

Kim, Moon Jung; Lee, Soohyung

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Can Stimulus Checks Boost an Economy under COVID-19? Evidence from South Korea

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Moon Jung Kim

Korea Institute of Public Finance

Soohyung Lee

Seoul National University and IZA

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IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Can Stimulus Checks Boost an Economy under COVID-19? Evidence from South Korea*

Various countries have implemented transfer programs to individuals since the Covid-19 outbreaks. However, the extent to which such transfers alleviate economic recessions is unclear. This paper analyzes a South Korean program, which provided vouchers redeemable only at small local businesses. We find that, due to the program, over 30% of households across all income groups increased their food and overall household spending, but the usage restriction may have affected consumer choice, distorting business competition. While the employment and sales of small businesses improved, the program's fiscal sustainability is in question because of the large tax exemption.

JEL Classification: H2, H6, D3, D6, L1

Keywords: COVID-19, stimulus payment, universal transfers, consumption, distortion

Corresponding author:

Soohyung Lee
Seoul National University
1 Gwanak-ro, Gwanak-gu
Seoul 08826
South Korea
E-mail: soohlee@snu.ac.kr

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I. Introduction

The Covid-19 pandemic has been gravely affecting economies around the world, leading to soaring unemployment in many countries. As a tool to promptly relieve economic distress, there have been demands for direct transfers to individuals or households (IMF 2020). Countries adopting such a scheme include Hong Kong, Japan, Serbia, Singapore, South Korea, and the United States (OECD, 2020, IMF 2020). Although such transfers certainly benefit households, it is unclear to what extent they affect household consumption and, consequently, support businesses. For example, consumption responses crucially depend on marginal propensities to consume (Baker et al., 2020). Furthermore, the Covid-19 transfer programs may have different effects on employment and businesses relative to the transfer programs used in other recession periods because, to avoid infection, people may not consume as much and may change their consumption behaviors as well (see Chetty et al., 2020, for a US study).

This paper conducts empirical analyses to gauge the effect of Covid-19 transfers using the South Korean case. In May 2020, the Korean government introduced a one-time universal transfer scheme whose stated goal was to promote consumption and help small businesses as well as their employees. The government distributed vouchers to all households, redeemable only at small-sized establishments located in their neighborhoods until August 2020. The voucher amount depended on the number of household members and their residence. On average, a three-person household received vouchers worth US\$799 (1.7% of the annual household income in 2019).

Instead of waiting for standard labor and household data to become available, we use two complementary methods to preliminarily assess the effects of consumption vouchers. First, we use a survey of 2,000 households to assess whether the transfer scheme actually increased consumption, one of the policy goals. The survey inquires about the amount of vouchers households received, their usage, and changes in household consumption and savings. Survey responses show that, thanks to the consumption vouchers, over one-third of households increased their food and household spending and a quarter of households increased their total spending. The share of households increasing consumption and total spending is comparable across all income groups. Those increases in consumption and total

spending were not large enough to decrease savings for most households (89%). The majority of the households reported difficulty using all the vouchers at local small-scale businesses. We interpret this response as evidence suggesting that the usage restriction may distort consumer choice, weakening online-based or large-scale stores relative to small offline businesses. Finally, we acknowledge that these survey responses may not accurately reflect causal effects of the voucher program and that the limited information from the survey prohibits us from evaluating the policy effects on businesses and their employees, another policy goal. We address these limitations using a second method.

Our second method is to infer the policy effects on businesses by examining a precedent local policy that serves as a prototype of the Covid-19 voucher scheme. The Covid-19 scheme adopted key features of the local policy introduced by the Seongnam municipal government in 2016, and expanded the coverage to all citizens. In fact, the two policies are comparable in terms of the amount of transfers per eligible household and the limited use of vouchers to small-sized local businesses. Using a differences in differences (DID) method, we find that the 2016 policy was effective in increasing the number of employees of businesses hiring fewer than 5 full-time workers (on average 2.9% in 2016 and 2017). Its impact on sales is positive (5%) but not statistically significant at conventional levels. If our findings are applicable to the Covid-19 transfer program, then the program may support small businesses by maintaining their employees and sales. However, these effects are not likely to generate tax revenues because a large share of workers and small businesses are granted tax exemptions or are subject to lower tax rates.

In summary, our findings point out the possibility that the Covid-19 transfer program in South Korea may be effective in increasing consumption and helping small businesses retain their workers, but its fiscal burden and possible distortionary effects call for further examination of how to design policy details and for careful analysis of its merit relative to other existing policy instruments.

