

Leveraging Non-traditional Datasets for Assessing Socioeconomic Impact of COVID-19 across Philippine Households

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The COVID-19 pandemic has affected the Philippine economy in unprecedented ways. The country suffered a 9.6 percent contraction of its GDP in 2020, the worst on record in the post-World War II period. With the second highest cases in Southeast Asia, the country continues to struggle to contain the disease and remains under various degrees of community quarantine. This policy brief examines the socioeconomic impact of the pandemic across Philippine households using non-traditional datasets, particularly market research data showing fast-moving consumer goods (FMCG) spending and mobility data. The paper observes differences in pandemic restrictions and recovery across different geographical areas in the country and in the pace of recovery across households belonging to different socioeconomic groups. The analysis shows that there is a positive and significant relationship between the level of mobility and the pace of economic recovery. Moreover, there is an indicative positive effect of the distribution of cash aid on the spending patterns of households. The findings suggest that non-traditional datasets can be useful complements to official data in bringing in a more granular and timely analysis to inform socioeconomic recovery efforts in the Philippines. To successfully harness the full potential of such datasets a national framework needs to be put in place to assess the quality of the datasets to inform crisis responses, recovery, and long-term development.

1. Introduction

The economy of the Philippines is one of the most dynamic in the East Asia Pacific region.² It was able to sustain an average annual growth of 6.4 percent between 2010-2019, up from an annual average of 4.6 percent between 2001-2009. Around 85.7 percent of the economy is driven by consumption spending³ and the major sectors that had the largest contributions to the country's gross domestic product (GDP) in 2018 were services, trade, finance and construction.⁴ The country is also considered by the World Bank to be on the path to becoming an upper middle-income country from being a lower middle-income country in the near term.⁵

However, the COVID-19 pandemic has affected the Philippine economy in unprecedented ways. On January 30, 2020, the first case of COVID-19 was reported in the Philippines. By March 8, 2020, the country was placed under a "State of Public Health Emergency." Lockdown measures were imposed in the capital city of Metro Manila starting on March 15, 2020 and eventually expanded to cover all of Luzon (the largest and most populous island in the Philippines, and where Metro Manila is located). All parts of the country continue to be under some level of community quarantine as of June 2021.⁶ As of June 7, 2021, a total of 1,276,004 cases have been reported, with 58,854 active cases and 21,969 deaths due to COVID-19.⁷

As a consequence, the country suffered a 9.6 percent contraction of its GDP in 2020, the worst on record in the post-World War II period. In the first quarter of 2021, the economy registered its fifth straight quarter of contraction, at -4.2 percent growth rate, making it the longest recession in recent history. This led to employment rates reaching a record low of 82.4 percent in April 2020. These rates have subsequently improved to about 92.9 percent in March 2021.⁸ The main contributors to GDP decline were construction, services like entertainment and recreation, and real estate.^{9 10 11}

¹² Furthermore, demand-side factors contributed to economic contraction, as represented, for instance, by a major decline in consumption spending¹³ during the COVID-19 crisis — especially during strict lockdowns, when many businesses had to stop operations and people had to stay home.

While policymakers are actively monitoring the impact of COVID-19 and the recovery of the economy in response to various measures taken by the government, absence of high frequency data has limited the pace of public action. To help inform the recovery efforts of the Philippine government

as the country transitions into a "new normal," we have explored the use of non-traditional datasets to supplement official statistics. Non-traditional datasets enable analysis at a more granular level and can be updated more frequently.¹⁴ Furthermore, we have found that these non-traditional indicators enable us to go beyond the macro level and examine heterogeneities across geographical areas and socioeconomic groups as well as track changes over weeks and months rather than over quarters. Lastly, while these datasets are widely used in the private sector, they are relatively underutilized in the public and development sectors; it is, therefore, an opportune moment to explore their use.

