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# Where Have the Workers Gone since the COVID-19 Pandemic?

*Ma. Christina F. Epetia, John Joseph S. Ocbina,  
and Kimberly R. Librero*



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## **Abstract**

This study seeks to investigate how labor markets in the Philippines responded to the COVID-19 pandemic by decomposing the change in average annual hours of work per person and analyzing the extent of reallocation across occupations, sectors, classes of work, and nature of work. We find that the declining average hours of work before the pandemic was primarily due to the extensive margin, but the huge fall in hours of work in the first year of the pandemic was attributed to the intensive margin at a larger extent and to the extensive margin at a lesser degree. Although hours of work moderately increased later into the pandemic, the larger contribution of the change occurring at the intensive margin persisted. The same implication can be observed even when the change in average hours of work is examined by gender and age group, except for the old age bracket among women where change in average hours of work was consistently dominated by the change at the extensive margin. Furthermore, lower reallocations across occupations and sectors were seen during the pandemic, contrasting the spike in reallocations found in developed countries. That is, labor markets in the Philippines appear to be less dynamic in the face of huge economic shocks such as the COVID-19 pandemic. Although higher reallocation across classes of work can be observed for women during the pandemic, this is due to the rising employment shares of paid and unpaid family workers. Higher reallocation across nature of work also is also associated with increasing share of short-term employment. With limited social safety nets that protect worker income amid economic shocks, there appears little leeway for workers to adjust in the labor market. Workers and households should be adequately supported to protect their income and welfare, especially during economic downturns.

**Keywords:** labor market, COVID-19 pandemic, decomposition of hours worked, reallocation index

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# Where Have the Workers Gone since the COVID-19 Pandemic?

*Ma. Christina F. Epetia, John Joseph S. Ocbina, and Kimberly R. Librero<sup>1</sup>*

## 1. Introduction

The COVID-19 pandemic caused immense economic and labor market shocks that affected a wide range of workers, households, and firms, leading to the unprecedented decline in employment and hours of work (ILO, 2020, April 7). However, the magnitude of the adverse effects, as well as the speed of recovery later into the pandemic, varied across sectors and occupations (ILO, 2020, April 7; ILO, 2022, October 31). The lockdown measures implemented by several countries to contain the pandemic severely impacted workers in jobs that cannot be done remotely (e.g., Dingel and Neiman, 2020), workers in sectors that are considered non-essential (e.g., Epetia, 2021), and workers in contact-intensive sectors (e.g., Debuque-Gonzales et al., 2023). Moreover, global progress towards formalization of work has been hampered and possibly reversed during the pandemic, as informal employment is observed to be growing at the same pace as formal employment (ILO, 2022, October 31). Such developments suggest that employment dynamics could have changed over the pandemic, although it remains to be seen whether shifts in the labor market are only temporary or would last in the long term.

The immediate effects of the COVID-19 pandemic and community quarantine policy on the Philippine labor market are the huge drop in the labor force participation rate to a historical low, the climb of the unemployment rate to a two-digit figure, and the rise in the underemployment rate (Figure 1). The labor force participation rate did show a declining trend even prior to the pandemic, but the pandemic interrupted the progress towards lower unemployment and underemployment rates. Furthermore, the rise in the underemployment rate is likely linked with the reduced average hours of work (Figure 2). Together with the smaller labor force and larger pool of the unemployed, aggregate weekly hours of work plummeted, indicating that the average hours of work fell both at the intensive and extensive margins during the onset of the pandemic.

Fortunately, there are signs that the labor market has been recovering amid the easing of mobility restrictions, gradual removal of community quarantine measures, and implementation of policies aimed to mitigate the impact of the pandemic.<sup>2</sup> The labor force participation rate is showing a rising trend that, by the end of 2022, it already overtook its pre-pandemic level. The unemployment and underemployment rates fell to their pre-pandemic levels. Aggregate weekly hours of work have also been climbing after 2020. What is interesting, however, is that average weekly hours of work remain muted and lower than their pre-pandemic levels. Although the labor force has grown as the labor market recovers from the pandemic, it appears that people are working less on average. This observation is in contrast with the pre-pandemic trend where the labor force participation rate was declining, but both aggregate and average weekly hours of work were increasing. Moreover, shifts in employment shares were observed until a year into the pandemic (e.g., Debuque-Gonzales et al., 2023), although it remains to be seen whether and which of these shifts would have long-term effects on employment structure. Given these

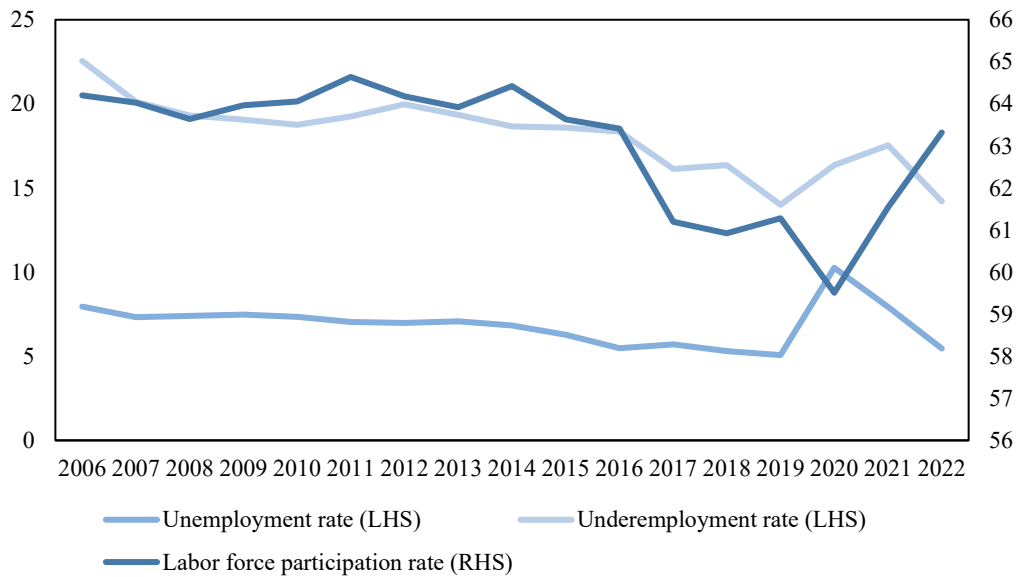
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<sup>2</sup> See Appendix 1 for the description of the policies targeted to workers and households.

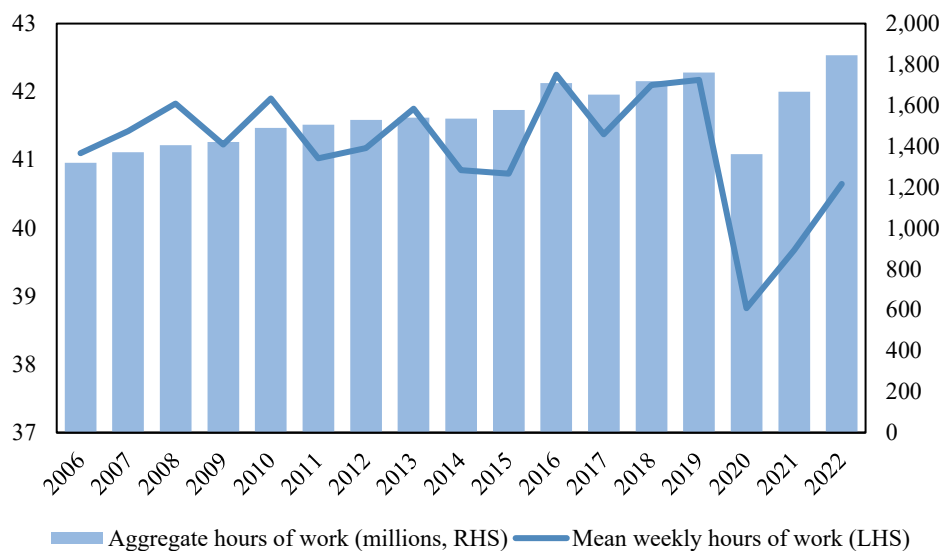
developments in recent years, this study will provide empirical evidence on whether and how employment dynamics in the Philippines have changed since the COVID-19 pandemic.

**Figure 1. Labor force participation rate, unemployment rate, and underemployment rate (%)**



Note: LHS = left-hand scale. RHS = right-hand scale.  
 Source of data: Several rounds of the Labor Force Survey Statistical Tables.

**Figure 2. Aggregate and mean weekly hours of work conditional on employment**



Note: LHS = left-hand scale. RHS = right-hand scale. The aggregate hours of work are calculated as the product of mean hours of work and the number of employed.  
 Source of data: Authors' estimates using several rounds of the Labor Force Survey.

As the government seeks to increase employability and income-earning ability of the people as the economy recovers from the pandemic, it will be of policy interest to evaluate the flexibility of the labor market in accommodating disruptions, such as the one as large as the COVID-19 pandemic. How the labor market responds to such disruptions will guide policymakers in implementing policies that can protect the welfare of workers and households, especially in the context of a developing country like the Philippines where unemployment insurance systems and social safety nets are limited at best. Hence, we seek to answer the following research questions in this study. First, to what extent do the extensive margin and intensive margin contributed to the change in aggregate hours of work before and during the pandemic? Second, was there reallocation of workers at the aggregate level across sectors, occupations, classes of work, and nature of work during the pandemic, and which of these were driving the change? Lastly, how do the employment dynamics of men and women differ?

We find that the change in the average hours of work before the pandemic was largely due to reduced hours of work among the employed (intensive margin) and a lesser degree to lower employment rate (extensive margin). There was also lower reallocation across occupations and sectors during the pandemic, but higher reallocation was observed across classes of work for women and across nature of work for both men and women. The higher reallocations in these aspects, however, imply reduced employment quality, as the shares of paid and unpaid family workers and short-term employment are found to have increased.

The paper follows this flow. Section 2 provides a review of related literature. Section 3 describes the methodology applied in this study. Section 4 discusses the results. Section 5 concludes the paper.

## **2. Review of Related Literature**

The contribution of intensive and extensive margins to the change in aggregate hours of work appears to differ between the onset of the pandemic and the post-pandemic period. In the United States (US), Gupta et al. (2023) observed that, between March and April 2020, the labor market response to the COVID-19 pandemic and associated policies mostly occurred at the extensive margin and there was little effect on hours of work. They explained that the incentives for higher unemployment benefits warranted a decline in employment rather than hours of work. The reduction in hours of work at the extensive margins appears to be a regularity observed in previous recessions (Fabrizio et al., 2021). Unlike in the past recessions, however, women's employment losses were larger compared to that of men during the COVID-19 pandemic (Fabrizio et al., 2021; Albanesi and Kim, 2021; Alon et al., 2020). Alon et al. (2020) attributed this to women's overrepresentation in the services sector which was badly hit during lockdowns and women's increased childcare responsibilities when school and childcare facilities were closed.

In contrast, Lee et al. (2023) and Faberman et al. (2022) saw the dominance of the intensive margin in explaining the reduction in hours of work later into the pandemic, despite using different methods. Applying the decomposition technique by Blundell et al. (2011), Lee et al. (2023) found that the intensive margin largely accounted for the decline in hours of work between 2019 (pre-pandemic) and 2022 (post-pandemic). The decline in hours of work were also larger for men than for women. Among men, the drop along the intensive margin was larger for college graduates than those with less education, for prime-age workers than older workers, and for those who already worked long hours and had higher earnings.



