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Building D, 370 Sicheong-daero, Sejong City 30147 KOREA **Korea Institute for Health & Social Affairs**

Income Distribution and the Effect of Public Transfers, Before and After COVID-19¹⁾

Wonjin Lee

Research Fellow, KIHASA

To better respond in the future to such large-scale economic crises as the one caused by the COVID-19 pandemic, strategies should be developed based on a thorough assessment of the pandemic's effects on income and poverty and a precise evaluation of the extent to which disaster relief payments and the National Basic Living Security Scheme mitigated these effects. The pandemic in its early stage had negative effects on market income levels and the poverty rate; however, by 2021, these effects had diminished. COVID-19's impact on market income did not lead to a disposable income shock, thanks to public transfers. Our analysis suggests that to respond effectively and efficiently to future economic crises, the policy focus should shift from the traditional, targeted income protection approaches—such as those concentrating support on older persons and those in poverty—to a universal application of social insurance, specifically a major expansion of employment insurance coverage.

Income distribution before and after the COVID-19 pandemic

This study uses the Household Finances and Living Conditions Survey (HFLCS) to explore yearly changes in income distribution over several years before and after the COVID-19 pandemic. Several

1) This brief is a reworking of part of *Changes in the Labor Market and Income Distribution during the COVID-19 Crisis*, a 2023 KIHASA report authored by Wonjin Lee, Sunyu Ham, and Jumi Lee.

studies²⁾ report that, following the outbreak of the pandemic, household income levels declined, the poverty rate increased, and income inequalities grew. These impacts were particularly salient among low-income groups, self-employed workers, and women with children. Although the income declines and worsening income distribution were significant in the early phases of the pandemic, these effects gradually diminished over time.

Previous studies of COVID-19's impact on income and poverty relied on the Household Income and Expenditure Survey (HIES), which provides monthly and quarterly data useful for quick assessments of the pandemic's early impacts on household income. However, measuring longer-term changes in COVID-19's effect on income distribution requires the annual data collected through the HFLCS. There is a significant need to assess the effects of disaster relief payments and income protection programs on COVID-19's impacts on household income and poverty. Based on these assessments, strategies need to be developed to better respond to future large-scale economic crises. The HFLCS is essential for these efforts, as it provides data on the receipt of public transfers such as National Basic Living Security benefits, in-work and childcare subsidies, and disaster relief payments.

The data used in this study are from the HFLCS, covering six consecutive income years up to 2021. The unit of analysis is the individual, with income equivalized by dividing the total household income by the square root of the number of household members.

To precisely estimate the impact of COVID-19 on household income, it is essential to consider the income trends that preceded the pandemic. For example, a 1-percentage-point increase in the poverty rate in 2020 compared to 2019 can hardly be attributed to the COVID-19 pandemic if the poverty rate had been rising by 1 percentage point each year for several years leading up to the pandemic. Data from different time points were integrated for regression analysis as presented in Equation (1) below, where $D_{T=p}$ is a dummy variable that takes the value 1 if $p = 2020$ or $p = 2021$, and 0 otherwise. TRD denotes a linear trend³⁾, and X refers to individual-specific control variables. β and γ each represent changes in outcome variables for the post-COVID-19 years of 2020 and 2021, respectively, estimated with pre-COVID-19 linear trends and individual-specific characteristics controlled for.

$$Y = \alpha + \beta \times D_{T=20} + \gamma \times D_{T=21} + \delta \times TRD + \zeta \times X + \epsilon \quad (1)$$

2) Nam, J.H. and Lee, R.H. (2020). (2020). Is the COVID-19's Impact Equal to All in South Korea? – Focusing on the Effects on Income and Poverty by Employment Status. *Korean Journal of Social Welfare*. 72(4), 215–241; Song, S.Y., The Impact of COVID-19 on Household Income Inequalities. Issue Note 2021–9. Bank of Korea; Yeo, E. et al. (2021). A Study on the Socioeconomic Impact of COVID-19 and the Effect Evaluation of Emergency Disaster Relief Funds. National Research Council for Economics, Humanities and Social Sciences; Lee, S.H. and Hong, M.K. The Effects of COVID-19 and Emergency Disaster Relief Funds on Household Income and Expenditure in Korea. *Korea Social Policy Review* 28(3), pp17–44; Baek, M.H. (2022). COVID-19 Pandemic and Economic Inequality: Focusing on Household Incomes and Wages. *The Journal of Labor Studies* 45, pp 5–47.