II. Institutional Background

II.1 Overview of the Covid-19 Outbreak and Policy Responses

In South Korea, the first Covid-19 case was confirmed on January 20, 2020. One month later, rapid increases in the number of cases followed (Park et al., 2020). See Figure 1 in the Online Appendix. The South Korean government promptly responded to the Covid-19 pandemic by establishing a Covid-19 rapid response team, tracking down patients and those with whom they were in contact, and disinfecting the places the patients visited (KCDC, 2020). Although South Korea has never imposed a large-scale lockdown, concern over a Covid-19-induced economic recession made the central government and bank introduce various stimulus packages starting on February 5, 2020. The packages consist of typical fiscal and monetary policies against recessions, such as lowering interest rates, providing credit lines to businesses, and increasing government expenditures (MOEF, 2020).

The Korean government decided to provide one-time universal transfers to households in order to boost consumption and to support small-sized businesses and their employees, which were especially vulnerable to a sales decline induced by Covid-19. Such transfers to all citizens are unprecedented in South Korea, so they provoked serious political debates and opposition until their approval on April 30, 2020. The only existing policy close to the universal transfers is the 2016 local policy adopted by the municipal government of Seongnam. In fact, the Covid-19 transfer scheme is modelled after the 2016 local policy, and the two policies share many similarities, as discussed below.

II.2 Consumption Voucher Schemes in 2016 and 2020

Political Landscape

The South Korean government consists of three layers. Municipal governments, a total of 226, are the smallest unit of government that has discretion over tax revenues and budgets, within the boundaries set by their supervising authorities, namely regional governments, and ultimately by the central government. See Section 1 of the Online Appendix. South Korea has a relatively short history of regional autonomy, and the regional and municipal governments heavily rely on transfers from the

central government.¹ For this reason, municipal and regional governments generally follow the policy guidelines set by the central government.

In the mid-2000s, the possibility of adopting universal transfers had been discussed as a tool to address poverty among the elderly, and again, ten years later, to help young adults escape joblessness. However, the Korean central government had been reluctant to accept such an idea, and no regional or municipal government had gone against the central government's stance. A very notable and highly controversial exception is the municipal government of Seongnam, home to 1 million residents, ranked 12th largest city in Korea in terms of population size and 10th in terms of local tax revenues in 2019. In September 2015, the mayor of Seongnam signed a bill to provide an unconditional transfer each quarter, worth US\$ 207 each, to 24-year-old residents, starting from 2016. The bill was founded upon the idea of a universal basic income but restricted to those age 24, due to fiscal capacity constraints.² Although the transfer was given to 24-year-olds, its economic effect may be comparable to a transfer to a household with one 24-year-old because in Seongnam, and also in Korea overall, almost all 24-year old adults live with and rely on their parents for a living, without full-time jobs. According to a survey of over 495 individuals aged 24 who received the Seongnam voucher in 2016, 92% lived with their parents, and they used the vouchers on food and household spending (66%) or gave the vouchers to family members (20%) (IGT, 2016).

The political environment in Korea explains why the 2020 consumption voucher scheme was designed after, and thus is comparable to, the Seongnam 2016 policy. As the Covid-19 pandemic started to spread around the world and its negative impact on the global economy became prolonged, political calls for income support to households, such as the 2016 Seongnam scheme, arose in South

¹ In 1995, South Koreans started to elect the heads of regional and municipal governments. Since then, certain types of taxes have been converted from national taxes to regional or municipal taxes. However, national tax revenues are the dominant source of government finances. For example, in 2018, 78% of tax revenues was from national taxes while only 22% was from regional or municipal taxes. For details see <http://theme.archives.go.kr/next/localSelf/process.do>. The composition of national and regional taxes is available at http://www.index.go.kr/potal/main/EachDtlPageDetail.do?idx_cd=1123.

² The central government rejected that bill in December 2015, but Seongnam nonetheless provided the vouchers as planned in 2016. The central government took the case to court, but the lawsuit was eventually dropped when President Park Geun-hye was impeached in March 2017, and President Moon Jae-in, who belongs to the same political party as Mr. Lee, became president.