Faberman et al. (2022) constructed a measure of labor market underutilization called the Aggregate Hours Gap (AHG) and found that the sharp increase of the AHG during the pandemic disappeared by the end of 2021. This indicates a drop in the desired hours of work (i.e., along the intensive margin), which be observed across demographic groups. They also found that the incidence of searching only for part-time work because of the pandemic is highest for women, prime-age workers, and those with less than a college degree.

Both Lee et al. (2023) and Faberman et al. (2022) concluded that the US labor market is tighter than what is implied by the unemployment rate, thereby indicating that hours of work should also be examined by policymakers to evaluate labor market conditions better.

In the Philippines, an Asian Development Bank (ADB) (2021) report found that intensive margin of adjustments accounted for majority of working hour losses at the onset of pandemic. This finding is consistent with Franklin and Labonne (2019) that examined adjustments in the labor market due to large, temporary economic shocks in the form of strong typhoons in the Philippines. They found that workers in areas affected by strong typhoons experienced fall in hours of work with no change in employment level. They explained that adjustments occurred along the intensive margin as a risk-sharing mechanism between workers and firms in the absence of unemployment insurance in the country.

In the post-pandemic recovery, women's employment losses appear to be persistent in developed countries. In the US, their labor force participation remained below pre-pandemic level even after schools reopened (Alon et al., 2022). In Japan, Fukai et al. (2023) observed that for married women with children, impacts on the extensive margin persisted throughout 2020, while the effect on the intensive margin was not affected from June 2020 onward.

In a developing country context, Alon et al. (2022) also saw substantial employment reduction for women in Nigeria at the start of the pandemic, although they experienced a quick recovery and expansion of employment by February 2021 relative to men. Women who continued working also worked more hours than what they did prior to the COVID-19 pandemic. This reflects the insurance role of women's labor supply for poorer households. The need to make up for income losses may have induced many women to work. In Mexico, Hoehn-Velasco et al. (2022) found that hours of work declined and recovered similarly for men and women and were nearly back to baseline level by the second quarter of 2021. It is to be noted that men's employment recovered only slightly faster than women. However, the authors explained that while labor markets have recovered, much of the employment gains occurred in the informal sector.

Another aspect in the change in employment dynamics that have been of interest in the literature is the reallocations within the labor market. In the United Kingdom (UK), Carrillo-Tudela et al. (2021) saw an increased reallocation towards growing occupations during the pandemic. However, while net job mobility has risen, the workers in occupations severely affected by labor market shocks seem to be less willing or less able to switch occupations. In the US, Albanesi and Kim (2021) predicted that jobless recovery may occur as job losses are associated with the long-run decline in jobs in the manufacturing sector and those with routine tasks. They assessed that such job losses are less likely to be reinstated once the economy recovers from the recession caused by pandemic.

However, Forsythe et al. (2022) found little evidence of excess reallocations despite predictions that work arrangements would be permanently changed. In a US survey, Barrero et al. (2021) argued that the benefits of a remote work will be experienced widely but will affect mainly the better educated and high earners. Nonetheless, Forsythe et al. (2022) observed that the labor market reallocated away from low-skilled jobs to some degree, implying that people previously working in these jobs are finding better jobs. A policy recommendation provided by ADB (2021) and Cabegin (2022) is for stronger policies towards formalization of informal workers. Also, Dingel and Neiman (2020) proposed social insurance for those jobs that are less flexible for remote work which, in turn, tend to concentrate on less educated workers and women (Adams-Prassl et al., 2020).

### 3. Data and Methodology

#### 3.1 Data and Sample

This study uses the Labor Force Survey (LFS), a nationally representative source of labor data produced by the Philippine Statistics Authority (PSA). The LFS is used to estimate the official labor statistics of the Philippines. The LFS was published quarterly in January, April, July, and October until the end of 2020, but shocks due to the COVID-19 pandemic necessitated the production of higher-frequency statistics. The PSA started publishing the LFS monthly in February 2021. For consistency, we used the quarterly rounds of the LFS from January 2012 to April 2022. We note that there are data breaks in terms of standard classifications for occupations and sectors, so the period that can be covered in these instances is shorter. The 2012 Philippine Standard Classification of Occupation (PSOC) was applied starting April 2016, while the 2009 Philippine Standard Industrial Classification (PSIC) was implemented in April 2012. Finally, the sample consists of the working-age population, i.e., those aged 15 years and above. Survey weights are used in the estimates.

#### 3.2 Decomposition of Hours of Work

We follow Blundell et al.'s (2011) derivation in decomposing the change in hours of work into the extensive margin and the intensive margin. Let a group be denoted by  $j$  (e.g., by age and gender) and year be denoted by  $t$ . Let  $H_t$  denote the overall average hours per person in year  $t$ .

$$H_t = \sum_{j=1}^J q_{jt} H_{jt} = \sum_{j=1}^J q_{jt} (h_{jt} p_{jt})$$

$q_{jt}$  is the population share of group  $j$  in year  $t$ .  $H_{jt}$  represents the average hours per person for each group, which is the product of hours per worker for group  $j$  in year  $t$  as denoted by  $h_{jt}$  and the employment rate of group  $j$  in year  $t$  as denoted by  $p_{jt}$ . In other words, the average hours per person is determined by the average hours of work per worker and the size of employment relative to the working-age population.

What of interest is decomposing the change in yearly hours worked per person,  $H_t - H_{t-1}$ , into extensive and intensive margins. Holding the population structure constant as in year  $t - 1$ , the change due to the behavior of group  $j$  is measured as in a Laspeyres index:

$$\Delta_{jt} = q_{jt-1}(H_{jt} - H_{j,t-1}).$$

The total change across all groups is:  $\Delta_t = \sum_{j=1}^J \Delta_{jt}$ . Thus:

$$H_t - H_{t-1} = S_t + \Delta_t$$

where  $S_t$  is the structural effect due to the change in the composition of the population given by  $\sum_{j=1}^J H_{jt}(q_{jt} - q_{j,t-1})$ .

Suppose that any possible measure of the intensive component  $I_j$  would have the same sign as the difference of the hours worked per worker between  $t$  and  $t - 1$ , i.e.,  $\Delta h_j = h_{jt} - h_{j,t-1}$ . With the assumption of linearity, the change  $\Delta_j$  can be expressed as the sum of an intensive component,  $I_j$ , and an extensive component,  $E_j$ .

$$\Delta_j = I_j + E_j = p_{Ij}\Delta h_j + h_{Ej}\Delta p_j$$

Suppose  $p_{Ij}$  is in the interval  $[p_{j,t-1}, p_{jt}]$ . The intensive bounds are given by  $I_j \in [p_{j,t-1}(h_{jt} - h_{j,t-1}), p_{jt}(h_{jt} - h_{j,t-1})]$ . The extensive bounds are given by  $E_j \in [h_{j,t-1}(p_{jt} - p_{j,t-1}), h_{jt}(p_{jt} - p_{j,t-1})]$ .

Thus, at the limits, the change in total hours for any category of worker satisfies two polar exact statistical decompositions.

$$\begin{aligned} \Delta_{jt} &= q_{jt-1} \left\{ \underbrace{p_{jt}(h_{jt} - h_{j,t-1})}_{intensive} + \underbrace{h_{j,t-1}(p_{jt} - p_{j,t-1})}_{extensive} \right\} \\ \Delta_{jt} &= q_{jt-1} \left\{ \underbrace{p_{j,t-1}(h_{jt} - h_{j,t-1})}_{intensive} + \underbrace{h_{jt}(p_{jt} - p_{j,t-1})}_{extensive} \right\} \end{aligned}$$

Following Lee et al. (2023), we apply the second one to decompose of hours of work. The intensive margin refers to the change in the average hours of work while holding employment rate constant. The extensive margin refers to the change in the employment rate while holding average hours of work constant.

A higher frequency of labor market data (e.g., monthly or weekly) is ideal when measuring annual hours of work, because hours of work vary within the year for several reasons such as seasonality, vacations, holidays, and the like. Since we are using the quarterly rounds of the Philippine LFS, we make some assumptions in estimating annual hours of work.

The employment rate refers to the share of the employed in the working-age population. The annual employment rate is estimated by averaging the quarterly employment rate:

$$p_{jt} = \frac{1}{4} \sum_{k=1}^4 \frac{W_{jkt}}{N_{jkt}}$$

where  $W_{jkt}$  is the number of employed persons for group  $j$  in quarter  $k$  in year  $t$ , and  $N_{jkt}$  is the number of working-age persons for group  $j$  in quarter  $k$  in year  $t$ .

On the assumption that each person works the same weekly hours in a given quarter (with 13 weeks), the average hours per worker for group  $j$  in year  $t$  is:

$$h_{jt} = \frac{1}{W^A} \sum_{k=1}^4 \sum_{i=1}^W (h_{ikt}^a * 13)$$

$h_{ikt}^a$  refers to the total number of hours worked for all jobs for worker  $i$  during the reference week in quarter  $k$  in year  $t$ .  $W^A$  denotes the average number of employed across quarters.

### 3.3 Reallocation Index

To understand how much employment composition has changed over the pandemic, Forsythe et al. (2022) utilized a reallocation index (denoted by  $R_t$ ) which measures the minimum fraction of employment needed to move across groups to maintain the same distribution as three years prior. It is calculated as the sum of absolute deviations from the employment share of  $G$  labor markets three years prior divided by two.

$$R_t = \frac{1}{2} \sum_{g \in G} \left| \frac{Emp_{g,t}}{\sum_{g \in G} Emp_{g,t}} - \frac{Emp_{g,t-3}}{\sum_{g \in G} Emp_{g,t-3}} \right|$$

Forsythe et al. (2022) explained that if groups were represented by sectors, then the reallocation index measures how rapidly the employment structure changes across sectors within three years.

## 4. Results and Discussion

### 4.1 Decomposition of Hours of Work

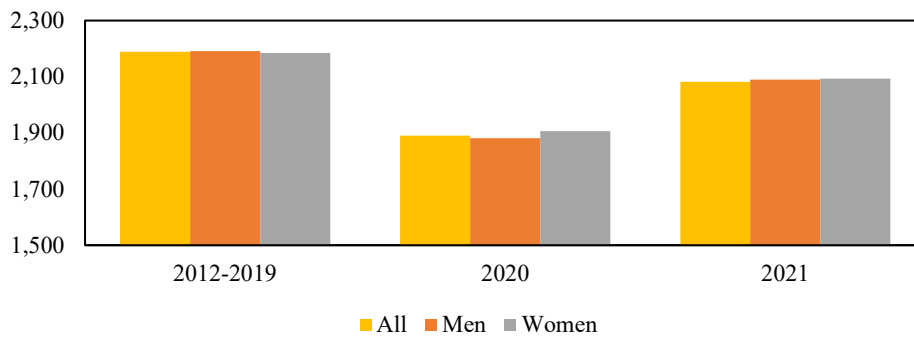
Figure 3 shows the average annual hours of work per person (simply “average hours of work” moving forward), which we estimated based on Blundell et al.’s (2011) derivations and on our assumptions in using available data from the LFS. Between 2012 and 2019, the average hours of work were 2,189 hours. This fell to 1,891 hours in 2020, which is roughly equivalent to two months of regular, full-time work. The hours of work rose in 2021 but had not yet gone back to pre-pandemic levels as it averaged to 2,082 hours.