In this policy brief, we use non-traditional datasets to generate some insights on the impact of COVID-19 and the pace of the recovery. Specifically, we aim to address the following research questions:

- What is the impact of COVID-19 and what is the state of recovery from the COVID-19 crisis at the national level?
- Can we observe differences in recovery across different geographical areas in the country?
- Can we identify a relationship between the level of mobility and the pace of economic recovery?
- Can we observe differences in the pace of recovery across households belonging to different socioeconomic groups?
- Can we identify an effect of the distribution of cash aid on the spending patterns of households?

This paper proceeds in five sections. Section 1 serves as the introduction. Section 2 gives a comprehensive view on the effect of COVID-19 on the Philippine economy and assesses the pace of recovery. Section 3 expounds on the varying degrees of mobility patterns and describes the recovery process across different geographic areas in the country, including how these factors are related. Section 4 discusses the varying effects of COVID-19 on consumer spending across different socioeconomic groups and relates these to the effectiveness of cash assistance given by the government. Lastly, Section 5 concludes the paper and proposes actionable recommendations.

2. Impact of COVID-19 and Recovery Trajectories

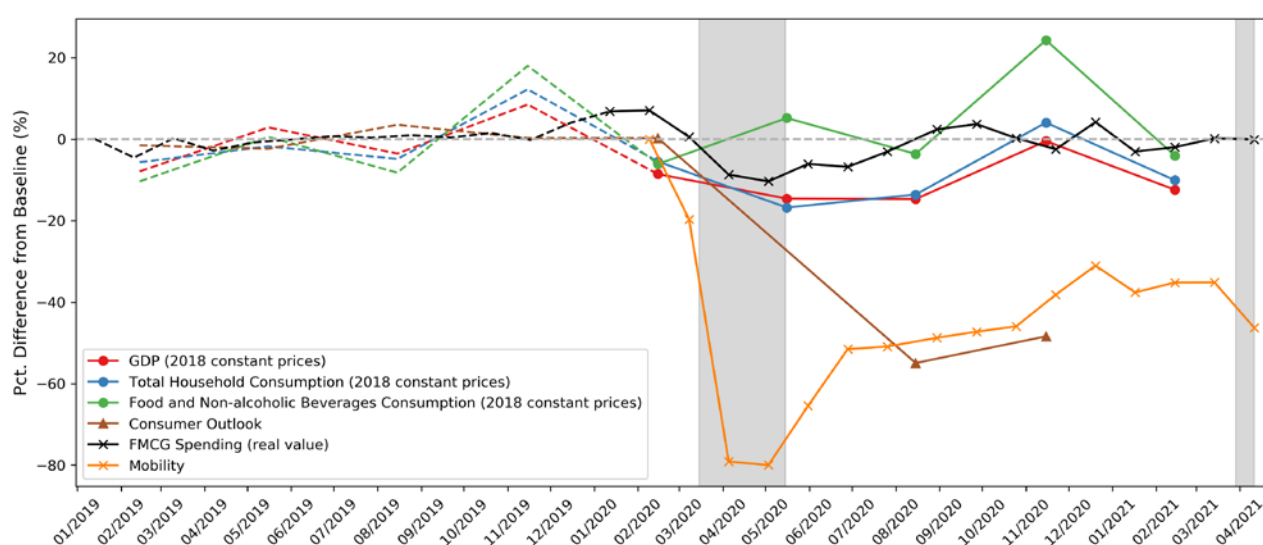
In this section, we will assess the impact of COVID-19 on the Philippine economy and assess the pace of recovery. By using non-traditional datasets to complement official statistics, we gain a more comprehensive view of the state of the Philippine economy.