Korea. Mr. Lee Jae-myung, the current governor of Gyeonggi Province and the former mayor of Seongnam who adopted the 2016 scheme, announced his plan to expand the Seongnam consumption voucher scheme to all residents of Gyeonggi on April 1, 2020 and started to distribute the vouchers on April 9. Gyeonggi Province, surrounding Seoul, is Korea's most populated region, home to over a quarter of South Koreans, and it supervises 31 municipal governments, including Seongnam. While the central Korean government was initially reluctant to implement such policies because of their fiscal burden, it yielded and adopted a consumption voucher scheme that was effectively the same as the Gyeonggi plan; it started to distribute the vouchers on May 4.

Consumption Vouchers

Under the 2020 voucher scheme, all South Koreans are entitled to the consumption vouchers from the central government, while some may receive additional vouchers from their municipal and/or regional governments. For the former, the voucher transfers are given to the head of a household, and the amount depends on the number of household members. For a three-person household, the central government provides approximately US\$664.³ Of the 22 million households in South Korea, 99.5% received consumption vouchers from the central government by June 7, 2020 (MOIS, 2020). In addition, 2 regional and 47 municipal governments provided vouchers to their residents, ranging from US\$83 to US\$332 per person.⁴ In total, a family of three, on average, received a total amount of vouchers worth US\$799. Consumption vouchers cannot be cashed, expire on August 31, 2020, and can be used within the residential areas. Specifically, even if the central government provides the vouchers, a person can use them in the region he/she lives in (i.e., metropolitan or province). Vouchers provided by a regional or municipal government must be used within the municipal area of residence.

³ We convert 1,000 Korean won into 0.83 US dollars based on the average exchange rate between January and May 2020. As the average number of household members is 2.57 persons in the 2015 population census, we choose a three-person household as an example to calculate the amount of the consumption vouchers.

⁴ For example, residents of Seongnam are given vouchers by the central government, by the Gyeonggi regional government (US\$83 per person), and by the Seongnam government (US\$83 per person), while the transfer from the central government is netted out by the Gyeonggi regional government's contribution (20% of the voucher).

Retail businesses that accept credit or check cards are eligible for the consumption vouchers. Exceptions include bars, clubs, online stores, and large-sized retail stores.⁵

The Korean policy shares similarities with Japan's 1999 shopping coupon program and Taiwan's 2009 shopping voucher scheme. But different from the Korean program, only a quarter of Japanese households were eligible for the Japanese program, and the Taiwanese plan did not restrict usage to small-sized local businesses (see Kan et al., 2017, and Hsieh et al., 2010).

Key features of the 2020 voucher scheme are shared by the 2016 Seongnam scheme, such as eligibility without means testing and limitations on usage to small businesses in one's area of residence. The value of the vouchers per eligible household is comparable – for a three-person family, US\$799 in 2020 vs. US\$828 in 2016.⁶ There are two notable differences. The total amount of the Covid-19 vouchers is much higher compared to the 2016 Seongnam vouchers because of universal eligibility. For example, in 2016 the Seongnam municipal government spent US\$9 million for consumption vouchers, while the Covid-19 vouchers are worth US\$11 billion, distributed across the entire country. The other difference is that the Covid-19 voucher scheme imposed a three-month expiration (August 31, 2020), while the 2016 scheme did not impose such an immediate expiration date. Given the lack of data directly evaluating the Covid-19 scheme, we think empirical findings based on the 2016 policy can serve as an educated guess about the policy effects from the Covid-19 transfer scheme. For a detailed comparison of the two schemes, see Section 2 of the Online Appendix.

III. The Effect of the Covid-19 Consumption Vouchers

III.1 Evidence from Survey Results

Data Source

We were granted access to a survey conducted by the Korea Institute of Public Finance (KIPF) between June 26 and July 1, 2020. The survey includes 3,672 adults, but yields a sample of 2,000 valid

⁵ These large-sized retail stores include department stores, Costco, E-mart (a Walmart-equivalent in South Korea), and other stores whose annual sales are over US\$0.83 million.

⁶ The value of the 2016 Seongnam transfer is US\$862 in 2020 with inflation adjustment between 2016 and 2020.

participants who are either the head of the household or the spouse. The survey sample is highly comparable to the overall Korean population except for an over-representation of college graduates. See details in Section 3 of the Online Appendix.