3) The linear trend is a continuous variable obtained by subtracting 2016 from each year.

[Table 1] Outcome variables: definitions

		Definition	Comments
Household income		<ul style="list-style-type: none"> • Equivalentized income—the household’s total income divided by the square root of the number of household members (absolute value/log value) 	<ul style="list-style-type: none"> • Annual, in KRW10,000 • CPI-adjusted, CPI-adjusted to 2021
Household income poverty		<ul style="list-style-type: none"> • Equivalentized income below the poverty line = 1; above the poverty line = 0 	<ul style="list-style-type: none"> • Poverty line⁴⁾: 50% of the median equivalentized disposable income for each year
Household income poverty gap		<ul style="list-style-type: none"> • Poor (poverty line – equivalentized household income) ÷ poverty line • Non-poor: 0 	
Effects of public income transfers	Income effect	<ul style="list-style-type: none"> • (equivalized market income + public transfer income) log – (equivalized market income) log 	<ul style="list-style-type: none"> • Public transfers: in-work and childcare subsidies; Basic Living Security benefits; disaster relief benefits; net public transfers
	Poverty effect	<ul style="list-style-type: none"> • (equivalued market income + public transfer income) poverty – (equivalized market income) poverty 	
	Poverty-gap effect	<ul style="list-style-type: none"> • (equivalized market income + public transfer income) poverty gap – (equivalized market income) poverty gap 	

Note: The effects of public transfers are defined in terms of total household market income and public transfer income; net public transfer income refers to the value calculated by subtracting tax and social insurance contributions from total public transfer income.

Post-COVID-19 changes in income distribution and the distributional effect of public transfers

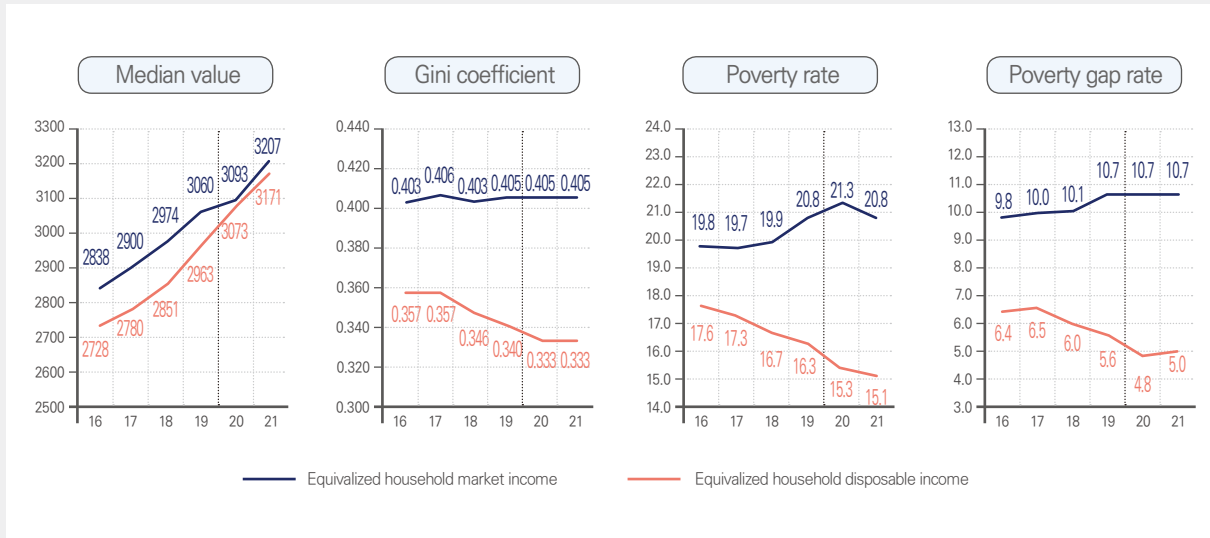
Our real-sample analysis indicates that the COVID-19 pandemic led to declines in market income in 2020. As illustrated in Figure 1, the trend of increasing median market income paused during that year. The observed decline in market income can be attributed to the pandemic under the assumption that had it not been for COVID-19, the upward trend of the median market income that marked the years 2016 through 2019 would have continued into 2020 and beyond.