Looking at the estimates by gender, men had a slight work-hour advantage of 6.5 hours over women before the pandemic. In the first year of the pandemic, men encountered a larger decline

in average hours of work by 310 hours compared to women by 279 hours, thus reversing the gender gap pattern before the pandemic. The women’s work-hour advantage narrowed from 24 hours in 2020 to 4 hours in 2021, as men’s hour of work grew faster by 208 hours than that of women by 188 hours. The relatively lower effect on women’s average hours of work at the peak of the COVID-19 pandemic could be associated with the idea that, during economic crises, women are mobilized to work (the added worker effect). However, as the economy recovers, the temporary added worker effect tapers off, which could explain the narrowing of the work-hour advantage of women during the second year of the pandemic.

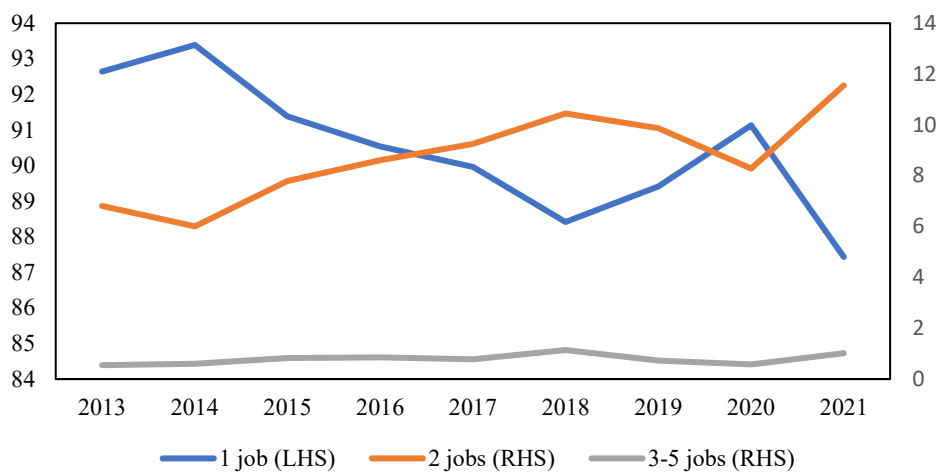
We also examine how the large change in hours of work over the course of the pandemic is associated with the number of jobs held by the employed (Figure 4). Between 2014 to 2018, the share of the employed holding multiple jobs had been increasing, but this pattern reversed in 2020. Since 2015, the share of the employed holding only one job peaked in 2020 which coincided with a decreased share for those holding two or more jobs. The reversal is not surprising given the amount of job loss that occurred during the onset of the pandemic. As such, this event could have also partially contributed to the lowering of average hours of work in 2020. The change in employment shares appears to be only temporary, however, as relatively more of the employed took up more than one job in 2021.

**Figure 3. Average annual hours of work per person**



Source: Authors’ estimates using several rounds of the Labor Force Survey.

**Figure 4. Share of total employed by number of jobs held during the reference week (%)**

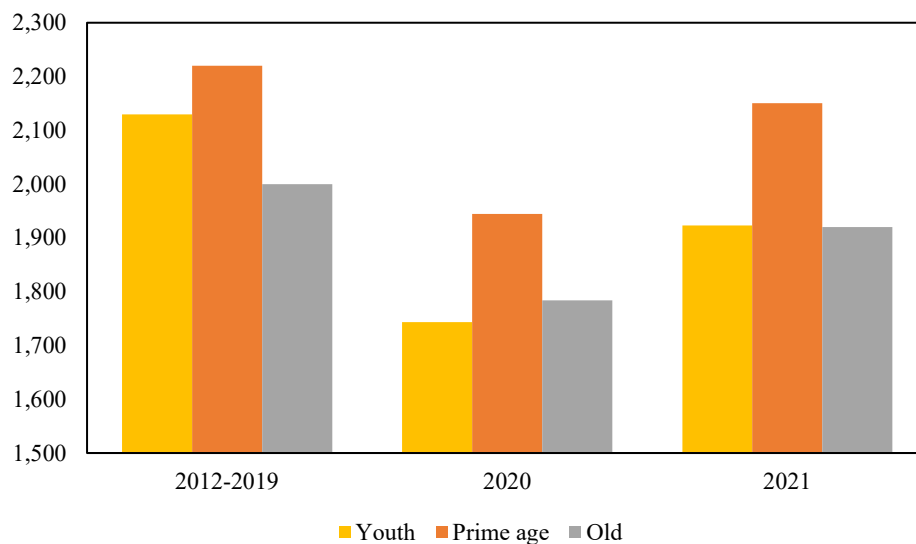


Note: LHS = left-hand scale. RHS = right-hand scale.

Source of data: Authors’ estimates using several rounds of the Labor Force Survey.

We are also interested in the average hours of work by age groups as shown in Figure 5. As expected, the prime-age group worked the most on average in terms of annual hours of work (2,220), followed by the youth (2,130) and old age group (2,000), respectively, between 2012 and 2019. Nonetheless, the huge decline in hours of work in the first year of the pandemic was reflected across all age groups, with the youth seemingly facing the largest setback. The youth's hours of work dropped by 386 hours, the prime-age group by 276 hours, and the old by 216 hours. We emphasize that none of the age groups displayed pre-pandemic levels of hours of work as of 2021. From 2020 to 2021, average hours of work only rose by 180 hours among the youth, 206 hours among the prime-age group, and 136 hours among the old. Furthermore, it is worth noting that the work-hour gap between the youth and the old had become almost negligible, as the youth's average hours of work had been recovering faster than that of the old in the second year of the pandemic.

**Figure 5. Average annual hours of work per person by age group**



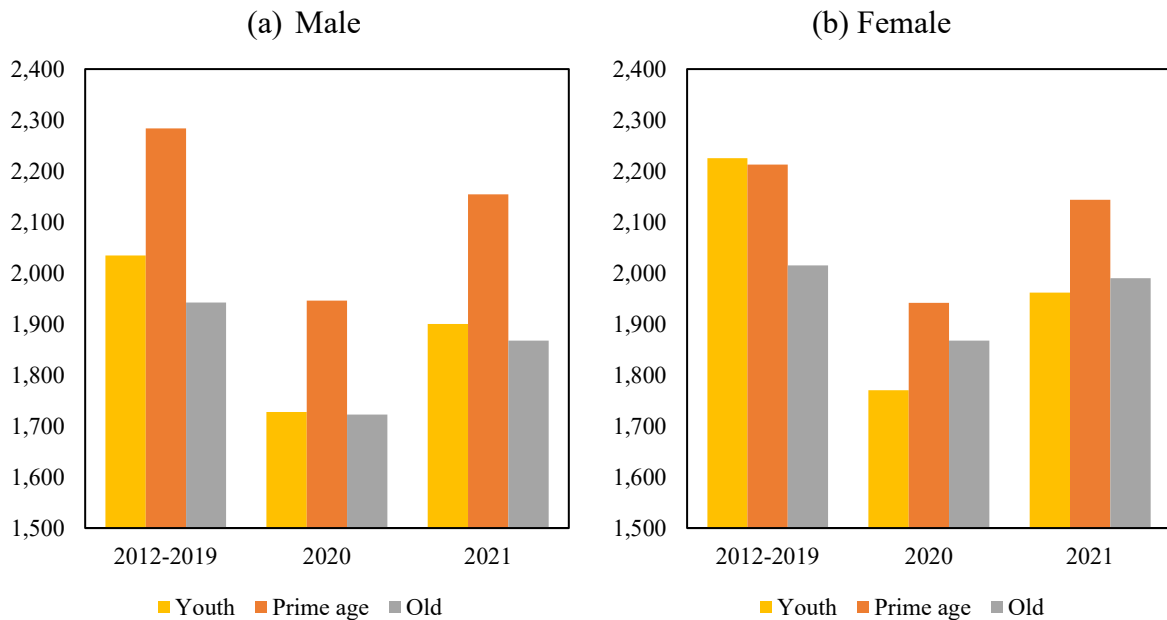
Source: Authors' estimates using several rounds of the Labor Force Survey.

Average hours of work are further disaggregated by age group and gender in Figure 6. Panel (a) shows the disaggregation for males, where the prime-age group was clearly dominating in terms of hours of work. Between 2012 and 2019, the prime-age group worked 2,284 hours annually on average, while the youth worked 2,035 hours and the old group worked 1,942 hours. In 2020, average hours of work fell in all age groups, and the work-hour advantage of the youth over the old narrowed significantly. However, average hours of work among the youth rose faster than of the old in 2021, leading to higher average hours of work for the youth. While the hours of work rose across all age groups, none of them had obtained yet their pre-pandemic levels as of 2021. Average hours of work stood at 1,900 hours among the youth, 2,155 hours among the prime-age group, and 1,868 among the old.

Panel (b) shows the disaggregation for females. What makes these estimates different from the overall and male estimates is that the youth were exhibiting the largest hours of work on average prior to the pandemic (2,225), followed closely by the prime-age women (2,213) and trailed by the old (2,015). Compared to men, women tend to bear most of the childcare and household work, especially during childbearing age, which could explain the discrepancy. In the first year of the pandemic, however, the youth's average hours of work fell at a much faster rate, so we observe the lowest level of average hours of work among the youth. This pattern

persisted in 2021 as the average hours of work rose faster among the prime-age group and the old, compared to the youth. Between gender and age groups, it appears that it is the female youth's employment prospects that had been the most severely hit by the COVID-19 pandemic.