Consumption Vouchers and Usages

The survey participants received consumption vouchers worth on average US\$873 (\$629 from the central government and \$244 from the regional or municipal government), and 86% of participants had already spent over 70% of their vouchers by the time they participated in the survey. The survey asks participants whether they increased, decreased, or maintained their consumption spending, total spending, and savings since the Covid-19 outbreak started. All except for 49 participants answered the questions. Compared to their spending prior to the Covid-19 pandemic, 36% of respondents increased their consumption spending, and 26% increased their total spending including both consumption and non-consumption spending. The gap between these two types of spending suggests a reduction in non-consumption spending, which is also documented in the recent report by the Korean Statistics Bureau (SK, 2020). If, holding income constant, the increase in total spending exceeds the value of vouchers a household received, then household savings will decrease. In our survey, such a case is reported by 11% of participants. These findings suggest that the voucher scheme successfully increased consumption spending among 36% of the households, and total spending to a lesser extent (29%), but the magnitude of the spending increase did not exceed the value of the transfers, leading to only 11% of households having a smaller amount of savings. Our findings remain qualitatively the same if we focus only on the 78% of the households whose income remained comparable before and after the pandemic started.

As for the use of vouchers, 82% of people used vouchers to purchase necessities that they regularly consume. In fact, the most frequent places they used vouchers are groceries (46%), followed by restaurants (24%), then pharmacies and hospitals (12%). In line with our findings, those three consumption categories account for 59% of voucher spending between May 9 and May 31, 2020 (MOIS, 2020b). In the US, upon receiving a 2020 stimulus check, households significantly increased

spending on food, household goods and personal care (Baker et al., 2020). This pattern echoes what we find in South Korea.

Next, we examine the relationship between income and propensity to consume more with the vouchers. We divide households into 6 groups based on current monthly income and plot the changes in household expenditures after the voucher scheme was introduced (Panels A to C of Figure 1). Group 1 refers to the lowest income group, while Group 6 refers to the highest.⁷ We find no strong evidence suggesting that propensity to increase spending due to vouchers is larger among low income earners. See the Online Appendix (Section 3, Table 3.4) for details of the statistical tests.

Finally, the survey participants were asked if they had any difficulty using the vouchers. The majority of participants expressed their wish to spend the vouchers at online and large-scale stores (45%), or stores located in other regions (10%), while 43% reported no complaints about the usage restrictions. We regard these wishes as suggestive evidence of possible distortionary effects of voucher schemes in terms of the size and location of the establishments. Although the number of large-scale establishments (100 or more fulltime workers) is small (1.3%) in Korea, they account for about 50% of employment and exhibit higher compensation and productivity than small-scale ones. Thus, a distortionary policy promoting small-scale establishments in place of large-scale ones could harm overall productivity and labor income in the long run.

III.2 Evidence from the 2016 Consumption Voucher Scheme

Data and Sample

We use two types of limited-access administrative datasets, provided by the National Employment Insurance (NEI) and the National Tax Bureau (NTB). The NEI uses the information on workers who register for national employment insurance, covering 50% of those who had a job in 2019.⁸ Then, the

⁷ We divide households into 6 groups based on their monthly income: up to 199 million won (US\$ 1,654, Group 1), 200 to 299 million won (Group 2), 300 to 399 million won (Group 3), 400 to 499 million won (Group 4), 500 to 699 million won (Group 5), and equal to or more than 700 million won (Group 6).

⁸ Temporary employees and self-employed individuals can sign up for national employment insurance, while wage earners are required to sign up. As of August 2019, the share of those who signed up for the NEI was 50.36% among all workers and 67.02% among all workers excluding the self-employed.

NEI compiles a database including the *monthly* information on establishments, their locations, industries, and the number of employees.⁹ Using the tax files for value-added taxes (VAT), the NTB selects a 10% random sample of establishments, and constructs a *yearly* dataset of establishments, their locations and the amount of sales, but not the number of employees. Note that tax filing is mandatory for all establishments with taxable sales, which included 88% of establishments in Korea during our sample period. We use the NEI data to estimate the impact on employment, while the NTB data is used to measure the effect on firm's performance, measured by sales.

Over the period from 2015 to 2017, we analyze the information on small establishments that hired fewer than 100 full-time workers for the NEI, and that are sole proprietorships, instead of corporations, for the NTB. We exclude large-scale businesses, which account for 1.3% of the establishments and 49.2% of employment, because rather than targeting local consumers, they may address clients across South Korea and internationally. The unit of observation is the district by time (defined by month and year for NEI and year for NTB). For each observation, we have the number of employees and total sales of small establishments. Finally, we narrow down our sample to 20 districts (18 municipalities) – 3 districts in Seongnam and 17 districts that are comparable to the 3 Seongnam districts with respect to the demographic characteristics of their residents.¹⁰ This restriction helps us estimate the causal effect of the 2016 policy using the Differences in Differences (DID) strategy.