Figure 1 shows the impact of the COVID-19 pandemic on the Philippine economy as tracked by official statistics like the quarterly national income accounts indicators, consumer outlook data¹⁵ (brown curve) collected by the Philippine's central bank, as well as monthly indicators from non-traditional datasets. The quarterly national income accounts indicators include: GDP, total household consumption, and food and non-alcoholic beverages consumption (red, blue, and green curves, respectively). The non-traditional datasets include: fast-moving consumer goods (FMCG)¹⁶ spending and mobility (black and yellow curves, respectively).¹⁷ The shaded-gray regions indicate the initial period of strict, large-scale lockdowns imposed by the government from March 15, 2020 to May 15, 2020, and from the end of March 2021 until mid-April 2021 in Metro Manila and its neighboring provinces due to the surge of COVID-19 cases in these areas.

To indicate the change of the indicators' values relative to their pre-COVID-19 crisis values, we calculated the percentage difference from a baseline equal to the average value over four quarters of 2019 (dashed portion of the curves). To account for inflation, prices were first converted to real values.¹⁸ The magnitude of negative values reached indicates the extent of impact of the crisis and a return to zero or positive values indicate a recovery to pre-crisis levels.

Comparing across these indicators in Figure 1, we find that the trend in GDP and total household consumption followed the same behavior throughout the post-pandemic period observed (see red and blue curves). This is not surprising as total household consumption is the dominant contributor to GDP by expenditure, contributing 73 percent of the total GDP for the period covered by this analysis. Both indicators showed significant declines relative to pre-pandemic levels — registering percentage differences of -14.7 percent and -13.6 percent in the third quarter of 2020, respectively. After a spike buoyed by holiday spending in the fourth quarter of 2020, both indicators have regressed to register percentage differences of -12.4 percent and -10.1 percent, respectively, in the first quarter of 2021 compared to their 2019 averages.

Figure 1: Impact of the COVID-19 Pandemic on the Philippine Economy: Quarterly Official Statistics vs. Monthly Indicators from Non-traditional Datasets (FMCG Spending and Mobility)



Source: Authors' Calculations based on data from Philippine Statistical Authority National Income Accounts, Bangko Sentral ng Pilipinas (Central Bank of the Philippines) Consumer Expectations Survey, Nielsen Homepanel Service, and Google Community Mobility Reports.

In contrast, the consumption of food and non-alcoholic beverages showed a slight increase during the strict lockdowns due to possible hoarding of food and beverages before it declined until August 2020. It then showed an even stronger holiday spike. This indicates that, as expected, households prioritized spending for essentials during this pandemic. The decline in total consumption can be attributed to significant drops in spending for transport and restaurants/hotels, which were most affected by pandemic-related restrictions and protocols. Meanwhile, consumer outlook data show that there had been a steep decline from February 2020 to August 2020, indicating low consumer confidence. This recovered slightly by November 2020.

Interestingly, we find that the trend in FMCG spending falls somewhere between these two trends.¹⁹ It registered a post-pandemic drop, bottoming out at a -10.3 percent decline relative to pre-pandemic levels in May 2020. It then showed a faster recovery relative to GDP and total household consumption, returning to pre-pandemic levels by August 2020. This makes sense, as spending on packaged and branded goods (biscuits/cookies, snacks, instant coffee, etc.) would be considered optional purchases when compared to staple food products (rice, vegetables, meat, fish, etc.), and households could adjust their consumption according to their spending capacity. At the same time, since this list mostly consists of food and beverage items (categorized as essential), it would not be as affected as the other pandemic-restricted categories of transport and restaurants/hotels, which contribute much more heavily toward the decline in total household consumption.

Finally, we observe that the mobility indicator followed the trend of FMCG spending since the beginning of the pandemic (orange and black curves). As expected, the largest decline occurred

during the large-scale lockdowns in April to May 2020, during which the percentage difference relative to pre-pandemic levels reached a staggering -80 percent. This was followed by a relatively quick recovery, which slowed down after July 2020. A holiday spike in December 2020 is observed here as well, as expected, but even at its peak, mobility was still well below pre-pandemic levels. The most recent data available, from March 2021, one year after the pandemic started, registered a percentage difference of -35 percent. This is a strong indication that economy-spurring activities related to retail and recreation are still significantly depressed due to a combination of government restrictions and lack of consumer confidence.

