporary lockdown policy nor the herd immunity policy is sustainable as a pandemic policy. The temporary lockdown policy is an inefficient way to suppress the pandemic due to its economic costs. The herd immunity policy is an inefficient way to suppress the pandemic due to its health costs. Since only the NPIs policy is sustainable as a pandemic policy, it is important to understand under what the conditions are for the policy to succeed.

It is crucial to note that non-NPIs policies, such as temporary lockdown or herd immunity, do not entail voluntary civic compliance with government guidelines. The temporary lockdown policy coerces the public to isolate under government enforcement. The herd immunity policy lacks any enforcement and lets the people move around freely. Neither case involves a large-scale collective action for the public to voluntarily comply with government intervention (Harring et al. 2021).

Since the NPIs policy as pandemic policy requires voluntary civic compliance, it is essential to understand under what conditions such large-scale collective action is facilitated. One of the most influential arguments hinges on the logic of social trust that is defined as "values and beliefs that help a group overcome the free-rider problem in the pursuit of socially valuable activities (Barios et al. 2021)." It insists that the higher social trust is in a country, the more likely large-scale collective action is to be facilitated (Durante et al. 2021; Sabat et al. 2020). Another theory relies on the logic of confidence in authority (Fukuyama 2020). It claims that the more trust citizens have in the public authority, the less likely large-scale free-riding problem is to emerge (Elgar et al. 2020; Bargain and Aminjonov 2020).

Against these dominant logics of social capital in this field, this study suggests a contrarian approach to the question. Building on the logic of social risk defined as "the probability for a person to be affected by an unexpected, uncertain situation associated with loss of control over one's personal action (Lupu 2019)," it contends that the worse the social risk is in a country, the more likely large-scale collective action is to be facilitated.

Regarding the issue of large-scale collective action, whereas the logic of social capital may prevail in a time of normal politics, the logic of social risk will triumph in a time of crisis politics, a situation that "threatens significant harm to a country's population or basic values and compels a political response under time pressure and uncertainty (Lipscy 2020)." Even the most qualified policymakers are uncertain about what policies will succeed due to the high level of threat, time constraints, and the uncertainty surrounding the pandemic, a more or less common occurrence across countries (Backus and Little 2020). The preparedness and agility of citizens against the pandemic differ across countries, depending on how long they have been exposed to and accustomed to such threat (Dryhurst et al. 2020).

To sum up, this study argues that the severer the level of social risk is in a country leads to the following: large-scale free-riding problem is less likely to emerge, voluntary civic compliance with the government's NPIs policy becomes more likely, and pandemic policy optimization is more likely to succeed in a time of crisis politics.[3]

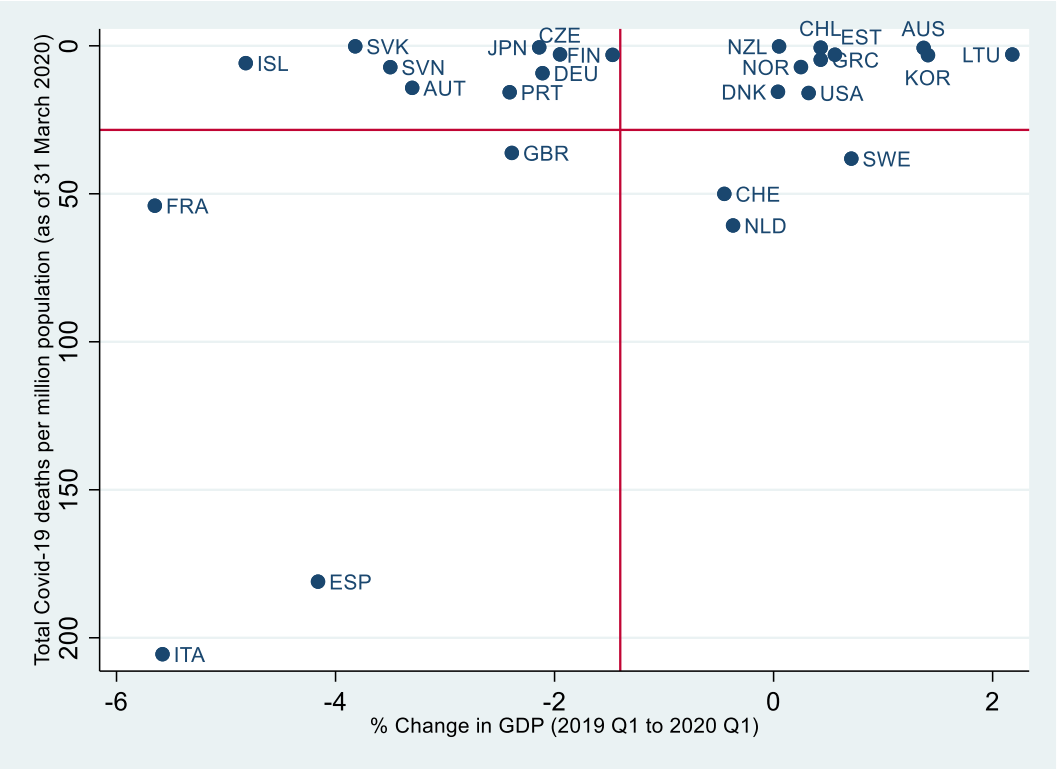
South Korea's Pandemic Policy in Comparative Perspective: A Descriptive Exploration

This section introduces several types of data to analyze the impact of social risk and social capital on pandemic policies of different countries. Considering possible causal heterogeneity between democracies and autocracies in dealing with the pandemic (Stasavage 2020; Greitens 2020), the spatial empirical scope of this study is based on advanced industrial democracies.[4] The temporal empirical scope of this study subdivides 2020 into four quarters to increase the number of observations which raises the bar to test the theoretical hypothesis.