Econometric Framework and Identification Strategy

We conduct a DID estimation to measure the causal effects of the 2016 voucher program on economic outcomes:

⁹ There are other datasets we could have used to examine employment but decided not to use. For example, we do not use the monthly survey of labor supply, conducted by the National Statistics Bureau, because it does not provide information on the work place (e.g., location and type). All other surveys of establishments collected by the Ministry of Labor are yearly or half-yearly, which dramatically reduces the sample size, and masks the effect of the treatment.

¹⁰ We combine the 2015 census and the 2015 NEI dataset to construct the district-level data. The dataset contains for each district information on number of residents, age composition of residents (5 groups: 19 or less, 20-39, 40-59, 60-69, 70 or more), share of women, share of those who are working (i.e., workers), the age (5 groups), education, occupation, and industry of the workers. We then estimate an OLS model by regressing the treatment status on the district-level characteristics and selecting the top 20 districts, including the three districts of Seongnam, from the highest predicted probability. Details are in the Online Appendix (Section 4).

$$Y_{d,m,t} = \theta \cdot \mathbb{1}(d \in \text{Treat}; t \in \text{Post}) + \alpha_d + \beta_t + \varepsilon_{d,m,t} \quad (1)$$

where $Y_{d,m,t}$ is an outcome variable of district d , municipal m , and time t . Variable $\mathbb{1}(d \in \text{Treat}; t \in \text{Post})$ is one if residents in district d are eligible for consumption vouchers at the time t , and zero otherwise. Parameters α_d and β_t capture district- and time-fixed effects. Variable $\varepsilon_{d,m,t}$ captures unexplained random shock, clustered at the municipal level, as it is the unit of determining local taxes and consumption vouchers. Our identifying assumption is that, absent the 2016 voucher program, the trends in economic outcomes would have been the same in both the treatment and control groups.

Using the monthly data of the NEI, we conduct a falsification test to examine the plausibility of our assumption. We restrict our sample to the pre-recession period (January to December 2015) and estimate equation (1) including the interaction effects between the treatment group and the dummy indicating the second half of 2015. If the two groups share the same time trend, then the interaction effects should not be different from zero, which indeed we find. Panel A, Column 1 of Table 2 reports the results. Note that we could not conduct the same test for sales, as the NTB data is yearly and we have only one pre-treatment period.

Estimation Results

Table 2 reports the results: Panel A for employment effects, Panel B for effects on sales, columns (2) to (5) for the immediate effect in 2016, and columns (6) to (9) for effects for two years (2016-2017). The estimated effects substantially vary by time span and type of establishment. However, two patterns are robust. First, due to the 2016 policy, establishments hiring fewer than 5 full-time workers, namely mom-and-pop stores, increased their employees by 2.8 in 2016 and 2.9 percent between 2016 and 2017, both statistically significant at the 5% level. Second, we do not have a strong evidence suggesting that the 2016 voucher scheme increased the amount of sales. Although the point estimates suggest a 5.9% and 5.0% increase in sales, the effects are not statistically significant at conventional levels. It is still possible that the voucher scheme may increase sales of establishments with fewer than 5 full-time workers, but we cannot directly test that hypothesis because the NTB data does not include the size of establishments.

Back-of-the-Envelope Calculation

Using a back-of-the-envelope calculation, we examine the economic importance of the estimated effects. The voucher program increased the employment by mom-and-pop stores by 2.8% in 2016. This increase implies 797 more individuals were employed, which is 0.16% relative to the total number of workers in Seongnam. This magnitude is sizable, considering the fact that from 2015 to 2016, the number of workers in Seongnam increased only by 0.8% (3,950 persons). Furthermore, applied to minimum wage rates with full-time jobs, that increased employment is worth US\$10.0 million, exceeding the total spending by the Seongnam municipal government for the program (US\$8.7 million). The increased employment may not be able to generate more revenues from labor income taxes because many employees, including full-time workers with minimum wage rates, are exempt from taxes under the current tax system.¹¹

VI. Concluding Remarks

This paper examines South Korea's universal transfer program aimed at alleviating a Covid-19-induced recession. Using survey responses and analyzing a pilot program in 2016, we find that the transfer program may be effective in boosting household consumption and supporting small establishments and their employees. Our findings also suggest two concerns associated with the transfer program. First, by excluding online and large businesses, the program may constrain consumer choice and reallocate resources from large or online businesses to small and offline stores, possibly harming consumer welfare and economic efficiency in the long run. Second, the transfer program requires further analysis of its impact on fiscal balance and sustainability. In South Korea, the Covid-19 universal transfer program cost the central government US\$ 11 billion (0.7% of the 2019 GDP), with a quarter of the cost being financed by government debt. As the program is unlikely to generate additional tax revenues, further scrutiny is needed to examine its merit relative to existing policy instruments as well as its impact on fiscal sustainability.