Altogether, these six indicators (in Figure 1) paint a multi-faceted picture of the impact of the COVID-19 pandemic on the Philippine economy. GDP shows a prolonged recession over the last five quarters (red curve) accompanied by a prolonged depression in mobility (orange curve), reflecting the inability of the country to contain the coronavirus. The decline in GDP is largely due to the decline in total household consumption (blue curve), reflecting depressed incomes amid the drop in employment. It was also evident that consumer outlook (brown curve) was at a very low level until the last quarter of 2020. Overall, households continued to spend on essential food items at similar or higher levels as they did prior to the pandemic (green curve) but had to cut down spending on other items, including branded and packaged goods (FMCGs). This is reflected in the decline in FMCG spending (black curve) in March and April 2020, as employment rates reached a record low. This was followed by a slow recovery, as employment rates also improved, with household spending on FMCGs starting in September 2020 at similar or higher levels as compared to before the pandemic.

3. Recovery Across Geographical Areas and Geographic Mobility

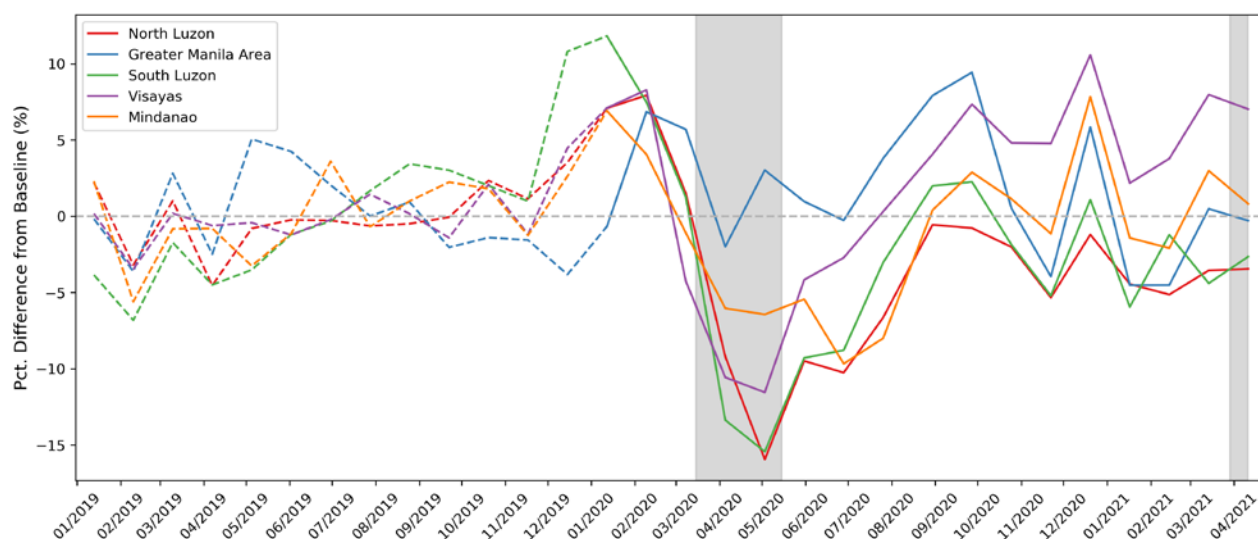
In a continuing effort to contain the spread of COVID-19 infections in the country, the government of the Philippines through its Inter-Agency Task Force on Emerging Infectious Diseases (IATF-EID) has imposed a series of community quarantines at the regional, provincial, and city levels. These quarantines involve stay-at-home orders, as well as travel and work restrictions at different levels of strictness. The level of community quarantine and set of imposed restrictions vary widely over time and geographical area. The relationship between mobility and expenditure in pandemic times has been studied in other countries.²⁰ Here, we study the variation over time and geographical area in FMCG spending data to examine the heterogeneity in the impact of the shock and pace of recovery across geographical areas as well as to estimate the elasticity of expenditure with respect to mobility.