In the trajectory of disposable income, which accounts for public transfers, no such change as observed in the market income trajectory has occurred in 2020. This suggests that the income impact of COVID-19 was significantly mitigated by public transfers, including disaster relief payments.

The findings suggest no significant post-COVID-19 changes in the Gini coefficient, the poverty rate, and the poverty gap rate. The market-income poverty rate increased to 21.3 percent in 2020 from 20.8 percent the previous year. However, given the significant increase in the market-income poverty rate in 2019, it is difficult to determine whether the 2020 change is due to COVID-19 or reflects ongoing long-term trends related to population and household structure changes.

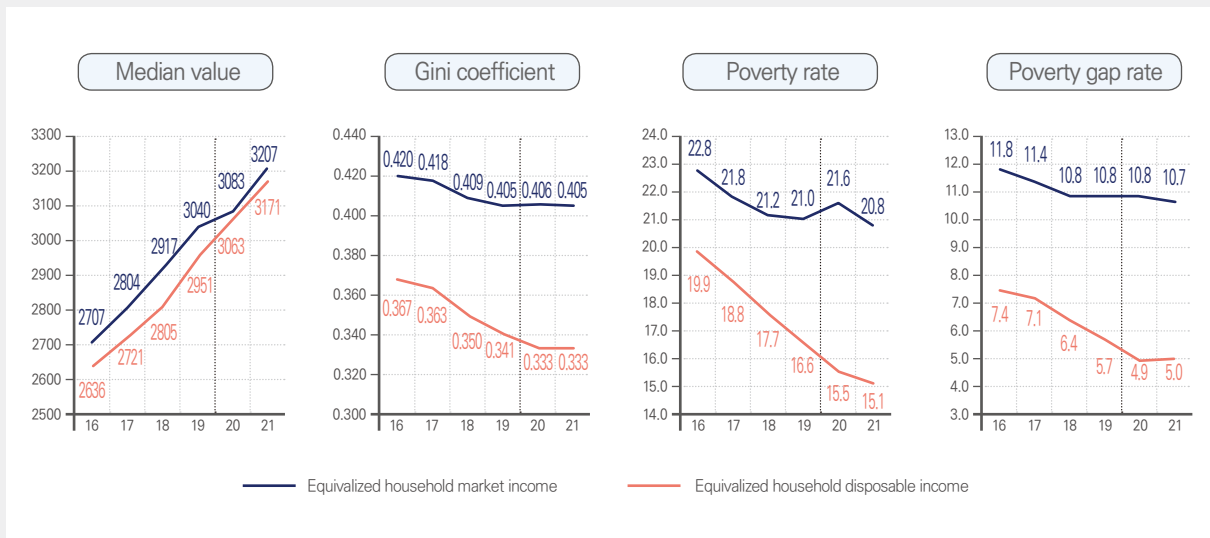
4) The poverty line was KRW 13.64 million/year in 2016, KRW 13.90 million/year in 2017, KRW 14.25 million/year in 2018, KRW 14.81 million/year in 2019, KRW 15.37 million/year in 2020, and KRW 15.86 million/year in 2021 (in 2021 real value). Statistics Korea. Household Finances and Living Conditions Survey data: While it is possible that disaster relief payments, administered on a grand scale, have somewhat distorted the median income and poverty line in and after 2020, the data show little change in the poverty line trend before and after COVID-19.

[Figure 1] Income distribution across the population, trends based on real samples
(in ten thousand KRW; points; %)



Source: Household Finances and Living Conditions Survey raw data. Statistics Korea. MacroData Integrated Service. Remote Access Service. DOI: 10.23333/R.930001.001

[Figure 2] Income distribution across the population, trends based on reweighted samples
(in ten thousand KRW; points; %)



Note: The weights are adjusted so that the distributions of sex, age, and household size among the general population for each year match those for 2021.