To capture the pandemic policy performance on the health dimension, the total COVID-19 deaths per million in each quarter of 2020 is utilized.[5] To observe the pandemic policy performance on the economic dimension, the percentage change in GDP between each quarter of 2020 to its counterpart in 2019 is employed.[6] Compared to the alternative indicators, the aforementioned types of measuring the health and economic dimensions of the pandemic policy have the merit of being simpler,more intuitive to understand, and easier to replicate.[7]

[3] By implication, once the threat, time pressure, and uncertainty surrounding the pandemic crisis are subdued and normal politics replaces crisis politics, the logic of social capital may restore its facilitator status of large-scale collective action, which is an empirical question that this study plans to tackle in next round of this research project.
[4] Among 37 OECD member countries, Columbia, Hungary, Mexico, Poland, and Turkey are excluded due to their democratic backsliding, which is measured by Varieties of Democracy's liberal democracy index score of seven or under. In addition, Canada, Belgium, Ireland, Israel, Latvia, and Luxemburg are excluded due to the unavailability of data in the seventh wave of World Value Survey, which is the source of social capital measurement. As a result, the dataset of this study includes 26 OECD member countries, which are Australia, Austria, Chile, Czech Republic, Demark, Estonia, Finland, France, Germany, Greece, Iceland, Italy, Japan, Lithuania, Netherlands, New Zealand, Norway, Portugal, Slovak Republic, Slovenia, South Korea, Spain, Sweden, Switzerland, the United Kingdom, and the United States.
[5] The data on the total Covid-19 deaths per million population is derived from Our World in Data https://ourworldindata.org/coronavirus.
[6] The data on percentage change in GDP is derived from OECD Data https://data.oecd.org/gdp/quarterly-gdp.htm#indicator-chart.
[7] The COVID index of Sachs et al. (2020) consists of deaths per million, effective reproduction rate, epidemic control efficiency. The Covid resilience score of Chang et al. (2021) reflects the two dimensions of COVID status, which consists of 1-month cases per 100,000, 1-month case fatality rate, total deaths per 1 million, positive test rate, and access to COVID vaccines, and quality of life, which consists of lockdown severity, community mobility, 2020 GDP growth forecast, universal healthcare coverage, and human development index.

Figure 2. COVID-19 Pandemic Policy Outcomes in OECD Countries, 1st Quarter of 2020



Source: Our World in Data and OECD[8] (accessed on January 22)

Figure 2 illustrates the outcome of COVID-19 pandemic policies in OECD countries during the first quarter of 2020. The vertical axis represents the health dimension of the pandemic policy–the total COVID-19 related deaths per million. As the smaller number in the health dimension implies a better outcome, the scale of the vertical axis is reversed to run from maximum to minimum for the comfort of the reader. The horizontal axis represents the economic dimension of the pandemic policy–the percentage change in GDP compared to the previous period. On each axis, a linear line is superimposed to indicate the average value of each dimension, which enables the classification of OECD countries into four different pandemic policy outcomes along the theoretical predictions elaborated in the previous section: (a) economy-sacrificing pandemic policy; (b) health-sacrificing pandemic policy; (c) pandemic policy suboptimization; and (d) pandemic policy optimization.

In the first quarter of 2020, the countries that implemented an (a) economy-sacrificing pandemic policy are Japan (JPN; the first COVID-19 death on February 13), Germany (DEU; March 9), Austria (AUT; March 12), Slovenia (SVN; March 14), Portugal (PRT; March 17), Finland (FIN; March 21), Iceland (ISL; March 21), the Czech Republic (CZE; March 22), and the Slovak Republic (SVK; April 1),[9]; those who implemented a (b) health-sacrificing policy are Switzerland (CHE; March 5), the Netherlands (NLD; March 6), and Sweden (SWE; March

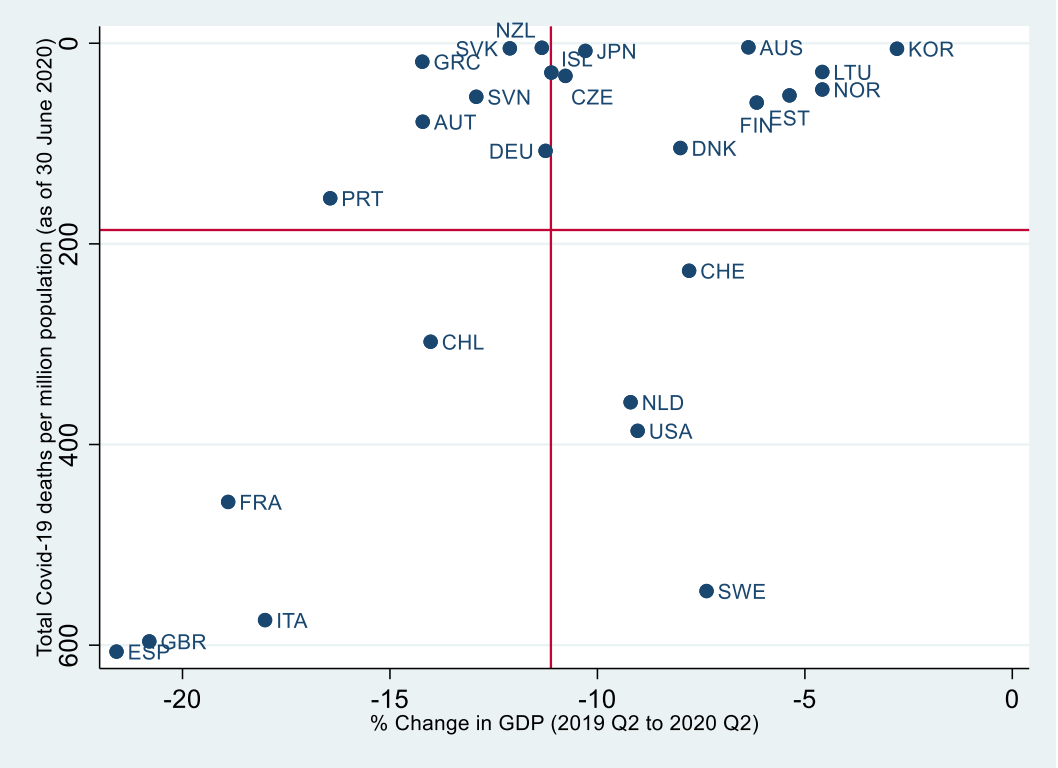
[8] Our World in Data https://ourworldindata.org/coronavirus and OECD Data https://data.oecd.org/gdp/quarterly-gdp.htm#indicator-chart.

[9] For the Slovak Republic, the data on the total Covid-19 deaths per million in the first quarter of 2020 is taken from the record of April 1, 2020.

10); those who opted (c) pandemic policy suboptimization are France (FRA; February 15), Italy (ITA; February 21), Spain (ESP; March 3), and the United Kingdom (GRB; March 6); and those that implemented a (d) pandemic policy optimization include South Korea (KOR; February 20), the United States (USA; February 29), Australia (AUS; March 1), Greece (GRC; March 11), Denmark (DNK; March 14), Norway (NOR; March 14), Lithuania (LTU; March 21), Chile (CHL; March 22), Estonia (EST; March 25), and New Zealand (NZL; March 29).