Figures 2 and 3 show trends in FMCG spending of households and mobility for five (5) geographical areas of the Philippines (from North to South):

North Luzon, Greater Manila Area (GMA), South Luzon, Visayas, and Mindanao. The Greater Manila Area is the metropolitan area of the national capital, composed of Metro Manila and surrounding cities; together with North Luzon and South Luzon, they make up the island group of Luzon. Altogether, the three island groups of Luzon, Visayas, and Mindanao make up the Philippines. For 2021, households from each of these geographical areas are estimated to comprise 16.8 percent, 20.6 percent, 20.8 percent, 18.8 percent, and 23.0 percent of Philippine households, respectively.

For FMCG-spending data, we calculated percentage differences relative to a pre-pandemic baseline based on the averages of 2019 data which was adjusted for price (dashed portion of the curves; as in Figure 1). The baseline spending amounts per four-week period are: PhP 3,345; PhP 2,596; PhP 2,893; PhP 2,747; and PhP 1,964 for North Luzon, Greater Manila Area (GMA), South Luzon, Visayas, and Mindanao, respectively.²¹

Figure 2: Impact of the COVID-19 Pandemic on Household Spending by Geographical Area



Source: Authors' calculations based on data from Nielsen Homepanel Service.

We find that all five areas showed significant declines in spending during the initial period of lockdowns (indicated by the left shaded-gray region), when strict quarantine restrictions were imposed on the entire Luzon Island as well as selected areas in Visayas and Mindanao. However, there are stark differences in the degree of impact across geographical areas. North and South Luzon experienced the largest drop in spending, registering percentage differences

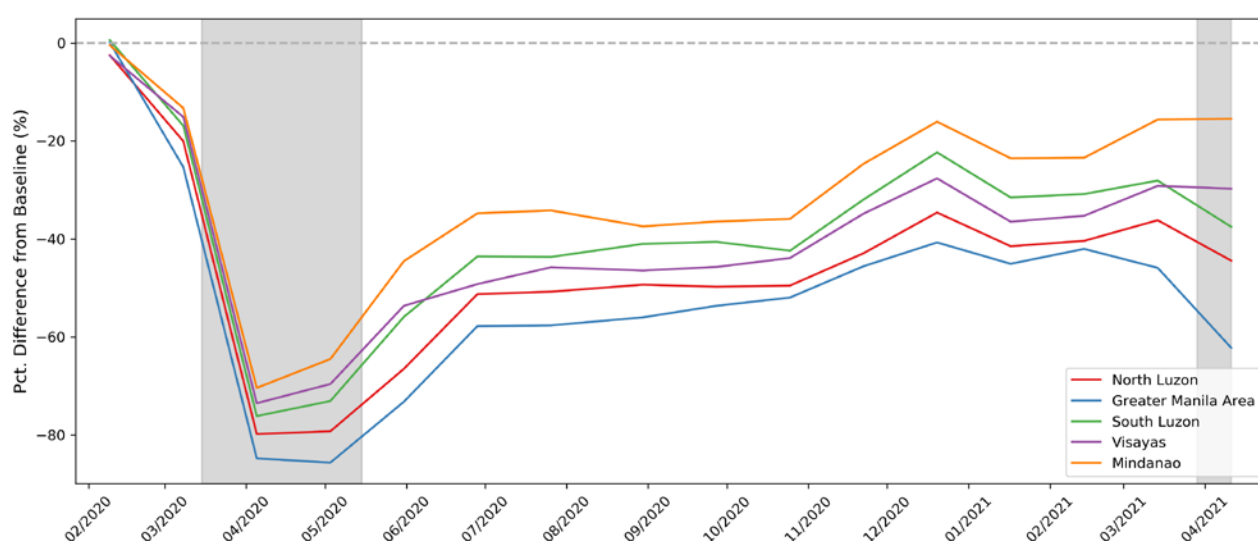
of -15.9 percent and -15.4 percent, respectively, at their lowest point in May 2020. Next in rank are Visayas and Mindanao, reaching lows of -11.5 percent and -6.4 percent, respectively, in the same month. The Greater Manila Area is a clear outlier in this group; although it experienced a drop in April, it quickly recovered and managed to stay above pre-pandemic levels throughout most of the period of study. This could partly be due to high level of

connectivity compared to other areas that may have allowed households to afford spending.