Source: Household Finances and Living Conditions Survey raw data. Statistics Korea. MacroData Integrated Service. Remote Access Service. DOI: 10.23333/R.930001.001

Our analysis of the income distribution of re-weighted samples, controlled for sex, age, and changes in family size, revealed that the COVID-19 pandemic led to market income declines and a worsening of the market income distribution (see Figure 2). To control for the effect of demographic characteristics such as aging and declining household size, we adjusted the weights so that the distributions of sex, age, and household size among the general population for each year matched those for 2021. With sex, age, and changes in family size controlled for, the market-income Gini coefficient and poverty rate stopped declining in 2020, indicating that COVID-19 had a deteriorating effect on market-income distribution. COVID-19's impact on income is regarded as having dissipated in 2021. Meanwhile, no evidence was found suggesting that the COVID-19 pandemic worsened the distribution of disposable income.

Our analysis of the distributional effect of public transfers suggests, as in Figure 3, that disaster relief payments have significantly cushioned the pandemic's impact on poverty and inequality. We estimated the distributional effect of public transfers in terms of changes after COVID-19 in the Gini coefficient, poverty rate, and poverty gap with respect to market income and various public transfers combined. For instance, a comparison of market income alone and market income plus Basic Living Security benefits found that the public assistance program reduced the poverty gap rate by 1.1 percentage points in 2021. In-work and childcare subsidies contributed less to mitigating the impact of COVID-19, despite its distributional effect greatly enhanced in 2019 due to the easing of the eligibility criteria regarding age, income, and assets. The distributional effect of the National Basic Living Security Scheme (NBLSS) was found to have increased after the COVID-19 pandemic, due to policy changes made largely independently of the pandemic's impact. The NBLSS is a system where individuals become eligible for benefits if their income falls below a certain threshold and cease to be eligible if their income rises above the limit, thereby functioning as an automatic stabilizer that cushions the impact of economic fluctuations. As illustrated in Figure 3, the distributional effect of the NBLSS grew moderately from before the COVID-19 outbreak onward, likely as a result of the removal of the support obligor rule from the housing allowance in 2018, the expansion of earned income tax credits for workers and businesses in 2020, and the easing of the support obligor rule on livelihood benefits in 2021.

**[Figure 3] Public transfers and their income distributional effect
(Gini coefficient in points; poverty rate and poverty-gap rate in % points)**



Note: Figures are based on equivalized total household public transfer income; calculated by subtracting the distributional measures of market income from the distributional measures of market income and public transfer income combined.

Source: Household Finances and Living Conditions Survey raw data. Statistics Korea. MacroData Integrated Service. Remote Access Service. DOI: 10.23333/R.930001.001

Disaster relief payments significantly mitigated the impact of COVID-19 on poverty and inequality. Paid out in two rounds, universally in May 2020 to all people in Korea and in September the following year to 88 percent of the population, these benefits, compared to the selective NBLSS, had a larger effect on reducing the Gini coefficient and poverty rates, though they had a lesser effect on reducing the poverty gap rate.

Table 2 presents the pandemic’s impacts on income and poverty, as estimated through regression analysis controlling for linear trends, sex, age, educational level, and family size. There was a statistically significant reduction of KRW570,000—a 0.024 log point decline—in market income in 2020 compared to 2019. No statistically significant reduction was observed in market income for 2021. Despite the pandemic’s impact on market income in 2020, there was an overall increase in disposable income in both 2020 and 2021, due to disaster relief payments.

[Table 2] Changes in income, poverty, and the effect of public transfers: before and after COVID-19 (poverty and poverty gap in points; income in ten thousand KRW per year—in 2021 real income; income effect in log ten-thousand KRW per year—in 2021 real income)