**Figure 6. Average annual hours of work per person by age group and gender**

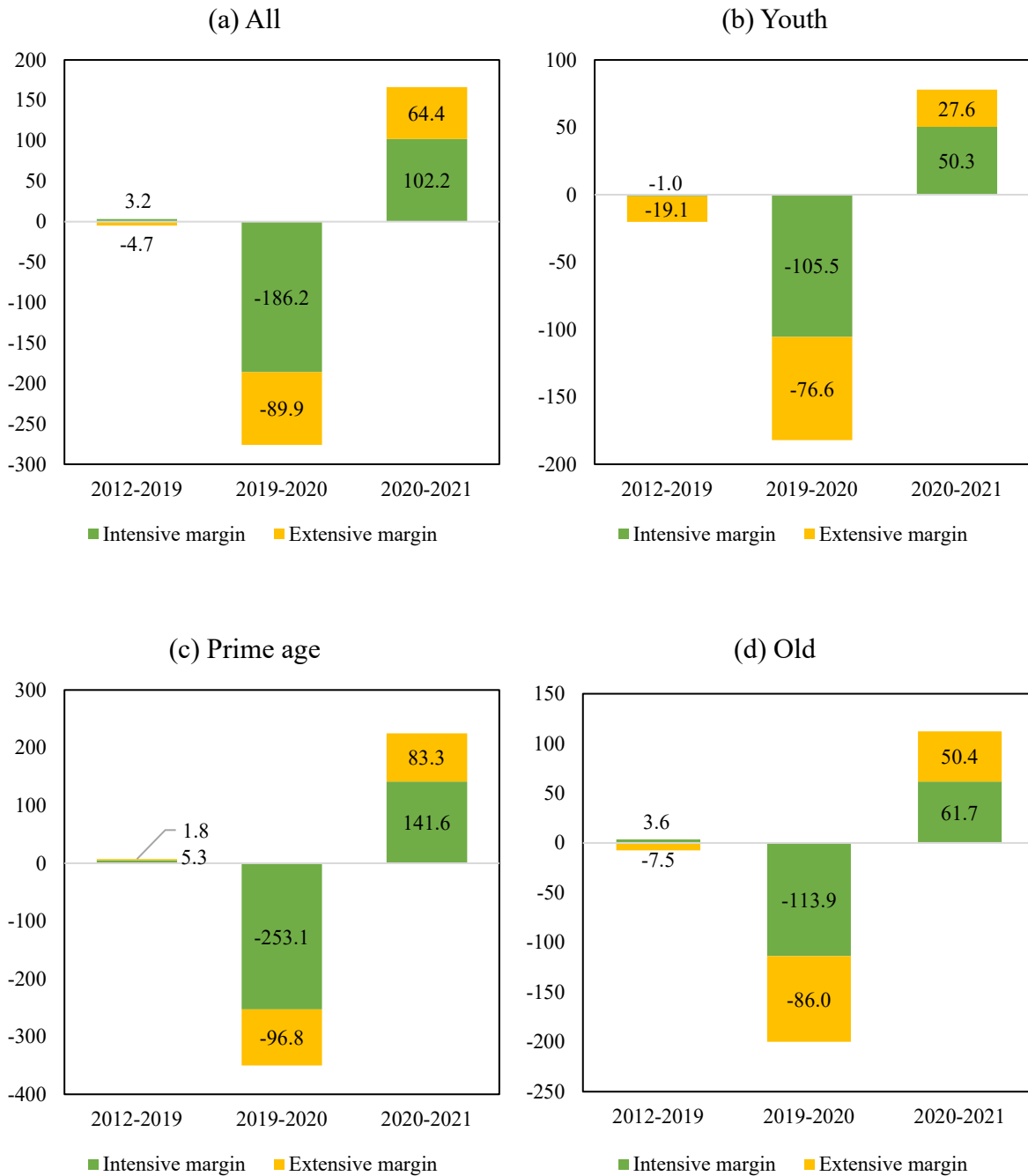


Source: Authors' estimates using several rounds of the Labor Force Survey.

To see whether the change in average hours of work is primarily attributed to the intensive margin or the extensive margin, we decomposed the average hours of work as shown in Figure 7. Panel (a) displays the decomposition using the sample of all working-age individuals. Between 2012 and 2019, the average change in average annual hours of work had been declining by 1.5 hours annually. This is because the negative change due to the extensive margin more than offsets the positive change due to the intensive margin. It is consistent with the pattern of falling labor force participation rate and increased hours of work prior to the pandemic.

Between 2019 and 2020, the average hours of work dropped both at the intensive and extensive margins, with the intensive margin contributing to the change more than twice at 186.2 hours than the extensive margin at 89.9 hours. This suggests that, despite the sharp increase in the unemployment rate and drop in the labor force participation rate in 2020, the decline in hours of work among the employed disproportionately contributed to the change in the average hours of work. We note that this is also the period where a large share of the employed reported that they had zero hours of work during the reference week. It is thus possible that people would rather keep their jobs and work fewer hours (even zero hours) than lose their jobs amid economic shocks, possibly with the expectation that such shocks are only temporary and short-lived. Between 2020 and 2021, the rise in average hours of work again largely occurred at the intensive margins, i.e., the partial recovery in average hours of work is mostly because people are working more hours and the increase in employment contributed by a lesser extent.

**Figure 7. Decomposition of change in average hours of work per person**



Source: Authors' estimates using several rounds of the Labor Force Survey.

Panels (b), (c), and (d) show the decomposition of the change in average hours of work by age group. Similar to the aggregate findings, the change in average hours of work before the pandemic was mostly attributed to the extensive margin, while that of during the pandemic to the intensive margin. Still, we want to highlight some insights from the estimates. First, the decline in employment for the youth was relatively larger compared to the other age groups prior to the pandemic, as evidenced by the size of the extensive margin. Between 2012 and 2019, the change in average hours of work among the youth at the intensive margin had been



increasing only by one hour a year while that of the extensive margin had been decreasing by as much as 19.1 hours a year.

Second, only the prime-age group exhibited increasing hours of work prior to the pandemic. Between 2012 and 2019, average hours of work among the prime-age group increased by 7.1 hours a year, 5.3 hours of which was due to the extensive margins and 1.8 hours due to the intensive margins. This implies that, in contrast to the other age groups, the employment rate of the prime-age group had been increasing within this period, aside from the hours of work per worker.

Third, the largest decline in hours of work between 2019 and 2020 (349.9 hours) occurred among the prime-age group, i.e., the age group who had been working the most in terms of hours prior to the pandemic. Much of the decline was due to the intensive margin which was more than twice as large as the decline due to the extensive margin. For the youth and the old, the decline attributed to the intensive margin was also greater than that of the external margin, although not as large as the difference observed for the prime-age group.

Fourth, the increase in hours of work between 2020 and 2021 for all age groups both at the intensive and extensive margins were not sufficient to compensate for the loss in hours of work in the first year of the pandemic.

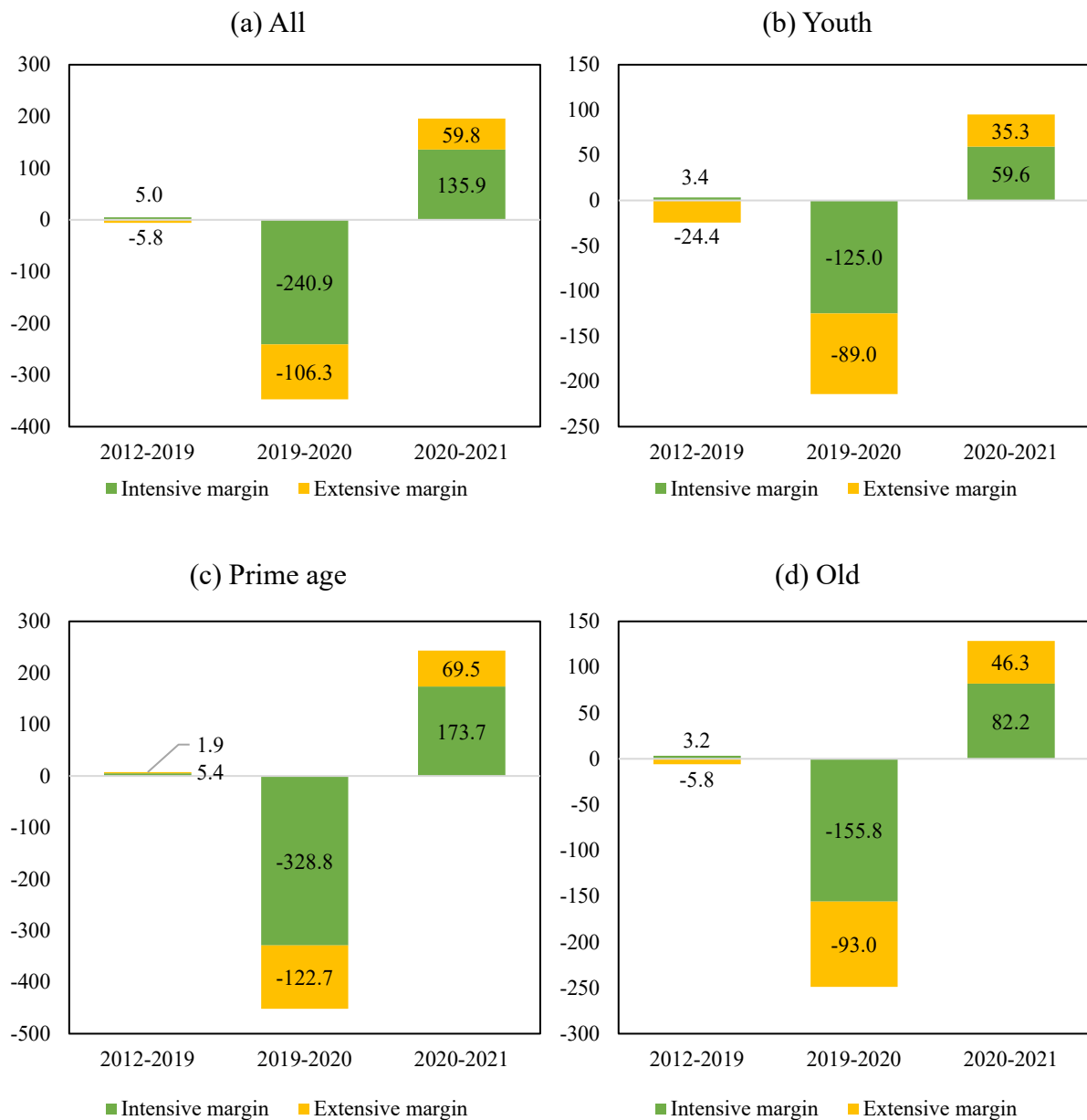
We also generated estimates by gender. In Figure 8, we decomposed the change in average hours of work for males. Before the pandemic, average hours of work had been falling by a small amount of 0.8 hour per year because of the negative change at the extensive margin. The youth mostly contributed to this falling trend, where the fall in hours of work at the extensive margin was 24.4 hours, while the increase at the intensive margin was only at 3.4 hours. Between 2019 and 2020, average hours of work decreased by as much as 347.2 hours, nearly two-thirds of which was attributed to the intensive margin. This time, it was the prime-age group which contributed to the huge aggregate fall in average hours of work for men. Recovering the hours of work had been slow for men as it only rose by 195.7 hours in 2021. Much of the increase in the average hours of work between 2020 and 2021 was at the intensive margins.

The estimates for women are shown in Figure 9. Compared to men, the fall in average hours of work among women prior to the pandemic was larger at 3 hours per year, which is due to the negative change at the extensive margins and a much smaller positive change at the intensive margins. The decreasing average hours of work among women between 2012 and 2019 were due to the youth and the old. The fall in average hours of work among the female youth prior to the pandemic was attributed to both intensive and extensive margins. The drop observed among the female old age group was also prominent, although this was because the relatively larger negative change at the extensive margin compared to the positive change at the intensive margin. We note, though, that prime-age women showed increasing average hours of work, which was primarily attributed to the extensive margin.

However, the drop in the average hours of work was smaller among women than men at 204.4 hours during the first year of the pandemic. Similarly, the largest decline can be observed in the prime-age group. The average hours of work also increased in 2021, but this is not sufficient to recover the hours lost in 2020. Much of the change in the average hours of work during the pandemic occurred at the intensive margins for the youth and the prime-age group. On the other

hand, the change in average hours of work during the pandemic for the old was greater at the extensive margins than at the intensive margins.