The distribution of OECD countries along the two dimensions reflects the different timing of the COVID-19 outbreak. The magnitude of the impact was found to be enormously heterogeneous so it may be difficult to judge the performance of each national pandemic policy in the first quarter of 2020. Therefore, if samples are divided into two groups- one made up of "early sufferers" that experienced the first COVID-19 related death before March 10, and another made up of "late-sufferers" that experienced their first COVID-19 related death after March 10- then late sufferers such as New Zealand, Estonia, Chile, Lithuania, Norway, Denmark, and Greece, will have to be excluded. However, even when this exception is considered, it is noteworthy that South Korea strikingly outperformed France or Italy in optimizing pandemic policy profiles despite the fact that these countries are early-sufferers.

Figure 3. COVID-19 Pandemic Policy Outcomes in OECD Countries, 2nd Quarter of 2020



Sources: Our World in Data and OECD

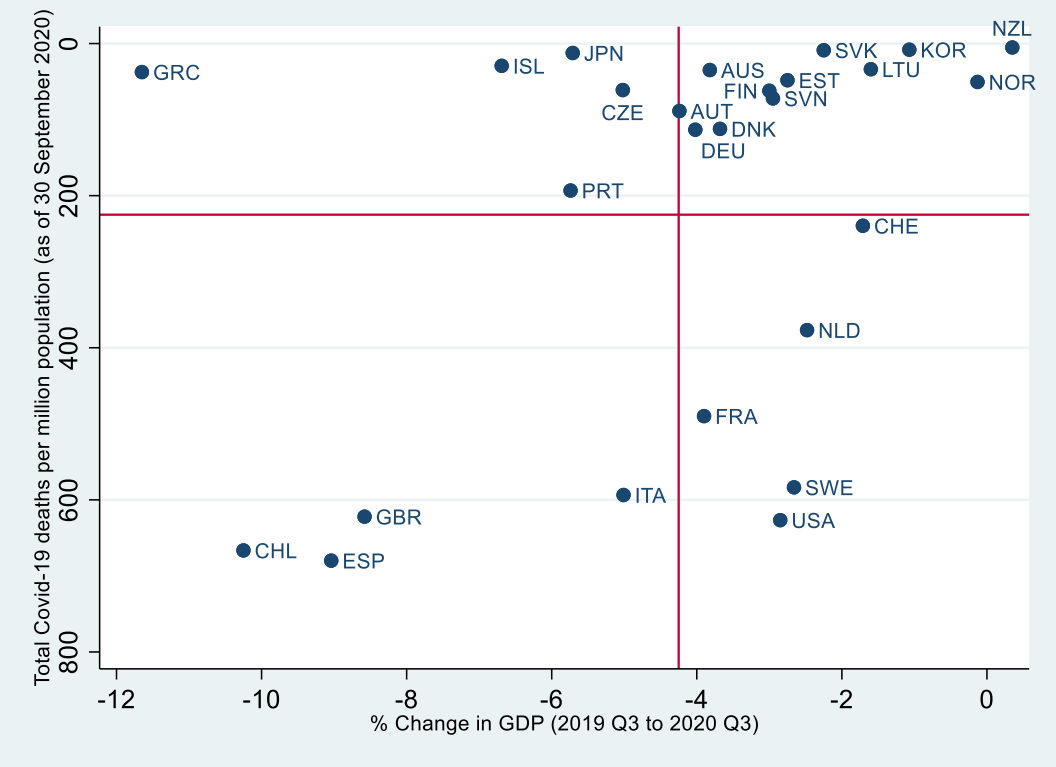
Figure 3 indicates the pandemic policy outcomes in OECD countries during the second quarter of 2020. During this period, the severity of the pandemic on both dimensions was magnified. In the health dimension, the sample average of the total COVID-19 deaths per million increased from 28.4 in the first quarter to 186.1 in the second quarter. In the economic dimension, the sample average of the percentage change in GDP compared to

previous period noticed an increase from -1.4 in the first quarter to -11.1 in the second quarter. The growing severity of the pandemic may help identify pandemic policy over-performers due to temporal good luck and pandemic policy under-performers due to temporal bad luck.

Among those that belong to (d) pandemic policy optimization in the first quarter, Greece and New Zealand shifted to (a) economy-sacrificing policy, the United States shifted to (b) health-sacrificing policy, Chile shifted to (c) pandemic policy suboptimization, and the rest of the cases remained in the same category. Countries that belonged to (c) pandemic policy suboptimization and (b) health-sacrificing policy in the first quarter stayed in the same categories. Among those characterized of having (a) economy-sacrificing policy in the first quarter, only the Czech Republic, Finland, Iceland, and Japan shifted to (d) pandemic policy optimization.

It can be argued that the national performance of the countries that shifted from (d) pandemic policy optimization to other categories might have overestimated and those that shifted from (a) economy-sacrificing policy to (d) pandemic policy optimization might have underestimated the initial phase of the pandemic crisis.

Figure 4. COVID-19 Pandemic Policy Outcomes in OECD Countries, 3rd Quarter of 2020



Sources: Our World in Data and OECD.[10]

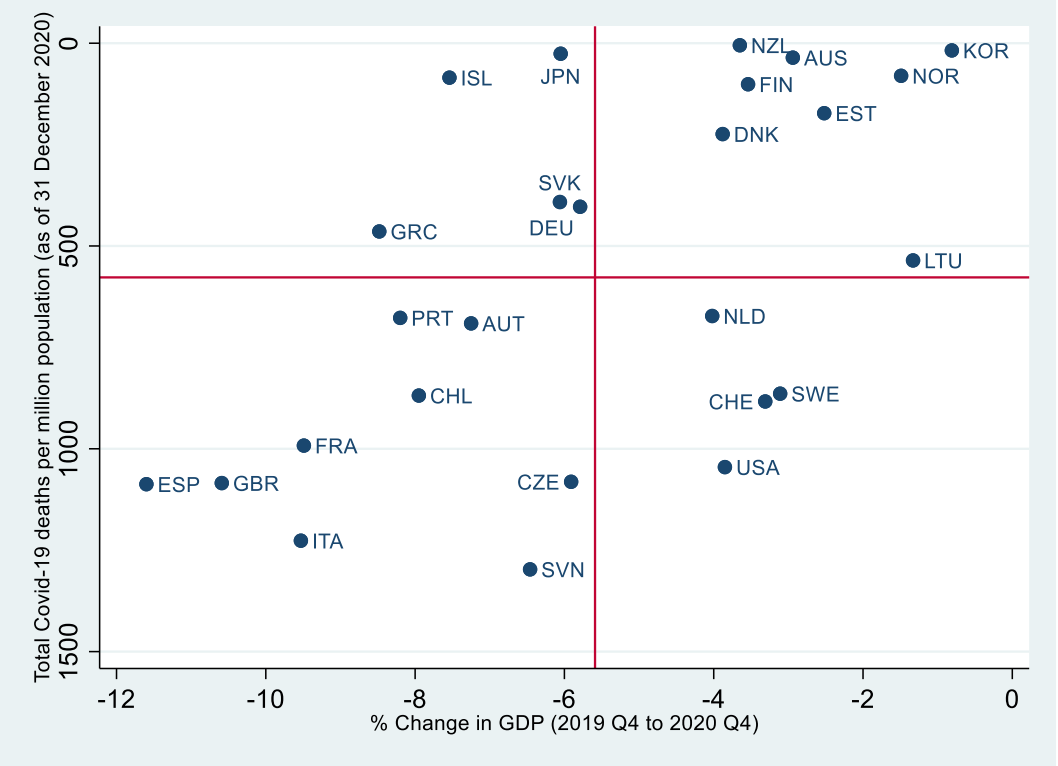
The COVID-19 policy outcomes in OECD countries during the third quarter of 2020 can be observed in Figure 4 in the health dimension, the sample average of the total COVID-19 deaths per million increased from 186.1 in the second quarter to 225.0 in the third quarter. In the economic dimension, the sample average of the percentage