¹¹ In 2016, 43% of employed workers were exempted from labor income taxes.
<https://www.edaily.co.kr/news/read?newsId=02082806619139056&mediaCodeNo=257>

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Table 1. Covid-19 Consumption Voucher Scheme

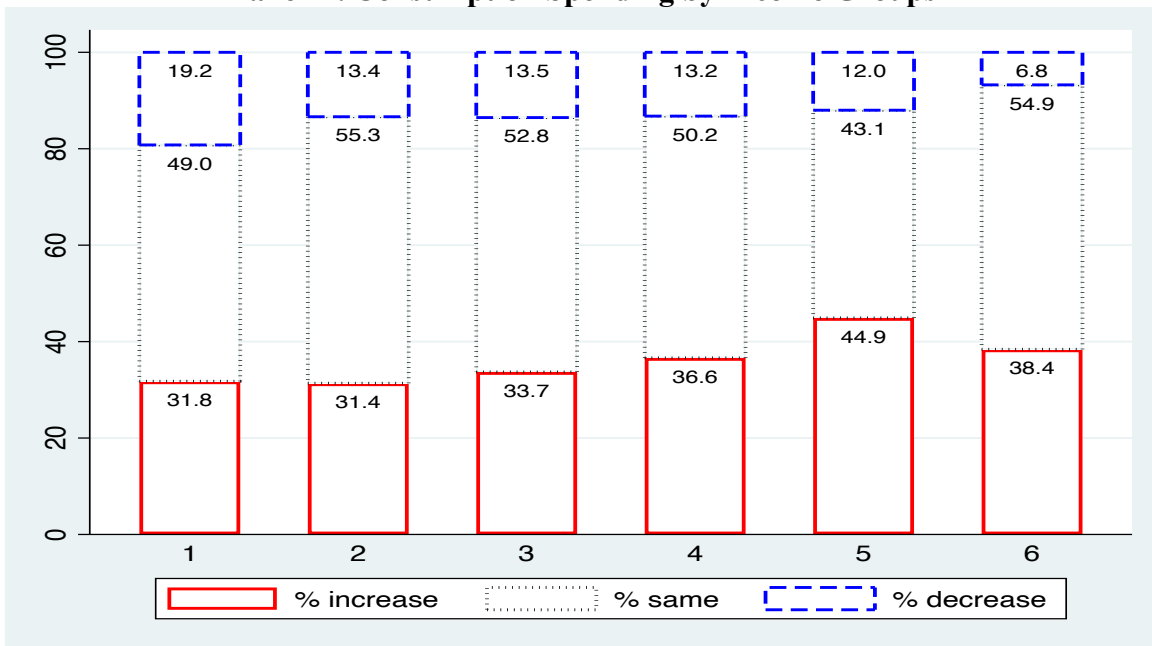
A. Central government: 1 out of 1
 The amount of the transfer: 400,000 won for one-person households, 600,000 won for two-person households, 800,000 won for three-person households, and 1,000,000 won for households of four or more.

B. Regional governments: 2 out of 17
 B.1 Metropolitan governments: Gwangju(50)
 B.2 Provincial government: Gyeonggi(100)

C. Municipal governments: 47 out of 226
 C.1 Busan: Gijang(100), Busanjin(50), Dong(50), Haeundae(50), Nam(50), Sasang(50), Seo(50), Suyeong(50)
 C.2 Ulsan: Ulju(100)
 C.3 Gyeonggi: Pocheon(400), Ansong (250), Hwaseong(200), Yeoncheon(200), Dongducheon (150), Icheon(150), Yangpyeong(120), Suwon(100), Seongnam(100), Pyeongtaek(100), Ansan(100), Gwacheon(100), Osan(100), Siheung(100), Yongin(100), Paju(100), Yangju(100), Yeosu(100), Gapyung(100), Guri(90), Uijeongbu(50), Anyang(50), Pucheon(50), Gwangmyeong(50), Goyang(50), Gunpo(50), Uiwang(50), Hanam(50), Gimpo(50), Gwangju(50)
 C.4 Gangwon: Hongcheon(300), Inje(200), Jeongseon(200), Yanggu(100), Cheorwon(100)
 C.5 Jeonbuk: Gunsan(100), Iksan(100)
 C.6 Jeonnam: Gwangyang(200)