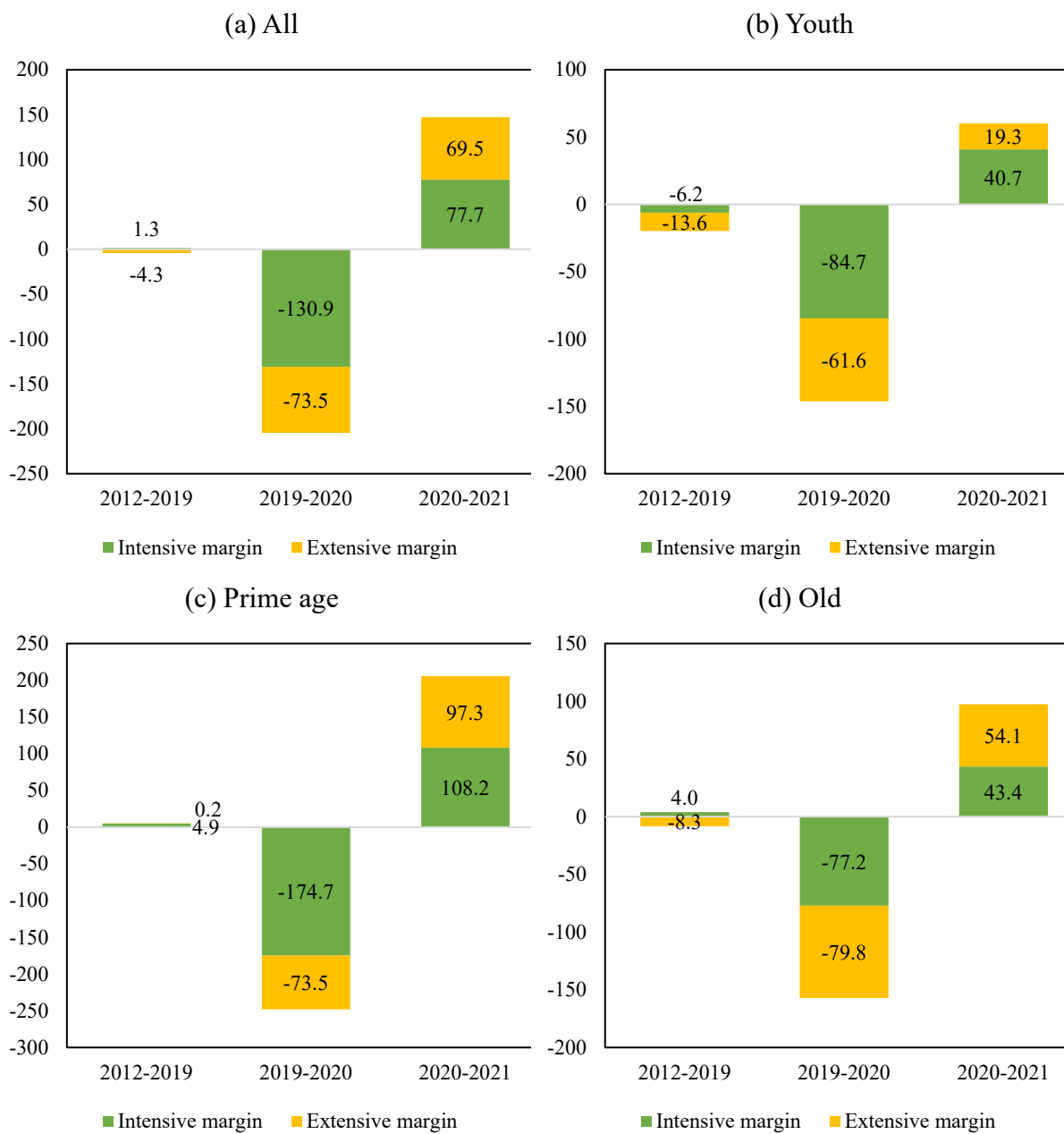
**Figure 8. Decomposition of change in average annual hours of work per person–Male**



Source: Authors' estimates using several rounds of the Labor Force Survey.

We see that the change in average hours of work mostly occurred at the extensive margins for both men and women prior to the pandemic, while the change was attributed more to the intensive margins during the pandemic. The same implication can be observed even when the change in average hours of work is examined by age group, except for the female old age bracket whose change in average hours of work was consistently dominated by the change at the extensive margins.

**Figure 9. Decomposition of change in average annual hours of work per person–Female**

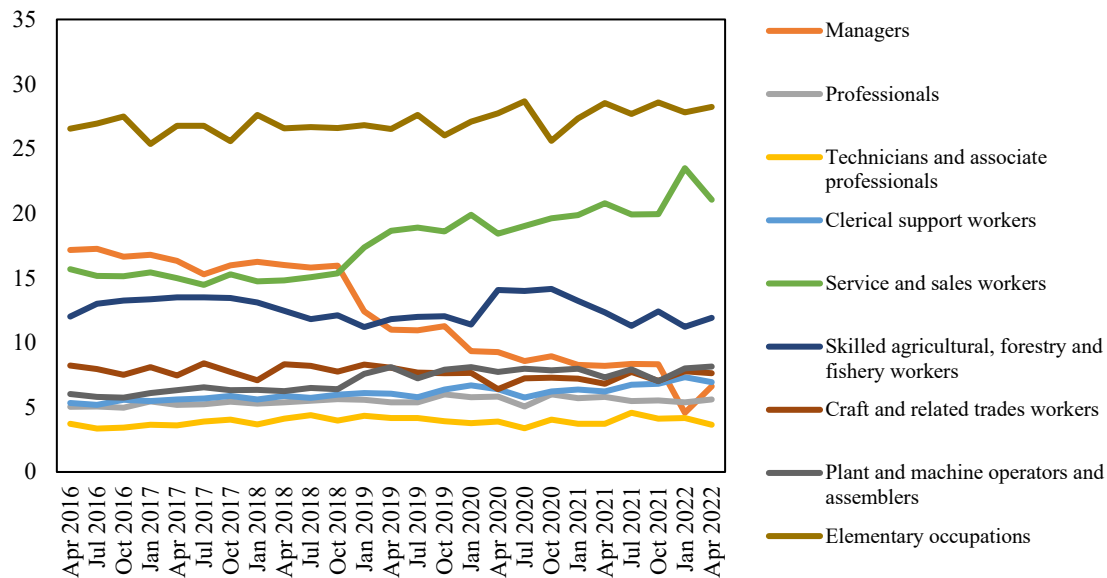


Source: Authors' estimates using several rounds of the Labor Force Survey.

## 4.2 Reallocation Across Occupations

In this section, we analyze the extent of reallocations that occurred in the labor market during the COVID-19 pandemic. A prominent shift that was observed during the onset of the pandemic is the increase in the employment share of the skilled agricultural, forestry, and fishery workers which is accompanied by a dip in services and sales workers (Figure 10). However, the fall in the employment shares of services and sales workers appears to be temporary, as it went back to its increasing trend in the second half of 2020. The rising employment share of skilled agricultural, forestry, and fishery workers was also not sustained, returning to its pre-pandemic level by July 2021.

**Figure 10. Employment shares by occupation (%)**



Note: Excludes armed forces.

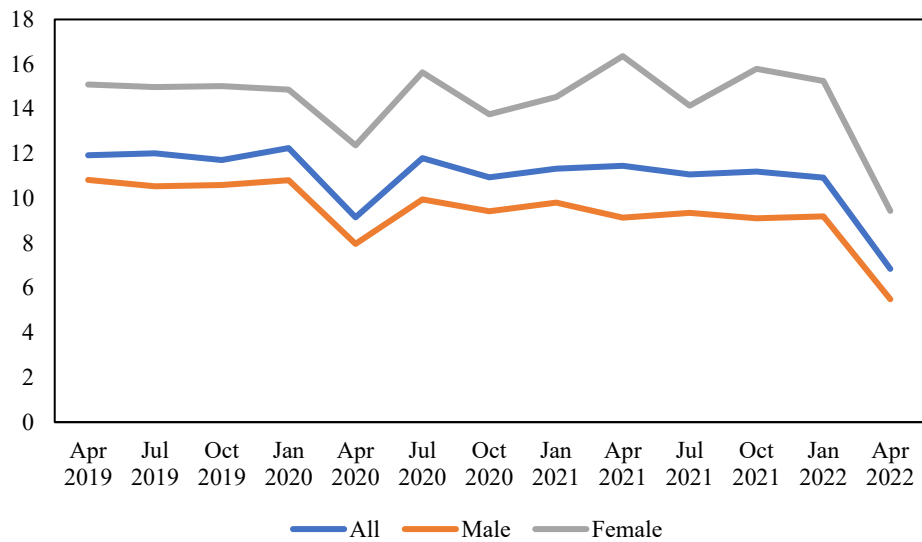
Source: Authors' estimates using several rounds of the Labor Force Survey.

Figure 11 displays the trend in the reallocation index between April 2019 and April 2022 using the two-digit occupations of the 2012 Philippine Standard Occupational Classification (PSOC). The period is quite short, so the interpretation of the reallocation index may be limited. There was a fall in the reallocation index  $R_t$  in April 2020 for both men and women, indicating lower reallocation across occupations at the onset of the pandemic. This also suggests that the shifts observed in employment shares were not large enough to see an increased occupational reallocation. The lower extent of reallocation perhaps stemmed from the strict mobility restrictions that were imposed in this period. Some establishments shifted to remote work arrangements in response to the restrictions, but available estimates showed that only a small share of the employed were in occupations where all tasks are considered “teleworkable” (Generalao, 2021), hence likely limiting the contribution of these work arrangements to quicker reallocation.

The pattern right after April 2020, however, diverged between genders. While the level of reallocation had gone back to the pre-pandemic level and seemed to have become stable for men, it had become relatively erratic for women. Nonetheless, for both men and women,  $R_t$  displayed a steep decline in April 2022. More recent data is still needed to see whether the fall in reallocation was as short-lived as in April 2020.

To see which occupations are possibly driving the gender divergence in trend for  $R_t$ , we calculated the change in employment share in terms of the ratio between the current quarter and the same quarter in 2019. Figure 12 shows the change in employment shares for occupations that had exhibited huge fluctuations between January 2020 and April 2022. Deviations in employment shares for women seemed to fluctuate more than what we can observe from that of men, which could explain the relatively less stable  $R_t$  for women. Nonetheless, except for a few occupations like production and specialized managers and subsistence farmers, fishers, hunters, and gatherers, the occupations with the largest deviations had been converging towards their pre-pandemic shares.