[10] Our World in Data https://ourworldindata.org/coronavirus and OECD Data https://data.oecd.org/gdp/quarterly-gdp.htm#indicator-chart.

change in GDP compared to the previous period decreased from -11.1 in the second quarter to -4.25 in the third quarter. The severity of the pandemic in both dimensions was eased compared to that of the second quarter.

Among countries that belong to (d) pandemic policy optimization in the second quarter, only the Czech Republic, Iceland, and Japan shifted to (a) economy-sacrificing policy. In the case of (c) pandemic policy suboptimization, only France shifted to (b) health-sacrificing policy in the third quarter. Countries that shifted to (b) health-sacrificing policy in the second quarter did not make any changes in the third. The Slovak Republic, Slovenia, and New Zealand shifted to (d) pandemic policy optimization from the (a) economy-sacrificing policy and only Greece remained in the same category.

Figure 5. COVID-19 Pandemic Policy Outcomes in OECD Countries, 4th Quarter of 2020



Sources: Our World in Data and OECD

Figure 5 illustrates COVID-19 policy outcomes in OECD countries in the fourth quarter. In the health dimension, the sample average of the total Covid-19 deaths per million increased from 225.0 in the third quarter to 577.4 in the fourth quarter. The economic dimension experienced a decrease as the sample average of the percentage change in GDP dropped from -4.25 in the third quarter to -5.59 in the fourth quarter.[11]

In the fourth quarter, Germany and the Slovak Republic shifted to (a) economy-sacrificing policy, and Austria and Slovenia shifted to (c) pandemic policy suboptimization, instead of maintaining (d) pandemic policy optimization like in the third quarter. Countries that shifted to (c) pandemic policy suboptimization in the third

[11] As of January 24th, 2021, the data on the percentage change in GDP compared to the previous period is unavailable for the fourth quarter of 2020. Therefore, the average of percentage change in GDP in the first, second, and third quarter is used.

quarter remained in the same category. Compared to the third quarter, of the countries that shifted to (b) health-sacrificing policy, only France shifted to (c) pandemic policy suboptimization. Among those that shifted to (a) economy-sacrificing policy in the third quarter, only Portugal and Czech Republic shifted to (c) pandemic policy suboptimization.

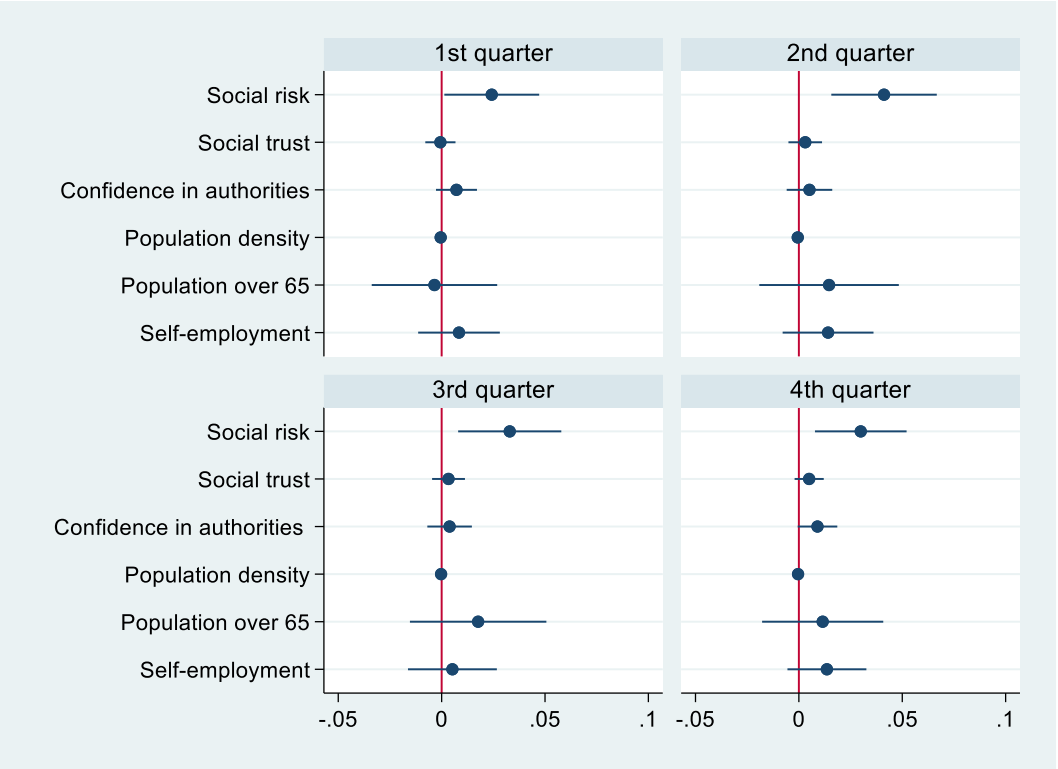
South Korea's Pandemic Policy in Comparative Perspective: A Statistical Analysis

A statistical analysis of the relationships between social risk, social trust, and confidence in authorities, and pandemic policy optimization will be discussed in this section. The dependent variable is the measure of COVID-19 pandemic policy optimization. This consists of the sum of the standardized score of the health and the economic dimensions per quarter.[12] For the variable of social risk, suicide rates are used as the proxy with the expectation that higher the social risk is in a country will lead to more facilitation of large-scale collective action.[13] The variable of social trust is based on the percentage of respondents who answered that "most people can be trusted" during the seventh wave of the World Value survey. It is expected that the higher the social trust is in a country, the more likely the free-riding problem will be overcome.[14] For the variable of confidence in authorities, the percentage of the respondents who chose "a great deal" and "quite a lot" to the question of how much confidence they have in the government in the seventh wave of the World Value Survey with the expectation that the higher the confidence in authorities, the more likely large-scale collective action is to be facilitated.[15]