	2020		2021	
	Equation (1) β		Equation (1) γ	
Equivalized household market income	-56.693	(28.868) *	10.691	(58.142)
Log equivalized household market income	-0.024	(0.010) *	-0.012	(0.014)
Equivalized household disposable income	38.070	(23.040) +	83.430	(46.904) +
Log equivalized household disposable income	0.017	(0.008) *	0.010	(0.011)
Market-income poverty	0.010	(0.004) **	0.005	(0.005)
Market-income poverty gap	0.002	(0.002)	0.002	(0.003)
Disposable-income poverty	-0.002	(0.004)	0.002	(0.005)
Disposable-income poverty gap	-0.004	(0.002) *	0.001	(0.003)
In-work and childcare subsidies: income effect	-0.001	(0.001)	-0.003	(0.002) +
In-work and childcare subsidies: poverty effect	0.000	(0.001)	0.003	(0.001) *
In-work and childcare subsidies: poverty-gap effect	0.001	(0.000) *	0.002	(0.000) ***
Basic Living Security: income effect	0.006	(0.004)	0.010	(0.006)
Basic Living Security: poverty effect	0.000	(0.001)	0.000	(0.001)
Basic Living Security: poverty-gap effect	0.000	(0.000)	-0.001	(0.001)
Disaster relief payments: income effect	0.102	(0.003) ***	0.090	(0.003) ***
Disaster relief payments: poverty effect	-0.014	(0.001) ***	-0.014	(0.001) ***
Disaster relief payments: poverty-gap effect	-0.010	(0.000) ***	-0.008	(0.000) ***
Net public transfers: income effect	0.041	(0.007) ***	0.022	(0.010) *
Net public transfers: poverty effect	-0.012	(0.003) ***	-0.003	(0.004)
Net public transfers: poverty-gap effect	-0.006	(0.001) ***	0.000	(0.003)

Note: The values are calculated by Equation (1); The figures in parentheses are cluster standard errors accounting for the autocorrelation within the same household identifier; linear trends, sex, age, educational level, and household size are controlled for; + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Source: Household Finances and Living Conditions Survey raw data. Statistics Korea. MocoData Integrated Service. Remote Access Service. DOI: 10.23333/R.930001.001

In 2020, market-income poverty rose by 1 percentage point. However, there was no increase in the poverty rate or poverty gap in terms of disposable income. In 2021, there were no statistically significant changes in the disposable-income poverty rate or poverty gap. The rise in market-income poverty was largely offset by disaster relief payments, which led to an increase in income by 0.102 log points in 2020 and 0.090 log points in 2021. These payments reduced poverty by 1.4 percentage points in both 2020 and 2021 and narrowed the poverty gap by 1.0 percentage point in 2020 and 0.8 percentage points in 2021.



A supplementary analysis of Korea Welfare Panel data

Table 3 summarizes findings from our supplementary analysis of the distributional effect of public transfers, using the Korea Welfare Panel, which, compared to the HFLCS, offers more detailed data on public transfers. We constructed balanced panel samples of individuals aged 18 and older, with one covering 2019 through 2020 and the other covering 2019 through 2021. For each sample, we analyzed changes in income-related outcomes over the corresponding time periods.⁵⁾ The change in the distributional effect of public transfers between time points t and $t+1$ is measured as in Equation (2):

$$\Delta Y_{T1 \rightarrow T2} = \alpha + \beta \times D_{T1=19} + \gamma \times TRD + \delta \times X_{T1} + \epsilon \quad (2),$$

where Y represents the outcome variables shown in Table 1, and $D_{T1=19}$ is a dummy variable that takes the value 1 if $T1 = 2019$, and 0 for any year preceding 2018. The unit of analysis is ‘person-year’, with the two time points, t and $t+1$, integrated. Changes in outcome variables are measured by subtracting the value at $T1$ from the value at $T2$, where $T1$ is the initial time points and $T2$ is the final time point. TRD represents a linear trend⁶⁾, and X_{T1} is a control variable with its value determined at $T1$. Thus, changes in outcome variables before and after COVID-19 are estimated using regression analysis based on Equation (2), with linear trends and individual characteristics controlled for.

Employment insurance benefits were found to have somewhat cushioned the poverty impact of COVID-19. For instance, the poverty-gap reduction effect of these benefits was estimated to have increased by 0.3 percentage points between 2019 and 2020 and by 0.2 percentage points between 2019 and 2021.

In-work and childcare subsidies had a 0.1 percentage point decrease in their poverty-gap reduction effect in the period from 2019 through 2021 compared to the periods before COVID-19. As these benefits are intended only for low-income groups participating in economic activities, they had no effect on mitigating the economic impact of employment loss due to COVID-19.

The poverty-gap reduction effect of the NBLSS increased by 0.5 percentage points from 2019 to 2021 compared to before COVID-19. This increase is likely due to several institutional changes, including the expansion of earned income tax credits for workers and small businesses in 2020, the easing of the support obligor rule on livelihood benefits in 2021, and the increase in the ceiling for housing benefits eligibility in 2020.