The pace of recovery also varied across geographical areas in general. Considering the rate at which the FMCG spending levels returned to baseline values after the initial depression, we find that North Luzon, South Luzon, and Mindanao took the longest to recover, with recovery not occurring until the latter part of July 2020. Visayas recovered relatively faster, reaching, and exceeding, its pre-pandemic baseline in June 2020. The Greater Manila Area recovered fastest, with a dip lasting

for only the month of April 2020. Despite observed volatilities, spending in Greater Metro Manila remained below pre-pandemic level for the first three months of 2021. However, in terms of the rate of increase in spending, we find that Visayas and Mindanao (purple and orange curves) have the highest percentage differences among all areas, since November 2020. This may be an early sign of higher levels of socioeconomic recovery in areas farther from the capital, where COVID-19 cases have been contained in a sustained way and pandemic restrictions have become more relaxed.

Figure 3: Impact of the COVID-19 Pandemic on Mobility by Geographical Area



Source: Authors' calculations based on data from Google Community Mobility Reports.

We now attempt to estimate the elasticity of expenditure — proxied by FMCG spending — with respect to mobility, using indicators obtained from Google Community Mobility Reports (Figure 3).²² Google tracks mobility using the location history of the Google accounts on individuals' mobile devices. We focused on the mobility trends for places of retail and recreation, which can be considered optional activities. The pre-pandemic baseline is taken to be the median value from the same day of the week (e.g., Sunday) over the five-week period from January 3 to February 6, 2020. For this analysis, we calculated the mean of the daily percentage differences over the same four-week periods for which FMCG-spending indicators are available.²³

We thus obtain a dataset with a total of 80 observations (for 5 geographical areas and 16 four-week periods) and two variables: (i) the percentage difference of FMCG spending from baseline for geographical area GA and period P ;

and (ii) the mean percentage difference of mobility from baseline for geographical area GA and period P . The regression model below controls for fixed effects of geographical area:

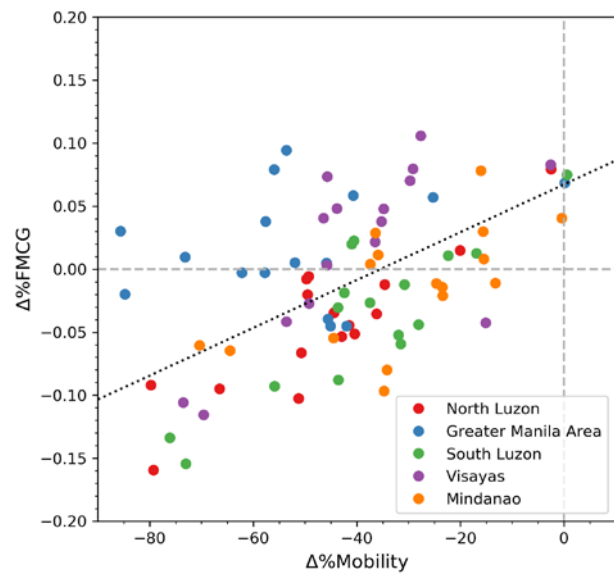
$$\Delta\%FMCG_{GA,P} = \beta \Delta\%Mobility_{GA,P} + \delta_{GA} + \varepsilon_{GA}$$

The control term is for permanent differences across geographical areas, as areas vary in their susceptibility to an economic shock. We did not control for the time variation as policies change frequently in different locations over this period. Though this might introduce an omitted-variable bias, the effect would be minor as the major event happening throughout the period is the quarantine, which is indirectly reflected in mobility. We find a coefficient of 0.0019 with high significance and a moderate relationship where around 43 percent of the variance in percentage change in FMCG spending can be explained by the percentage change in mobility ($R^2 = 0.43$), as shown in Figure 4.