In the analysis of the statistical models, three control variables are included: (1) population density with the expectation that the higher the population density, the more likely the virus will spread, and the less likely the pandemic policy optimization is to be implemented[16]; (2) the percentage of population ages 65 and above in the total population with the expectation that the higher the percentage of population over 65 is in a country, the more the total population is health-vulnerable, and the less likely the pandemic policy optimization is to be implemented[17]; and (3) the self-employment rate with the expectation that the higher the self-employment rate is in a country, the more the population is economy-vulnerable, and the less likely the pandemic policy optimization is to be implemented.[18]

[12] The total COVID-19 deaths per million is standardized from the minimum of 0 to the maximum of 1 and the value is reversed because the smaller number indicates a better outcome and the percentage change in GDP in previous period is standardized from the minimum of 0 to the maximum of 1. The COVID-19 pandemic policy optimization is the sum of the two standardized values.
[13] The data on suicide rates are derived from OECD Data https://data.oecd.org/healthstat/suicide-rates.htm.
[14] The data on social trust is derived from World Value Survey http://www.worldvaluessurvey.org/WVSOnline.jsp.
[15] The data on confidence in authorities is derived from World Value Survey http://www.worldvaluessurvey.org/WVSOnline.jsp.
[16] The data on population density is derived from World Bank Data https://data.worldbank.org/indicator/EN.POP.DNST.
[17] The data on population ages 65 and above is derived from World Bank Data https://data.worldbank.org/indicator/SP.POP.65UP.TO.
[18] The data on self-employment rate is derived from OECD Data https://data.oecd.org/emp/self-employment-rate.htm.

Figure 6. Determinants of COVID-19 Pandemic Policy Optimization



Notes[19]

An ordinary least square regression is utilized to estimate the statistical models and the results are reported in Figure 6. The first notable finding is that the results demonstrate a strong and positive correlation between social risk and pandemic policy optimization even after the inclusion of the social trust variable, the confidence in authorities variable, and other control variables. The social risk takes positive signs and highly statistically significant in the 1st quarter model through the 4th quarter model.

Analysis of social trust and confidence in authorities shows that contrary to conventional wisdom, they turn out to be statistically not significant. In addition, the other control variables prove to be statistically not distinguishable from zero. In fact, social risk is the only variable that has a statistically significant positive impact on pandemic policy optimization.

To sum up, the statistical analysis on the determinants of COVID-19 pandemic policy optimization confirms the theoretical prediction that the level of social risk is the most influential in explaining the performance of the COVID-19 policy, not social capital. In a time of crisis politics that is characterized by the high level of threat, time constraint, and uncertainty, the high level of preparedness and agility of citizens who are faced with a high level of social risk are the facilitators of large-scale collective action that induces voluntary civic compliance with the government NPIs policy. This was found to result in the successful optimization of the pandemic policy between

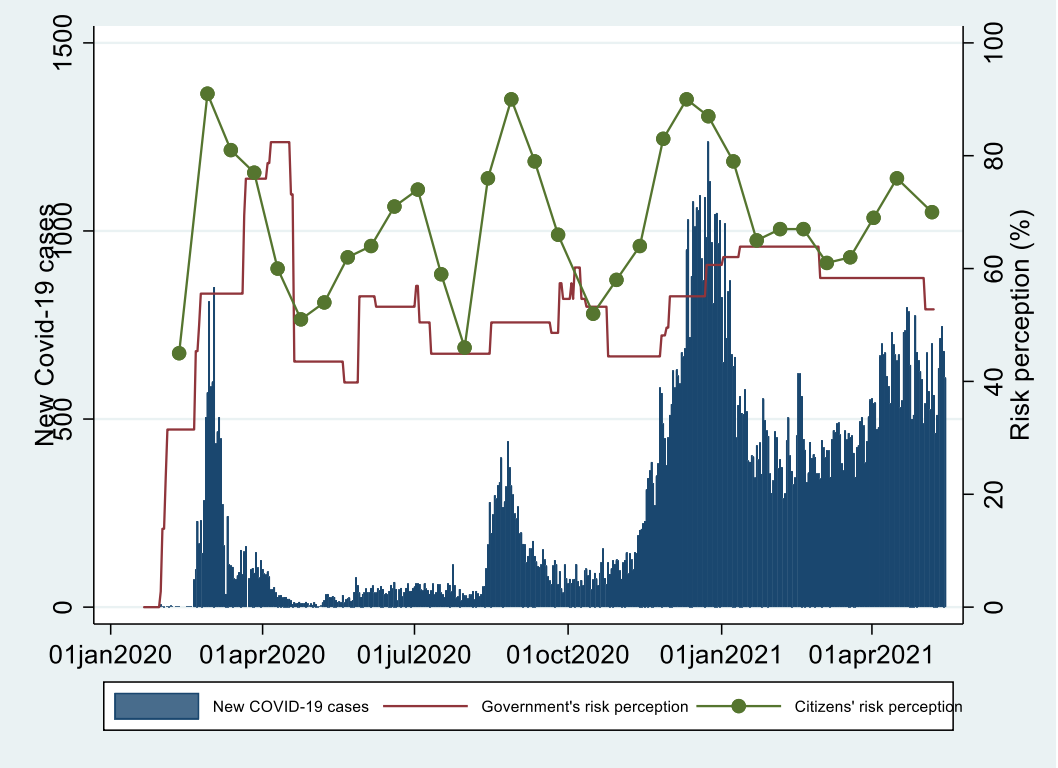
[19] Number of observations: 26; R-squared: 0.38 in 1st quarter model; 0.46 in 2nd quarter model; 0.41 in 3rd quarter model; and 0.57 in 4th quarter model.

health and the economy.

South Korea's Pandemic Policy as a Case Study: A Descriptive Exploration

This section tests the large-scale collective action based on the social risk hypothesis on pandemic policy optimization, by studying South Korea as a case. For starters, it shows that civil agility is higher than government agility to the change of new COVID-19 cases, tracing their risk perceptions of the pandemic. Second, it reveals that rational fear is the main driving force that makes large-scale collective action possible, examining the reasons behind the compliance with the social distance recommendations. Lastly, it demonstrates that the risk of contagion is the most important variable that induces voluntary civic compliance with NPIs policy through statistical analysis.