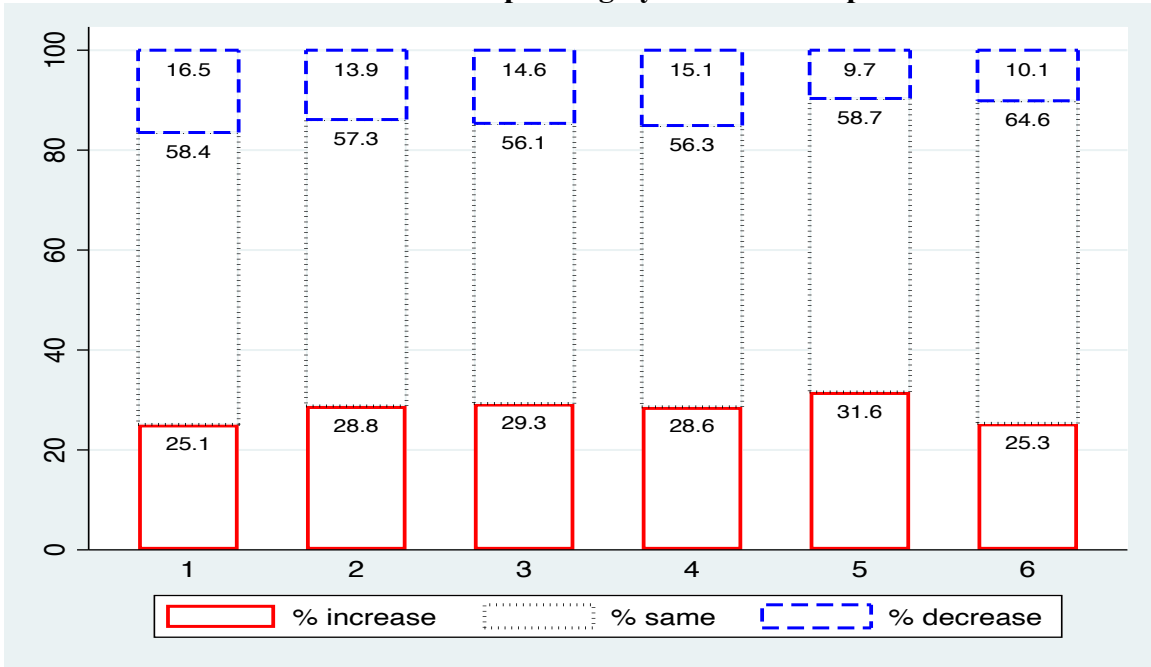
Note: Numeric values in parentheses are the amount of consumption vouchers per person (unit of KRW1,000, or US\$0.83). This table only includes the consumption voucher transfers without means testing. Thus, the subsidies to households in need are absent from this table.

Figure 1. Household Finance and the Covid-19 Consumption Vouchers
Panel A. Consumption Spending by Income Groups