**Figure 11. Reallocation index–Occupation**

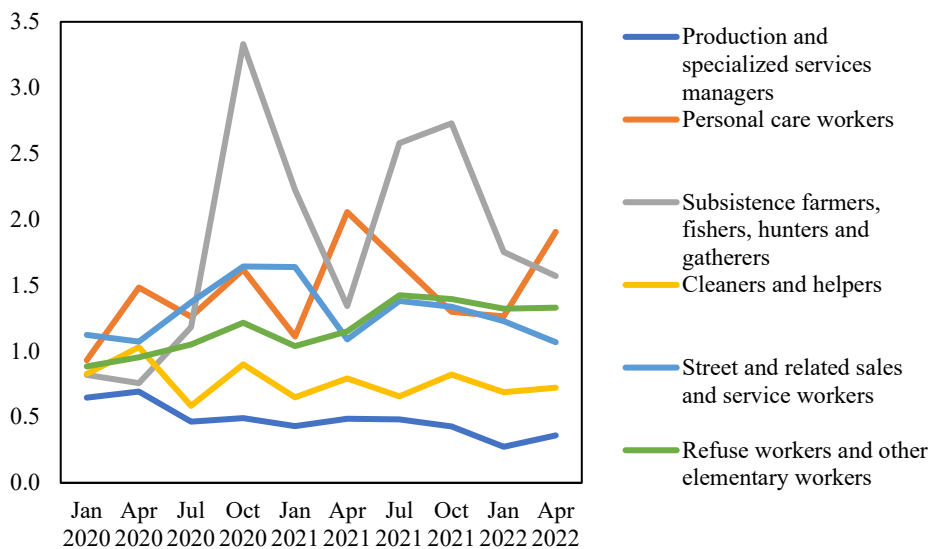


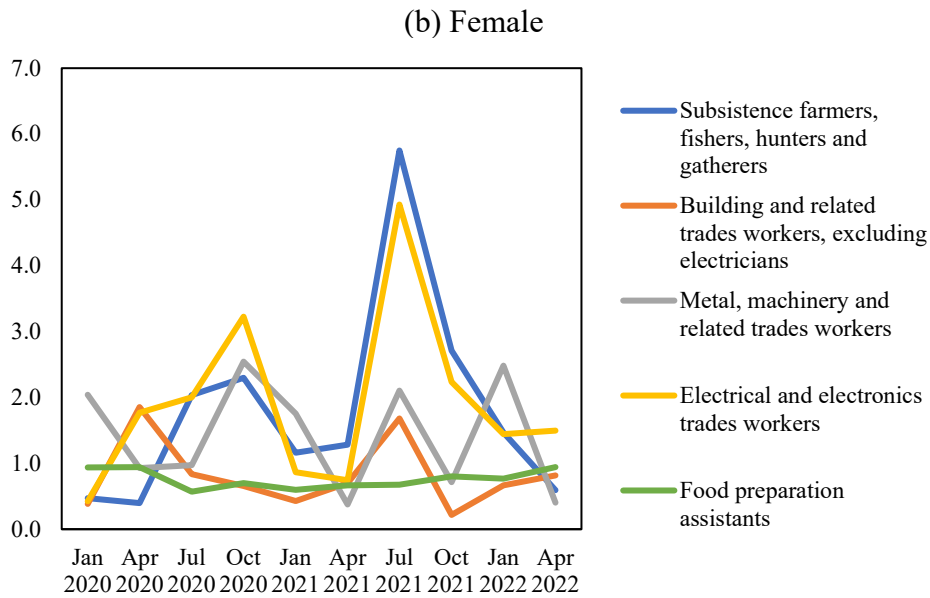
Note: The Philippine Statistics Authority started to apply the 2012 Philippine Standard Occupational Classification (PSOC) only in April 2016. Hence, April 2019 is the earliest period available for the reallocation index to be calculated.

Source: Authors' estimates using several rounds of the Labor Force Survey.

**Figure 12. Change in employment shares by gender–Occupations with huge fluctuations**

(a) Male





Note: Change in employment shares is calculated as the ratio between employment share in current quarter and in the same quarter in 2019.

Source: Authors' estimates using several rounds of the Labor Force Survey.

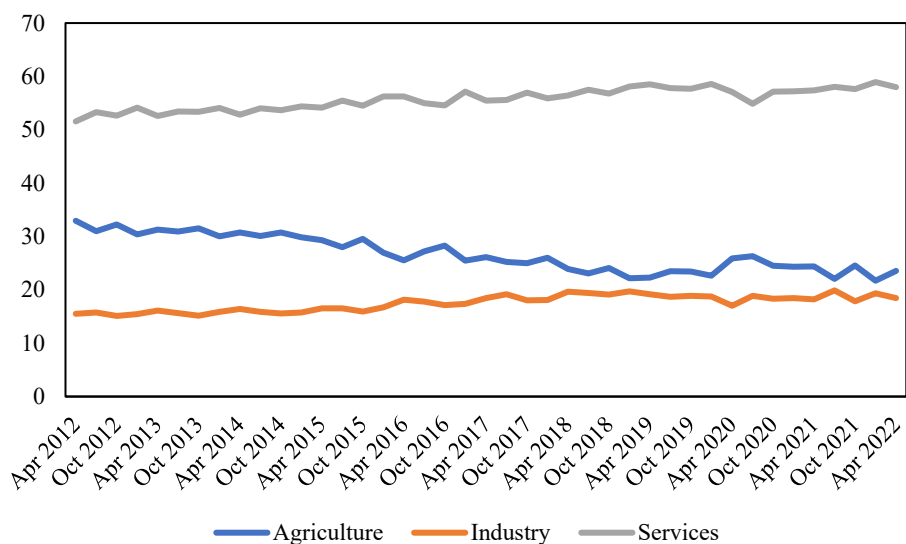
### 4.3 Reallocation Across Sectors

Comparable to the pattern found in occupational employment, agricultural employment share rose at the onset of the pandemic, which was accompanied by lower employment shares in industry and services (Figure 13). Likewise, the change in the pattern appeared to be temporary—at least in terms of broad sectors—as the trend in sectoral employment shares is returning to its pre-pandemic trend by late 2020.

Figure 14 shows the estimates of the  $R_t$  from April 2015 to April 2022 using the sections of the 2009 Philippine Standard Industrial Classification (PSIC). At the aggregate,  $R_t$  had been lower since January 2020 compared to how it was from 2017 to 2018. This implies that low sectoral reallocation had been occurring when the Philippines faced a negative growth rate in the first quarter of 2020, and that sectoral employment had not been as dynamic since then. Generating separate estimates by gender, however, provides different trends. Sectoral reallocation among men has remained relatively lower since January 2020, but that of women appears to have gone back to the reallocation pattern right before the pandemic. This suggests that, in terms of sectoral employment, some adjustments occurred for women but not so much for men.

Figure 15, which shows the change in employment shares, supports this observation. For men, most sectors with large fluctuations in employment shares during the pandemic displayed convergence towards their 2019 shares by 2022. For women, many sectors still appeared to exhibit considerable deviation from their 2019 employment shares, such as mining and quarrying; electricity, gas, steam, and air conditioning supply; water supply, sewerage, waste management, and remediation activities; real estate activities; and administrative and support service activities. Nonetheless, the extent of reallocation during the pandemic quarters was still not prominent enough to conclude that large shifts in the sectoral labor market occurred. Except for administrative and support service activities with 4.8 percent employment share in 2022, these occupations have very small employment shares (less than 1 percent) to influence the extent of reallocation.

**Figure 13. Employment shares by sector (%)**



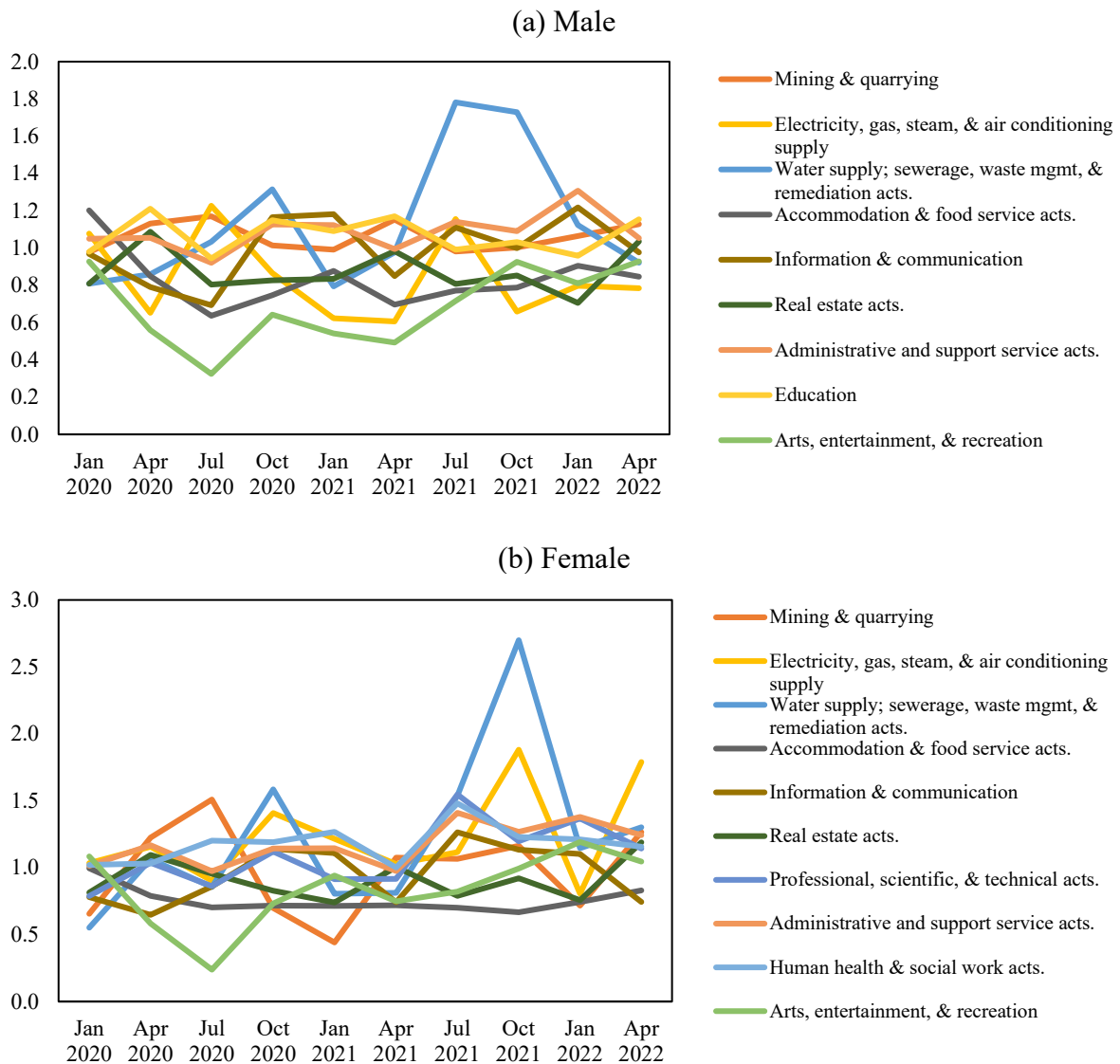
Source: Authors' estimates using several rounds of the Labor Force Survey.

**Figure 14. Reallocation index–Sector**



Source: Authors' estimates using several rounds of the Labor Force Survey.

**Figure 15. Change in employment shares by gender–Sectors with huge fluctuations**



Note: Change in employment shares is calculated as the ratio between employment share in current quarter and in the same quarter in 2019.

Source: Authors' estimates using several rounds of the Labor Force Survey.