Figure 7. Risk Perceptions and New COVID-19 Cases in South Korea



Sources: Our World in Data and Hankook Research[20]

Figure 7 illustrates how risk perceptions of the government and citizens of new COVID-19 cases have changed from January 21, 2020, to May 15, 2021, in South Korea. The bar graph illustrates new COVID-19 cases.[21] The line graph indicates the risk perception of the government, which is measured by the 'government stringency index' based on nine response indicators including school closures, workplace closures, and travel bans rescaled to

[20] New COVID-19 cases and government's risk perception: Our World in Data https://ourworldindata.org/coronavirus; Citizen's risk perception: Hankook Research https://hrcopinion.co.kr/archives/series/covid-19.
[21] The data on new COVID-19 cases is derived from Our World in Data https://ourworldindata.org/coronavirus.

a value from 0 to 100 (100 = strictest).[22] The circle-maker line graph shows the risk perception of citizens, which is measured by the sum of the percentage of respondents who answered that "it is severe" or "it is very severe" to the question that "how severe do you think the spread of COVID-19 is in the country?" during the thirty-two waves of Hankook Research surveys from January 2020.[23]

For starters, it is possible to confirm that there have been four COVID-19 waves since January 2020. The first wave peaked on March 3, 2020, in which new COVID-19 cases rose to 851. The second wave peaked on August 26, 2020, when new COVID-19 cases rose to 441. The third wave peaked on December 24, 2020, when new COVID-19 cases rose to 1,237. The fourth wave peaked on April 22, 2021, when new COVID cases rose to 797.

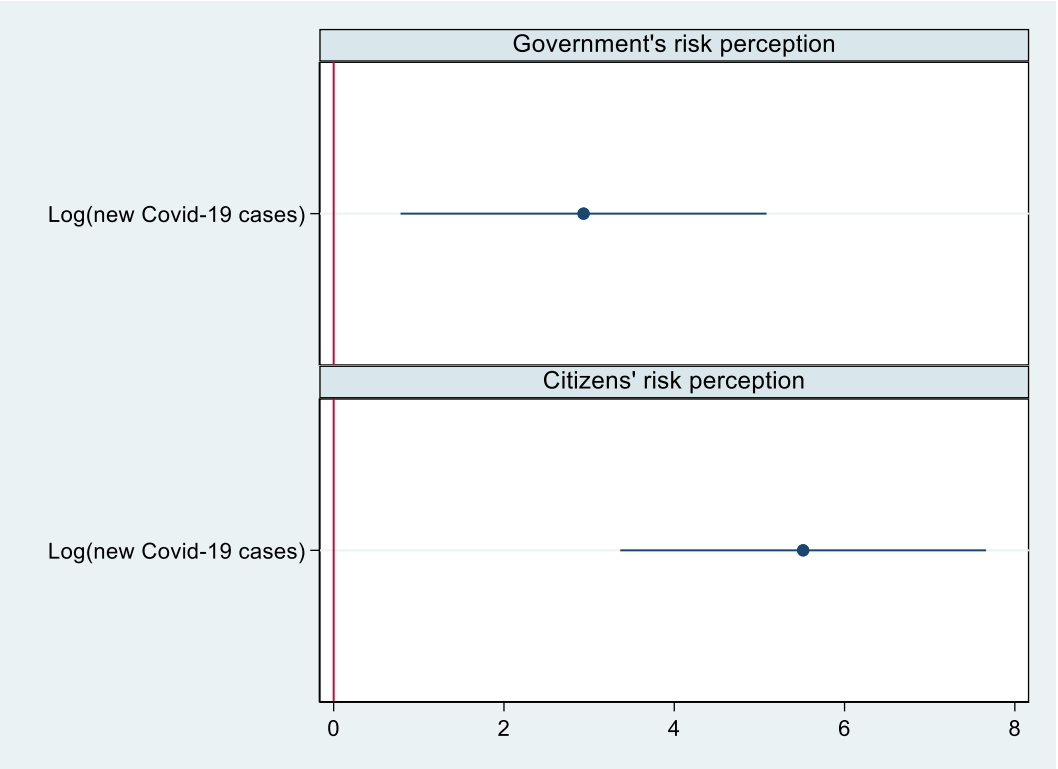
Second, the risk perception of the government, scoring 55.56 on March 3, 2020, took 34 days to reach the highest point of 82.41 on April 6, 2020, during the first wave. Scoring on 50.46 on August 26, 2020, it took 40 days to reach the highest point of 60.19 on October 5, 2020, during the second wave. From 60.65 on December 24, 2020, it took 19 days to reach the highest point of 63.38 on January 12, 2021, during the third wave. It took an average of 31 days for the risk perception of the government to catch up with the peaks of COVID-19 waves. In the fourth wave, the risk perception of the government was 58.33 on April 22, 2021, even declining to the point of 52.78 on May 3, 2021.

Third, during the first wave, the risk perception of citizens reached 91% on February 28, 2020, three days before the peak point of new COVID-19 cases, declining to 60% on April 10, 2020, four days after the highest point of risk perception of the government. During the second wave, it reached 90% on August 28, 2020, two days after the peak point of new COVID-19 cases, declining to 52% on October 5, 2020, when the risk perception of the government was on the highest point. In the third wave, it reached 87% on December 24, 2020, when new COVID-19 cases rose to the highest point, declining to 79% on January 12, 2021, four days before the highest point of risk perception of the government. During the fourth wave, it reached 76% on April 16, 2021, six days before the peak point of new COVID-19 cases, declining to 70% on May 7, 2021, four days after the government lowered its risk perception. Compared to the risk perception of the government that shows some time lag between its rise and the peaks of the waves, the risk perception of citizens corresponds in large part to the change of the waves.

Figure 8 illustrates regression coefficients of (logged) new COVID-19 cases on the risk perception of the government and that of citizens. The regression coefficient of (logged) new COVID-19 cases on the risk perception of the government is 2.93 with statistical significance at .01. The regression coefficient of (logged) new COVID-19 cases on the risk perception of citizens is 5.51 with statistical significance at .00. It is clear that citizens respond to the change of new COVID-19 cases in a more agile way than the government does.

[22] The data on the risk perception of the government is derived from Our World in Data https://ourworldindata.org/coronavirus.
[23] The data on the citizens' risk perception is derived from Hankook Research https://hrcopinion.co.kr/archives/series/covid-19.