This indicates that mobility may be significantly related to having low FMCG spending. Considering that consumer outlook was still very low in 2020 and restrictions had been relaxed after the initial lockdown period, the sustained low mobility might not be fully attributable to restrictions. It can also be an indication that consumer confidence had not fully returned to pre-pandemic levels and that its restoration is needed to spur the economy.

This analysis points to the potential of using mobility data as a predictor of consumption patterns. It also indicates how this data can be useful not only for assessing the likely impact of quarantine restrictions on expenditures but also for predicting potential spending losses induced by future crises that may also have an impact on mobility.

Figure 4: Relationship between Mobility and Household Spending (February 2020 to April 2021)



Source: Authors' calculations based on data from Nielsen Homepanel Service and Google Community Mobility Reports.

4. Recovery Across Socioeconomic Groups and Economic Stimulus

As the Philippines transitioned into its response efforts to mitigate the effects of the COVID-19 crisis, one of the immediate interventions that was implemented by the government was the distribution of in-kind and cash aid to the poorest and most-vulnerable households in the country. Two economic stimulus packages were enacted by the government — the Bayanihan to Heal as One (Bayanihan 1) (PhP 275 billion or approximately US\$5.7 billion) and the Bayanihan to Recover as One (Bayanihan 2) (PhP 165.5 billion or approximately US\$3.4 billion).

For Bayanihan 1, as of September 14, 2020, PhP 196 billion had been disbursed through the Social Amelioration Program (SAP) under the Department of Social Welfare and Development (DSWD), most of which has gone to the Emergency Subsidy Program (ESP). These are targeted subsidies amounting to 5 to 8 thousand pesos per month, which were programmed to be given to 18 million most-vulnerable households for two months. On the other hand, Bayanihan 2 focused more on funding recovery efforts, allocating up to PhP 13 billion for cash-for-work efforts, PhP 6 billion for “individuals in crisis” and other programs of the DSWD, and PhP 4 billion for the implementation of digital learning, among other things.²⁴ Currently, there are discussions about providing another economic stimulus package to further spur the recovery of the country.²⁵

In this section, using spending as an indicator, we will first assess how households belonging to different socioeconomic groups are recovering from the pandemic. Furthermore, we will assess the impact of a government stimulus package on

the spending patterns of households. We also ask: If there had been an apparent effect, how long did this effect last? Here, we address these questions by examining the spending behavior of households across different socioeconomic groups, as tracked through monthly FMCG market research data from January 2019 to April 2021.

Households that are part of the market research panel are categorized into four socioeconomic groups: Groups AB (Upper Income), C (Middle Income), D (Low Income), and E (Very Low Income).²⁶ This socioeconomic grouping is determined through a scoring system set by Nielsen based on the appearance of the house, the presence of facilities and “must have” items (i.e., appliances and vehicles), and the occupation and educational level of the household head. For 2021, households from AB, C, D, and E were estimated to comprise 1.2 percent, 12.6 percent, 52.1 percent, and 34.1 percent of Philippine households, respectively.

Figure 5 shows trends in total FMCG spending of households from the four different socioeconomic groups. As in Figures 1 and 2, we calculated percentage differences relative to a pre-pandemic baseline based on the averages of 2019 data adjusted for prices (dashed portion of the curves). The baseline spending amount per four-week period for AB, C, D, and E households are: PhP 3,244, PhP 3,209, PhP 2,759, and PhP 2,391, respectively.²⁷ Overall, all groups showed recovery and an increasing trend in consumer spending that were above their pre-pandemic levels by November 2020. However, we emphasize that although the amounts spent by households allotted to FMCGs have shown

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