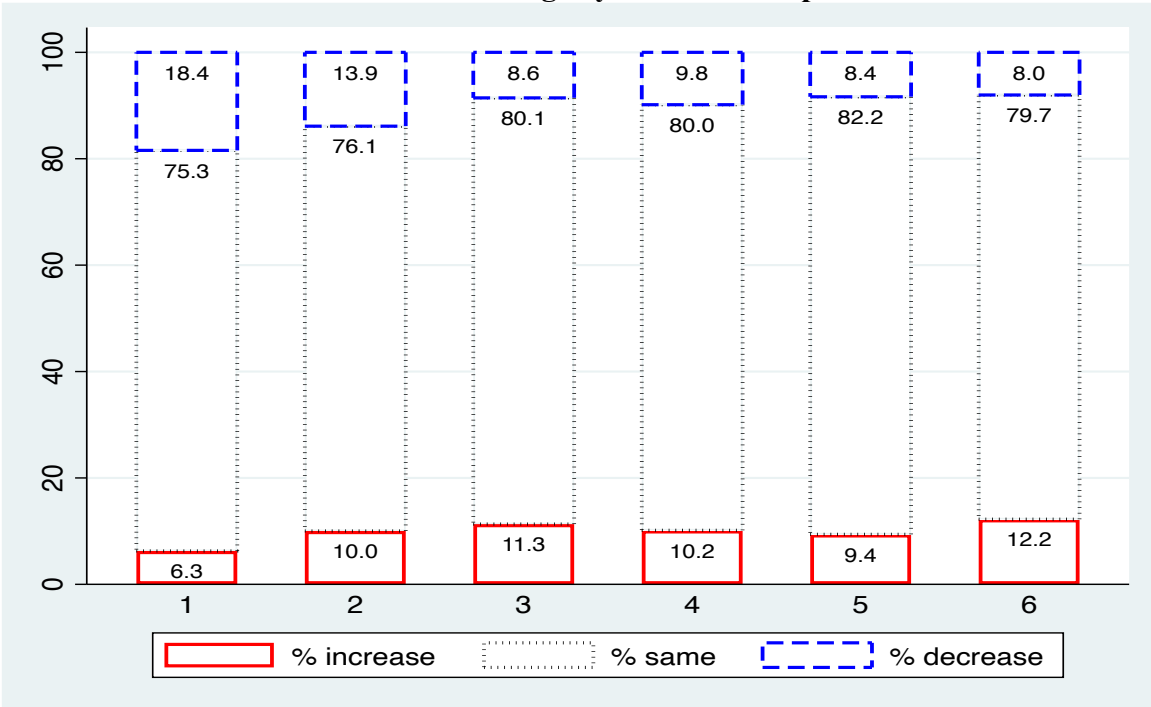


Note: We divide households into 6 groups based on their current monthly income: up to 199 million won (US\$ 1,654, Group 1), 200 to 299 million won (Group 2), 300 to 399 million won (Group 3), 400 to 499 million won (Group 4), 500 to 699 million won (Group 5), and equal to or more than 700 million won (Group 6). “%Increase”, refers to the share of households that increased their corresponding outcome after the Covid-19 pandemic, relative to normal times. “%Same,” and “%Decrease” are defined likewise

Figure 1. Household Finance and the Covid-19 Consumption Vouchers
Panel B. Total Spending by Income Groups



Panel C. Savings by Income Group



Note: We divide households into 6 groups based on their current monthly income: up to 199 million won (US\$ 1,654, Group 1), 200 to 299 million won (Group 2), 300 to 399 million won (Group 3), 400 to 499 million won (Group 4), 500 to 699 million won (Group 5), and equal to or more than 700 million won (Group 6). “%Increase,” refers to the share of households that increased their corresponding outcome after the Covid-19 pandemic, relative to normal times. “%Same,” and “%Decrease” are defined likewise

Table 2. Effect of Consumption Vouchers on Small Businesses

Outcomes	<u>Falsification</u>		<u>Policy Effect: 2015-2016</u>				<u>Policy Effect: 2015-2017</u>			
	I(treat,post) (1)	I(treat,post) (2)	Mean Y (3)	No.obs (4)	r-sq (5)	I(treat,post) (6)	Mean Y (7)	No.obs (8)	r-sq (9)	
A. In no. workers										
- all	0.001 (0.004)	0.008 (0.005)	3.662	480	0.999	0.017** (0.007)	3.670	720	0.999	
- up to 5 workers	0.008 (0.006)	0.028*** (0.006)	2.093	480	0.999	0.029*** (0.008)	2.112	720	0.999	
- groceries	0.011 (0.080)	0.037 (0.084)	-2.651	480	0.986	0.022 (0.075)	-2.584	720	0.962	
- restaurants	0.001 (0.012)	-0.051** (0.022)	0.698	480	0.995	-0.032 (0.022)	0.743	720	0.976	
B. In sales										
-	-	0.059 (0.051)	10.520	40	0.986	0.050 (0.029)	10.537	60	0.985	

Note: The unit of observation is district by month and year. In Panel A, we take the natural logarithm of the number of workers (unit of 1,000 persons) and use it as a dependent variable. In Panel B, we take the natural logarithm of the total amount of sales (unit of 1 million Korean won). For this reason, the mean dependent variables reported in columns (3) and (7) can be negative. We include district-, and month by year- fixed effects. Standard errors are clustered at the municipal level, reported in parentheses. * Significant at the 10% level; ** Significant at the 5% level; *** Significant at the 1% level.