Figure 8. Agility to New COVID-19 Cases in South Korea



Notes[24]

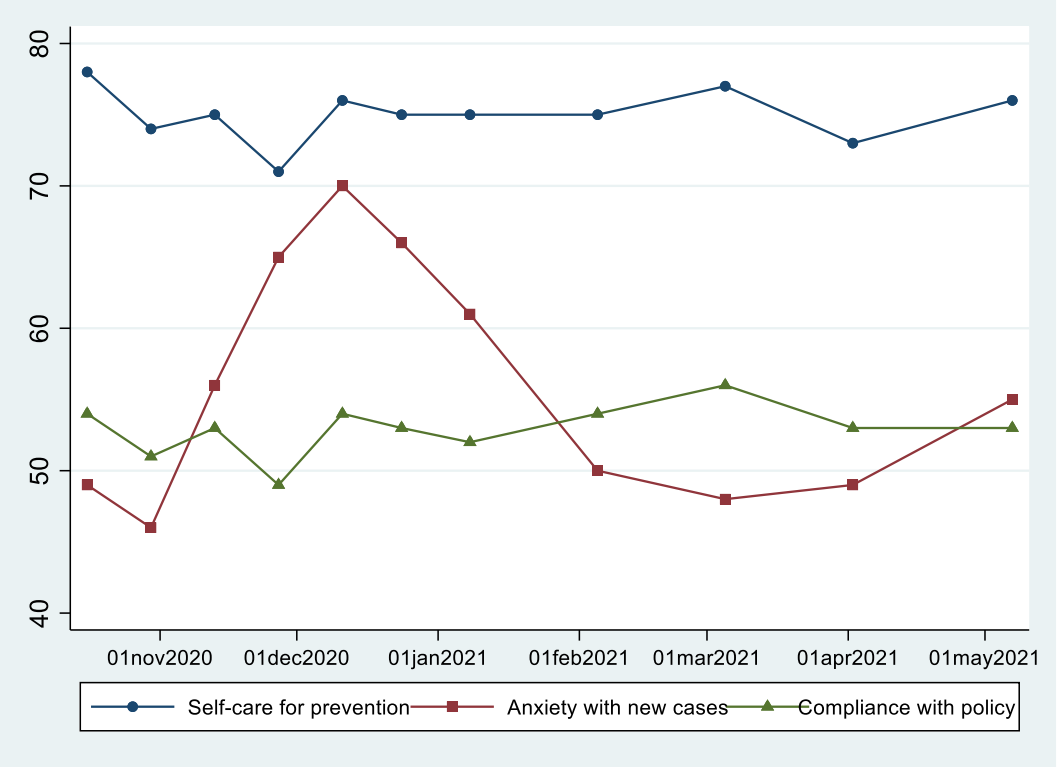
These findings imply that the agile response of the government is key to the successful testing and quarantine dimension of NPIs policy while the voluntary compliance of citizens is vital to the successful social distancing and personal hygiene dimension of NPIs. If the government, facing the COVID-19 wave, swiftly adjusted its NPIs policy stringency to the point of temporary lockdown policy, the consequence could have been economy-sacrificing policy outcomes. The voluntary civic compliance with NPIs policy on the dimension of social distancing and personal hygiene bridges the gap in the delay of the government responses on the dimension of testing and quarantine. This is why research that explains that South Korea's pandemic policy optimization was mainly due to the agile policy response is incomplete at best (Cha 2020; Lee, Hwang, and Moon 2020; Moon 2020; Oh 2021).

Figure 9 shows the survey results of the reasons for complying with social distancing measures during the eleven waves of Hankook Research since October 2020. The circle-maker line graph captures the percentage of respondents who answered "self-care for prevention," the square-maker line graphs those who answered "anxiety with new cases," and the triangle-maker line graphs those who answered "compliance with policies." The average percentage of those who answered "self-care for prevention" is 75.0% while that of those who answered "compliance with policy" is 52.9%. A two-tailed t-test shows that the means of the two sample is different with statistical significance at .00. In addition, the changes in the percentage of those who answered "anxiety with new

[24] Number of observations: 32; R-squared: 0.20 in government's risk perception model; 0.47 in citizens' risk perception model.

cases" corresponds in large part to the movement of the third and fourth COVID-19 waves, which implies that the sensitivity of citizens to the risk of contagion is the main drivers for complying with social distancing measures.

Figure 9. Reasons for Complying with Social Distancing Measures in South Korea



Sources: Hankook Research[25]

South Korea's Pandemic Policy as a Case Study: A Statistical Analysis

Figure 10 shows the results of ordered logistic multivariate regression on the compliance with "stay-at-home order," "ban on religious gathering," "restrictions on economic activities," and "restrictions on liberties," assigning 1 to "greatly oppose," 2 to "oppose," 3 to "support," and 4 to "greatly support."[26]

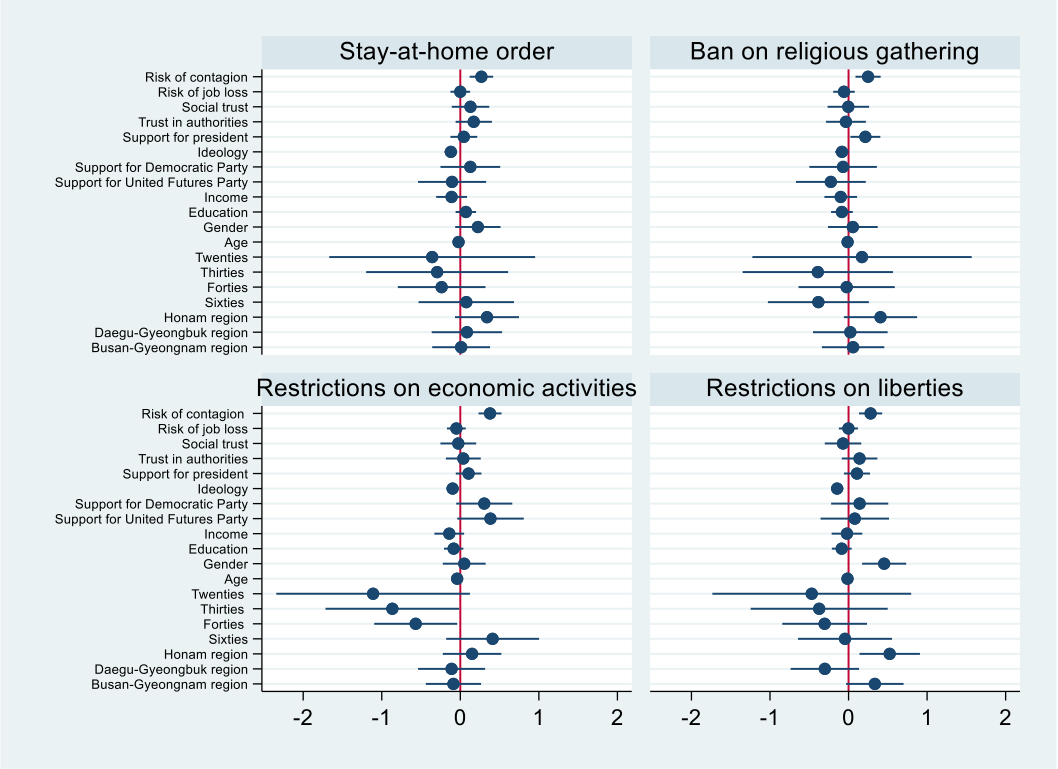
Above all, the risk of contagion has a positive effect on compliance with stay-at-home order, the ban on religious gathering, restrictions on economic activities, and restrictions on liberties with statistical significance at .05. The higher an individual perceives the risk of contagion, the more supportive s/he is to varieties of NPIs policies. The finding corroborates the hypothesis that large-scale collective actions based on social risk was the key to pandemic policy optimization in South Korea.