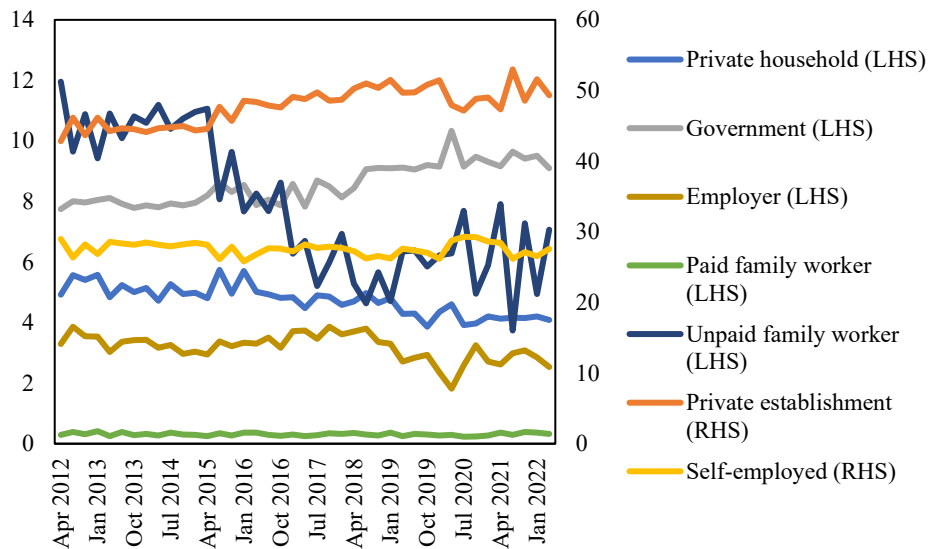
#### 4.4 Reallocation Across Classes of Work

In terms of class of work, there had been a decline in the share of employment in private establishments which was met by the increase in the share in employment in the government at the onset of the pandemic (Figure 16). Informality also increased in the same period as the employment share of the self-employed and unpaid family workers rose, indicating a deterioration in the quality of aggregate employment. Employment shares by class of work seem to have returned to their pre-pandemic levels more than a year into the pandemic, except for unpaid family work which remains relatively elevated.



Figure 17 shows the estimates of the  $R_t$  from April 2015 to April 2022 across classes of work. Looking at the aggregate estimate, we observe that, after peaking in April 2018, the  $R_t$  appeared to be mostly declining and dropped to its lowest level yet in April 2022. This indicates slower employment dynamics in terms of class of work. The lower reallocation seems to be more pronounced for men with the faster decline in the  $R_t$  over time. For women, spikes in the  $R_t$  that are comparable to that in April 2018 can be seen in July 2020 and April 2021, before tapering off at a reallocation level lower than that in April 2015.

**Figure 16. Employment shares by class of work (%)**



Note: LHS = left-hand scale. RHS = right-hand scale.  
 Source of data: Authors' estimates using several rounds of the Labor Force Survey.

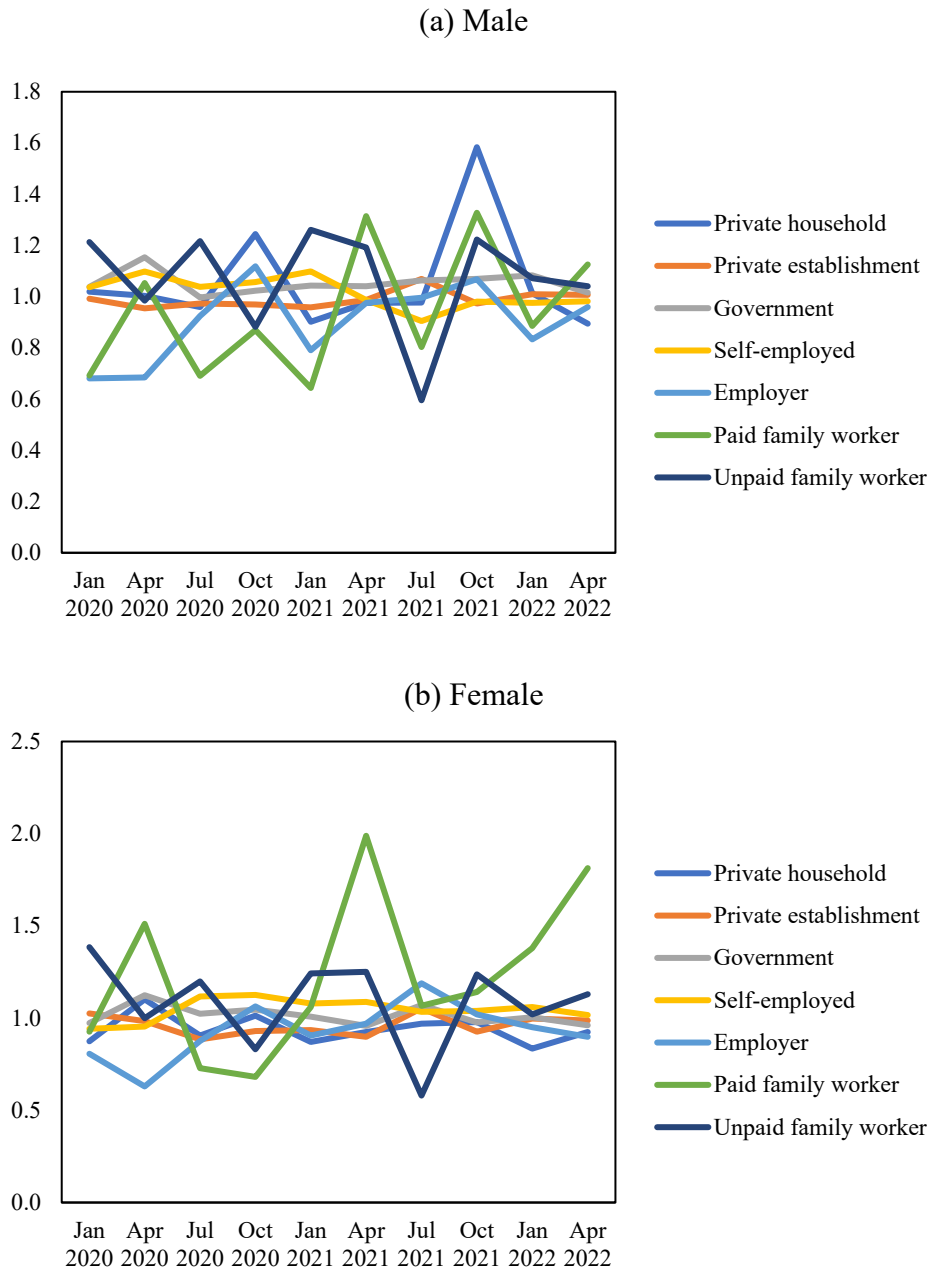
**Figure 17. Reallocation index—Class of work**



Source: Authors' estimates using several rounds of the Labor Force Survey.

From Figure 18, we see in Panel (a) that deviations from 2019 male employment shares were largely fluctuating for paid family workers, unpaid family workers, and employers. However, male employment shares for all classes of work appeared to be moving towards their 2019 levels by 2022. Although the same classes of work manifested fluctuating deviations in employment shares for women, there appeared a continuing uptick in the employment shares of paid and unpaid family workers.

**Figure 18. Change in employment shares by gender–Class of work**



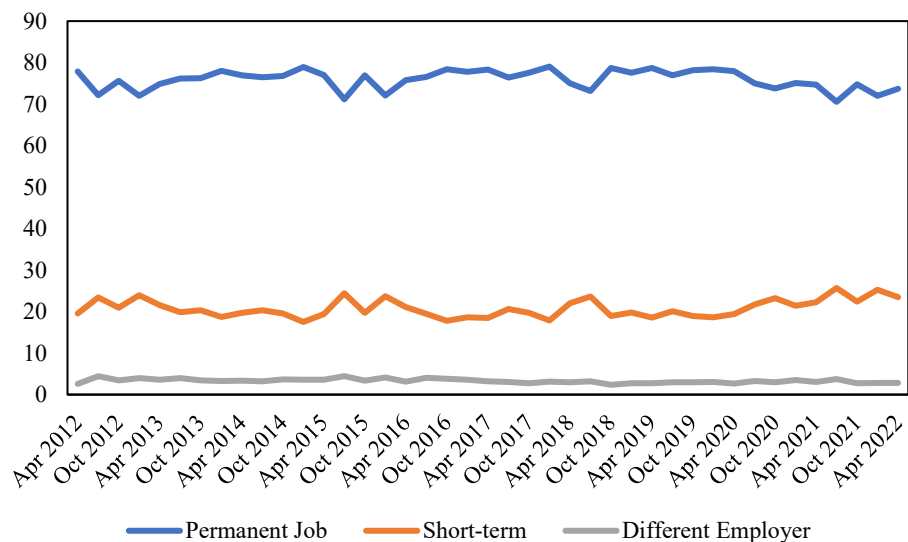
Note: Change in employment shares is calculated as the ratio between employment share in current quarter and in the same quarter in 2019.

Source: Authors' estimates using several rounds of the Labor Force Survey.

## 4.5 Reallocation Across Nature of Work

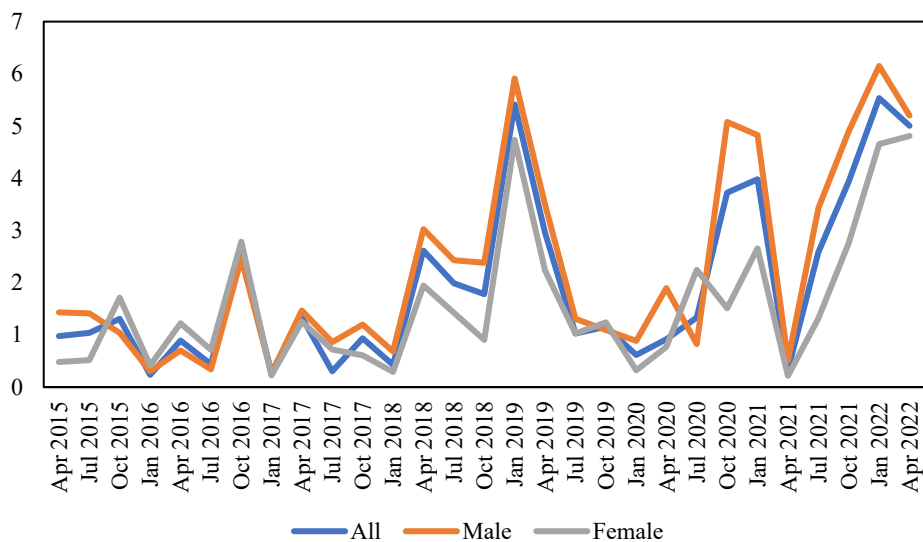
Examining the employment shares by nature of work provides a different picture from what we have seen so far (Figure 19). The share of permanent employment has been declining and the share of short-term employment increasing since the latter part of 2018, and this continued well into the recovery period over the pandemic. This is likely why, except for the fall in April 2021, the reallocation index spiked during the pandemic (Figure 20). For both men and women, the deviation of share of short-term employment from their 2019 levels continue to increase over the pandemic, while those of permanent employment and different employers had been converging towards their 2019 levels two years into the pandemic.