The change observed in the poverty-gap reduction effect of the emergency welfare support before and after COVID-19 turned out to be minimal. Despite a moderate expansion in coverage due to eased eligibility criteria post-COVID-19, the emergency welfare program remained limited in scope and low in benefit level. In contrast, disaster relief payments had a significant effect on increasing post-COVID-19 income levels and reducing both poverty and the poverty gap. This effect persisted into 2021.

5) The analysis of the change between 2019 and 2020 involved comparing it with changes in periods between 2015 and 2016, 2016 and 2017, 2017 and 2018, and 2018 and 2019. The period between 2019 and 2021 was compared with periods between 2015 and 2017, 2016 and 2018, and 2017 and 2019.

6) A linear trend is a continuous variable where the value 0 is assigned to the person-year at time $T1=2015$, with each subsequent year gaining 1.

[Table 3] Changes in the effects of public transfers, before and after COVID-19 (poverty and poverty gap in points; log values in ten thousand KRW per year, based on 2021 real income)

		19 → 20	19 → 21			19 → 20	19 → 21
		Equation (2) β	Equation (2) β			Equation (2) β	Equation (2) β
Employment insurance benefits	Income effect	0.010 **	0.005	Emergency welfare support	Income effect	0.001	-0.001
	Poverty effect	-0.004	-0.004		Poverty effect	0.000	0.000
	Poverty-gap effect	-0.003 **	-0.002 +		Poverty-gap effect	0.000 *	0.000
In-work and childcare subsidies	Income effect	-0.003 **	-0.006 **	Disaster relief payments	Income effect	0.092 ***	0.071 ***
	Poverty effect	0.001	-0.001		Poverty effect	-0.010 ***	-0.010 ***
	Poverty-gap effect	0.000	0.001 **		Poverty-gap effect	-0.010 ***	-0.008 ***
Basic Living Security benefits	Income effect	0.012 +	0.019	Net public transfers	Income effect	0.039 *	-0.019
	Poverty effect	-0.003	0.001		Poverty effect	-0.021 **	-0.023
	Poverty-gap effect	-0.001	-0.005 **		Poverty-gap effect	-0.004	0.009

Note: The values are calculated by Equation (2); cluster standard errors are used to account for the autocorrelation within the same household identifier; control variables are linear trends, sex, age, educational level, and household size; net public transfers refer to the value calculated by subtracting tax and social insurance contributions from total public transfers; + $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Source: Korea Welfare Panel Survey raw data. KIHASA and the Institute of Social Welfare, Seoul National University. <https://www.kowepe.re.kr>

Concluding remarks

COVID-19 had an adverse impact on market income and poverty. Thanks to public transfers, the impact of COVID-19 on market income did not cause any significant shock to disposable income. While employment insurance helped offset income losses resulting from COVID-19 economic disruptions, the NBLSS supported the subsistence of those living on low incomes, regardless of COVID-19 shocks. Disaster relief payments, made universally to everyone in the country, have supported those whose income declined following the pandemic and existing low-income groups alike.

The overall implication of our study on the effect of public transfers is that responding effectively and efficiently to a large-scale economic crisis requires shifting from traditional targeted income security strategies that focus on the elderly and the poor. A public assistance system like the NBLSS can serve as an automatic stabilization mechanism in coping with the fluctuations of market-income poverty. However, with its benefit eligibility restricted largely to the poorest segment of the population, it is hardly considered a system capable of broadly addressing a large-scale economic crisis. Nor is the NBLSS an effective means of supporting secondary income earners who, while not low in economic status as household members, might have slipped down the income scale as individuals.

Disaster relief payments have significantly contributed to mitigating the impact of COVID-19 on income and poverty. However, it is also important to ensure that these payments are kept clear of financial leakages, which can occur with temporary universal measures intended to address urgent situations. To cope effectively and efficiently with an economic crisis like the one that came with the pandemic, employment insurance needs renovation. This should involve extending income-based employment insurance to atypical and informal workers, gig workers, and the self-employed. Also needed are a partial unemployment benefit scheme that responds to reduced work hours and underemployment, quality improvement for government-subsidized jobs, enhancement of the care safety net to ensure caregiving does not stop in a crisis, and a universal sick pay scheme.