Social trust and trust in authorities have no effect on compliance with any categories of pandemic policies. The finding refutes the validity of the social capital-based explanation for pandemic policy optimization in South

[25] Hankook Research https://hrcopinion.co.kr/archives/series/covid-19.
[26] The survey was designed by Social Science Korea research team on the quality of government and varieties of governance and conducted by Hankook Research between August 19, 2020 and August 24, 2020.

Korea.[27]

Figure 10. Determinants of Compliance with Pandemic Policies in South Korea



Notes[28]

Conclusion

This study addresses questions of how policymakers and citizens solved the trade-off between health and the economy during the COVID-19 pandemic and why national performances have varied in responding to the challenges among advanced industrial democracies.

Contra conventional wisdom, this study insists that social risk, rather than social capital such as social trust or confidence in authorities, explains the variation of national policy responses to the trade-off between lives and livelihoods. To prove its argument, this study first offers a descriptive comparison across OECD countries over quarterly periods in 2020 in order to ascertain pandemic policy overperformers and underperformers. The research

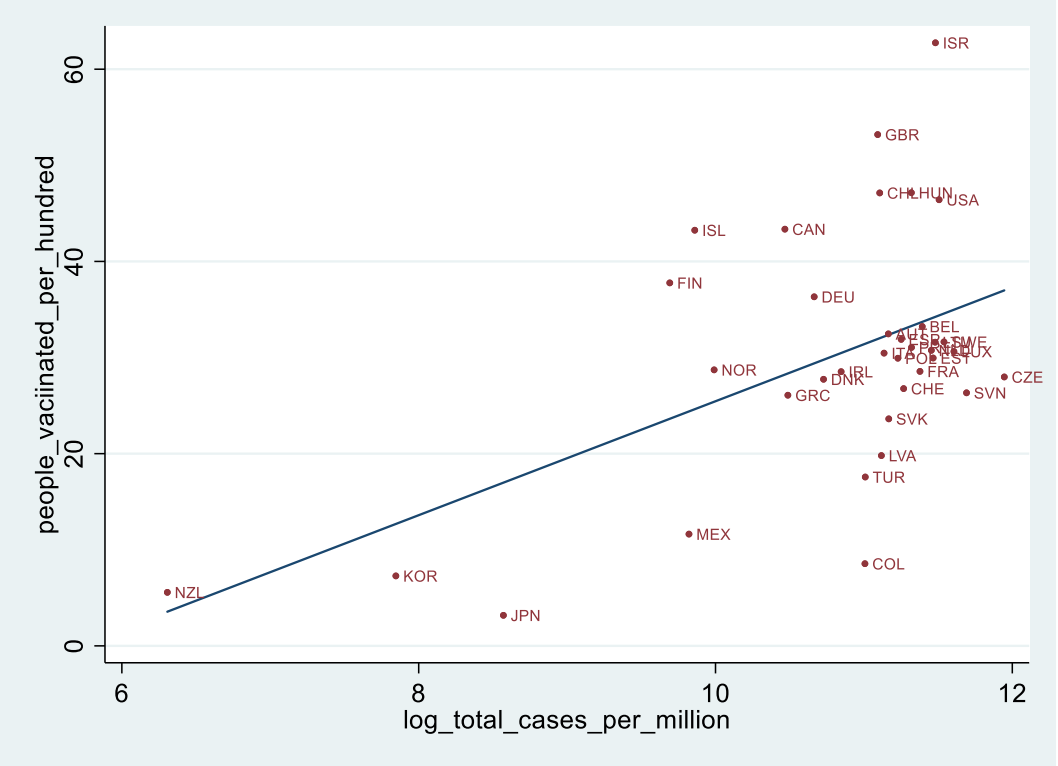
[27] Of control variables, ideology has a negative impact on the compliance with all pandemic policy with an excpetion to the ban on religious gathering. The more conservative an individual perceives in her/his ideological self-placement, the less supportive s/he is to most NPIs policies. Support for the president has a positive effect on the compliance with ban on religious gathering. The more an individual is supportive of the president, the more s/he is willing to sacrifice her/his religious liberties. Compared to individuals in their fifties, those in their thirties and forties are less supportive to the compliance with the restrictions on economic activities. Compared to individuals who are born in non-Honam and non-Youngnam regions, those who are born in Honam region are more supportive to the compliance with the restrictions on liberties. Compared to male individuals, females are more supportive to the compliance with restrictions on liberties. All the other variables, including party support, income, education, age were not found to be statistically significant.

[28] Number of observations: 895; log-likelihood: -746.63 in stay-at-home order model; -689.47 in ban on religious gathering model; -887.76 in restrictions on economic activities model; and -814.47 in restrictions on liberties model.

then provides a statistical analysis in which the determinants of COVID-19 pandemic policy optimization are examined. The descriptive and statistical investigations confirm the argument of this study that social risk is the main factor of large-scale collective action that accounts for the variation of national pandemic policy performances.

This study traces the risk perceptions of the government and citizens in South Korea to the COVID-19 waves, finding that the agility of citizens to the spread of COVID-19 is key to the successful pandemic policy optimization. It also reports the results of a statistical analysis in which the determinants of voluntary civic compliance with NPIs policy, showing that the risk of contagion, rather than social trust or trust in authorities, is one of the most decisive factors that explain how large-scale collective actions are possible in South Korea in responding COVID-19 pandemic crisis. ■

Appendix. Association between Total COVID-19 Cases and Vaccination in OECD Countries



Sources: Our World in Data[29]

[29] Our World in Data https://ourworldindata.org/coronavirus.

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