**Figure 19. Employment shares by nature of work (%)**



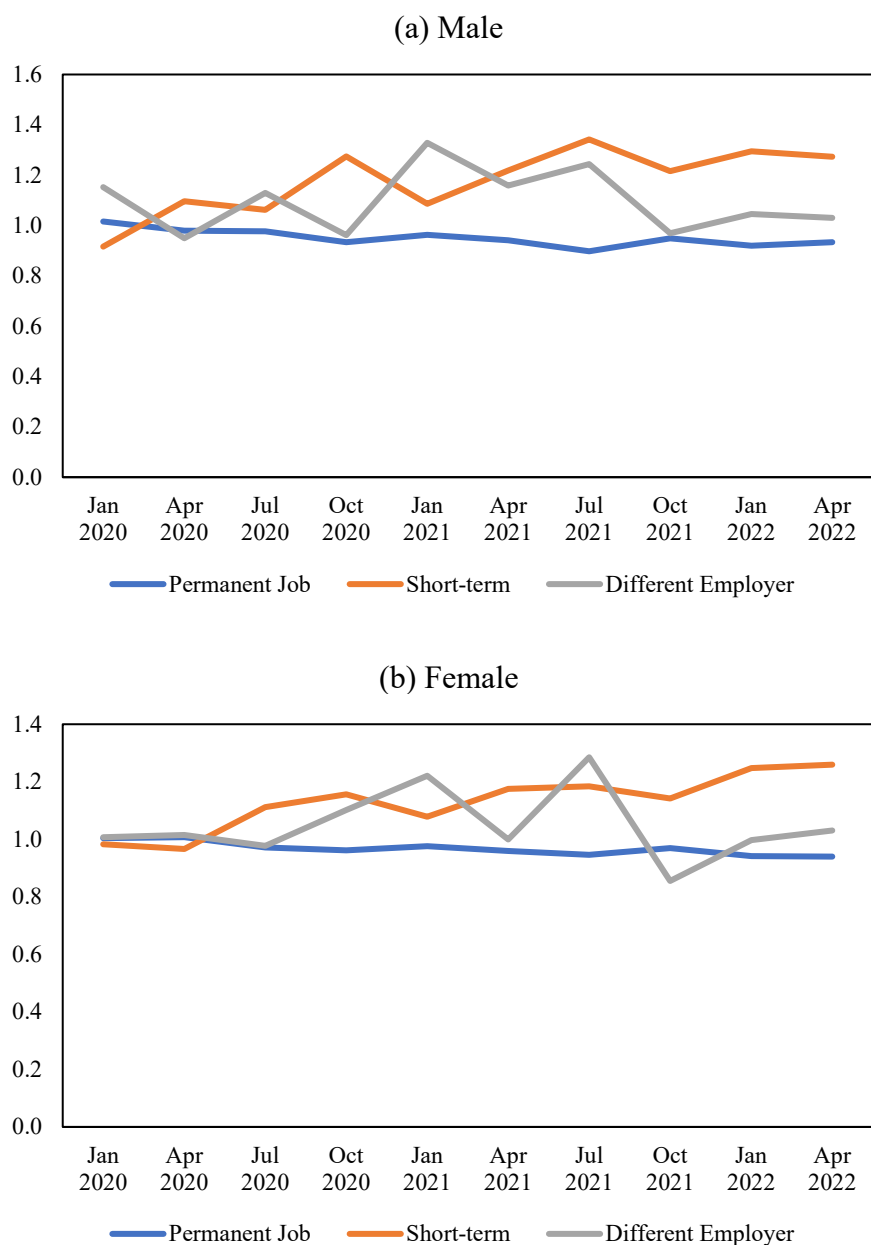
Source of data: Authors' estimates using several rounds of the Labor Force Survey.

**Figure 20. Reallocation index–Nature of work**



Source: Authors' estimates using several rounds of the Labor Force Survey.

**Figure 21. Change in employment shares by gender–Nature of work**



Note: Change in employment shares is calculated as the ratio between employment share in current quarter and in the same quarter in 2019.

Source: Authors' estimates using several rounds of the Labor Force Survey.

## 5. Conclusion

The unprecedented impact of the COVID-19 pandemic on employment raised questions about how much employment dynamics have changed as the labor market adjusts to shocks. We examine the changes in employment dynamics in the Philippines by performing a two-fold analysis on average hours of work and reallocations within the labor market. Our major findings are the following.

First, the change in average hours of work before the pandemic was mostly attributed to the extensive margin, but the change at the intensive margins became more apparent during the pandemic, even when the labor market had been showing moderate recovery. This contrasts the findings from developed countries where changes at the extensive margin were largely observed and changes at the intensive margin appeared to be muted at the onset of the pandemic. In previous literature, these differences are explained by the absence of a well-developed unemployment insurance system in developing countries like the Philippines. That is, people would rather keep their jobs and work fewer hours (or even zero hours) where they can still earn some income than lose their jobs where income flows would stop in the absence of an unemployment insurance. A notable exemption is the situation of the female old age bracket where the change in average hours of work consistently occurred at the extensive margin.

Second, contrary to what was found in developed countries, reallocations across sectors and occupations were relatively lower in the Philippines during the pandemic. This result implies that the Philippine labor market becomes less dynamic when faced with an economic crisis that is as large as that of the COVID-19 pandemic. Such implication is not surprising given our previous finding that the average hours of work of the employed adjusted by a larger degree relative to the employment rate. Nonetheless, higher reallocation across classes of work can be observed for women, although this is due to the rising employment shares of paid and unpaid family workers. Higher reallocation across nature of work also paints a grim picture as it is attributed to increasing short-term employment. Taking these findings together, it appears that there was lesser flexibility to move across occupations and sectors during the COVID-19 pandemic compared to the period where the Philippines was experiencing robust economic growth. Instead, the deterioration in the quality of employment seems to continue over the pandemic with increasing unpaid family work for women and short-term employment for both men and women.

One aspect that would be helpful for policymaking is to examine whether the drop in 2020 and slower recovery in 2021 in average hours of work is voluntary or not on the part of the individuals, as each situation would be handled differently. While more nuanced data is needed to be able to understand why people were working fewer hours compared to how it was before the COVID-19 pandemic, we can look at other labor market indicators to form some initial impression. Time-related underemployment rate climbed in the first two years of the pandemic, which means that a larger share of the employed want to have longer working hours. This suggests that, at least to a certain extent, the lower average hours of work are involuntary. For policy targeting purposes, it would be important to identify which groups of people are experiencing involuntary reduction in hours of work. For instance, de Dios and Dinglasan (2015) found a much higher poverty incidence in 2009 among the underemployed than among the unemployed and among those not in the labor force.

With limited social safety nets that protect worker income amid economic shocks, there appears little leeway for workers to adjust in the labor market. Thus, sufficient and timely support for workers should be delivered when faced with negative economic shocks. Moreover, further study into the role of wage adjustments in employment reallocation and the coping mechanisms of households would provide more evidence on how to provide social safety nets to the adversely affected individuals and households by economic crises.

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## Appendix 1: Policies on mitigating the impact of the COVID-19 impact to households and workers

The following are some of the policies that have been legislated to mitigate the impact of the COVID-19 pandemic on the country's economy and to provide social support to those who have been affected.

- **Republic Act 11469 (Bayanihan to Heal as One Act).** This law includes a provision that granted an emergency subsidy to approximately 18 million low-income households. This subsidy amounted to Php 5,000 to Php 8,000 per month for a duration of two months. Moreover, reallocation, reprogramming, and realignment of funds from the 2020 General Appropriations Act were permitted to effectively address and respond to the pandemic. These funds were channeled into programs aimed at providing social amelioration and facilitating the recovery of areas, sectors, and industries that were severely affected.

The law was in effect from March 24 to June 25, 2020, during which a total of Php 369.1 billion was allocated, and Php 357.9 billion was subsequently obligated and disbursed. These amounts were part of the Php 387.9 billion worth of funds allocated. Upon the expiration of Bayanihan I, further funds amounting to PHP 6.5 billion were allocated from the 2020 national budget for COVID-19 response. This addition brought the total amount of funds under Bayanihan I to Php 396.4 billion (DBM 2021 as cited by Reyes 2022).

- **Republic Act 11494 (Bayanihan to Recover as One Act) and its extension Republic Act 11519.** The provision of financial assistance continued, offering amounts ranging from Php 5,000 to Php 8,000 to low-income households affected by the pandemic, as well as to returning overseas Filipino workers and displaced workers. This support was extended until June 30, 2021. The law facilitated a total economic stimulus worth Php 165.5 billion.

Due to the laws passed during the pandemic, various government agencies extended support through social programs. Some of these are the following.

- ***Tulong Panghanapbuhay sa Ating Disadvantaged/Displaced Workers (TUPAD) Program.*** The Department of Labor and Employment (DOLE) extended temporary wage employment or emergency work opportunities to informal sector workers who were impacted by the pandemic. Eligible recipients participated in a four-hour daily disinfection and sanitation initiative for their residences and immediate surroundings, spanning ten days, and received compensation at the minimum wage level. The program was executed in collaboration with Local Government Units (LGUs), barangays, and local health offices. Beyond the daily earnings, laborers were furnished with personal accident insurance, personal protective gear, and a comprehensive cleaning kit (DOLE, 2020). A total of 939,209 workers/beneficiaries were served, as of 2021, and a total of Php 4.547 billion has been utilized (Reyes, 2022).

- **COVID-19 Adjustment Measures Program (CAMP).** DOLE provided a one-time monetary support of Php 5,000 to employees affected within private enterprises, including those in the tourism and education sectors (DOLE, 2020). An amount of Php 4.57 billion was allocated for this program, benefiting a total of 914,335 workers (Reyes, 2022).
- **CAMP *Abot Kamay ang Pagtulong* (AKAP) for Displaced OFWs.** DOLE extended financial aid amounting to Php 10,000 per person to overseas Filipino workers (OFWs) who were adversely affected during the pandemic. A total of 116,194 OFW beneficiaries have been served, with an expenditure of Php 1.168 billion (Reyes, 2022).
- **Employees' Compensation (EC) Program Benefits.** The Employees' Compensation Commission (ECC) under DOLE provided monetary support totaling Php 35.365 million to 3,527 individuals who contracted COVID-19 (DOLE, 2020).
- **COVID-19 Assistance to Restart Enterprises (CARES) 2 Program.** The CARES Program is a financing initiative designed to aid micro, small, and medium enterprises (MSMEs) in recovering from the adverse impacts of the pandemic, offering interest-free and collateral-free funding. Borrowing MSMEs are solely required to make a one-time service fee payment, capped at a maximum of 8 percent, for a loan term spanning four years (Small Business Corporation, 2021).
- **Livelihood Seeding Program-Negosyo sa Barangay (LSP-NSB).** With a designated fund amounting to Php 203 million, the initiative aims to offer a package comprising livelihood kits and business advisory support, ranging from Php 5,000 to Php 8,000, to assist MSMEs affected by both natural and human-induced disasters, including health crises stemming from epidemics and pandemics (Reyes, 2022).
- **Unemployment benefits for dislocated workers.** Administered through the Social Security System (SSS), the Unemployment Insurance or Involuntary Separation Benefit was provided to eligible workers who have experienced involuntary job separation (Reyes, 2022).
- **Social Assistance Program (SAP).** The recipients of SAP encompass the country's poorest 18 million families. They receive monetary aid from the government, ranging between Php 5,000 and Php 8,000, contingent upon the prevailing minimum wage in the beneficiary's area of residence (Reyes, 2022).