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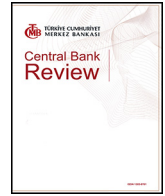
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Covid 19 and the Turkish labor market: Heterogeneous effects across demographic groups[☆]

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ABSTRACT

The aim of this paper is to detect the effects of the Covid-19 pandemic on several labor market indicators and to identify the heterogeneity of these effects across different demographic groups in the Turkish labor market. To this aim, we use the quarterly Turkish household labor force surveys which cover the period between 2005 and 2020. We find that pandemic decreased employment and labor force participation of almost all groups. The effect on women was more prominent in comparison with men. We also find heterogeneity with respect to age. Finally, our results show that the least educated were more negatively affected by the pandemic.

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1. Introduction

The Covid-19 pandemic, which started to spread around the world at the beginning of 2020, affected Turkey since March 2020. After the first case observed on March 11, various measures such as sectoral lockdowns, school closures, and curfews for specific age groups were taken in order to prevent the spread of the epidemic. In addition, worries of being infected caused a decline in consumption demand in some sectors, especially in services. Finally, the problems in the international supply chain due to the epidemic and the contraction in global demand caused a decline in industrial production. All these adverse effects were reflected in the economic activity and the gross domestic product (GDP) declined sharply in the second quarter of 2020. The slowdown of the economy and the social distancing measures during the epidemic process adversely affected the labor market as well; labor force participation and

employment rates declined dramatically.

The negative impact of the Covid-19 outbreak on economic activity was temporary. GDP recovered rapidly in the third quarter and continued to increase in the fourth quarter, and surpassed the pre-pandemic level. On the other hand, the recovery in the labor market was modest. In this paper, we analyze the effect of the Covid-19 pandemic on the Turkish labor market throughout 2020 using individual-level data from quarterly labor force surveys. We focus on the heterogeneity of the effects across different demographic groups with respect to gender, age, education, and parenthood. To fully capture the labor market effects, we analyze several indicators such as participation, employment (informal and formal), and unemployment.

Outbreaks may adversely affect the labor market via various channels. First, similar to all economic recessions, labor demand declines. Even without any restrictions, people voluntarily curtail economic activity due to fear of being infected (Aum et al., 2021). In addition, government-mandated lockdowns directly reduce production and employment. Hence, a decline in the employment rate and an increase in the unemployment rate can be expected. However, the labor supply may also decline since some individuals leave the labor market due to the illness or loss of their lives (World Bank, 2014). Moreover, the risk of being infected may trigger some of the

[☆] The views expressed here are of the authors and do not necessarily reflect those of the Central Bank of the Republic of Turkey.

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workforces to leave the labor market causing a decline in the labor force participation rate. Yu et al. (2020) show that in previous pandemics, labor force participation rates declined more in countries with higher cultural risk aversion. Coibion et al. (2020) find that the decline in labor force participation was larger and the increase in the unemployment rate was smaller during the first months of the Covid-19 pandemic compared to the historical experience in the US. Aum et al. (2021) show that employment losses due to the Covid-19 pandemic in Korea did not cause an increase in the unemployment rate due to the fall in labor force participation. They argue that job losers may be waiting for the end of the pandemic to search for a job or expecting to return to their previous jobs after the pandemic. In summary, estimating the labor market effects of a pandemic-led economic slowdown is more difficult compared to typical recessions.

Labor supply and demand effects of the Covid-19 outbreak may not be equally distributed along with the working-age population. Earlier literature acknowledges that the adverse effects of recessions on the labor market are not homogeneous across demographic groups. For example, Hoynes et al. (2012) find that male, young and under-educated workers suffered from the 2008 turmoil more strongly in the US. Moreover, similar differences across demographic groups are observed in the previous recessions. However, evidence from earlier studies may not be valid for the Covid-19 led recession due to heterogeneous effects of the pandemic on labor supply decisions, effects of lockdown mandates on employment of different demographic groups and industries.

There is a large and growing literature on the labor market effects of the Covid-19 pandemic mostly for the developed countries. In addition to studies estimating the total impact on the labor market, a considerable amount of studies focus on the heterogeneity of the effects. The effect of the pandemic on gender equality is one of the top issues in policy discussions. Many studies provide suggestive evidence that, unlike earlier recessions, the Covid-19 pandemic has a disproportionate impact on women's socioeconomic outcomes (Brodeur et al., 2021). In order to emphasize this peculiarity of the Covid-19 recession, the term "shecession" has been introduced in policy discussions.¹ Alon et al. (2020) list a relatively higher share of women in industries hit more in the pandemic and the increased childcare duties due to school and daycare closures as the main behind the shecession. Empirical evidence regarding the existence of a shecession during the Covid-19 pandemic is mixed. While some studies, such as Cortes and Forsythe (2020) for the US, Farré et al. (2020) for Spain, Alon et al. (2021) for a sample of developed countries find that women were hurt more in the labor market compared to men, others do not find any differential effect such as Milovanska-Farrington (2021) for the US and Hupkau and Petrongolo (2020) for the UK. Nevertheless, it can be safely argued that the Covid-19 pandemic is different from previous recessions since there is no evidence of men being disproportionately affected in the labor market, at least in developed countries.

One possible reason behind the differential effects of the Covid-19 pandemic across genders is the traditional division of household chores. Mothers are expected to be more affected by the school closure measures due to traditional childcare roles. Several studies test this hypothesis with different comparisons. Heggeness (2020) compares mothers in areas with early school closure measures with those in areas with no or delayed measures in the US. She finds that there is no immediate impact on labor market attachment, the likelihood of having a job but not working increases due to school

closures for mothers. Montenegro et al. (2020) compare mothers with fathers with young children and achieve similar results. Lofton et al. (2021) analyze the heterogeneity in the effect of parenthood for men and women in the US. They find that the fall in employment and labor force participation was much smaller across fathers compared to mothers and non-parent men and the recovery has been more pronounced for men and women without children. Adams-Prassl et al. (2020a) find that mothers were more likely to decide to be furloughed whereas no gender gap exists amongst childless workers in the UK.

The age might be another source of heterogeneity of the impacts of the Covid-19 pandemic. In a typical recession, young are expected to be hurt more since workers with tenure may keep their jobs and new entrants into the labor market are severely affected by the decline in the hiring rate (Hoynes et al., 2012). Several studies, such as Cortes and Forsythe (2020) and Lee et al. (2021) for the UK and Crossley et al. (2021) for the UK show that the negative labor market effects of the pandemic in the first months of the epidemic were more pronounced on youth. However, empirical results in the opposite direction also exist. Coibion et al. (2020) present a large increase in those who claim to be retired in the first stage of the pandemic in the US, making early retirement a major driver of the decline in labor force participation rate. Bui et al. (2020) compare the decline in the employment rates of older workers with younger cohorts in the US during the first months of the pandemic. In terms of percentage point declines, young workers seem to be affected more. However, this may be an artifact since the initial level of employment rate is small compared to young. Once this level-difference is controlled for, percentage decline across older workers is higher. They argue that higher mortality rates for older people drive these results. Older people may quit jobs or even if they brave the elevated risks, employers may be reluctant to hire older workers because of higher health risks. Finally, heterogeneity with respect to age is not necessarily linear. Hoehn-Velasco et al. (2021) find that youngest and oldest workers were more affected compared to middle-aged workers in Mexico. Lee and Cho (2016), who examined the MERS epidemic in Korea in 2015 reached similar conclusions. They also show that the negative impact for older workers was higher compared to young after the epidemic.

The effect of the Covid-19 outbreak has been found to be heterogeneous with respect to education as well. In line with the evidence on previous recessions, several studies, such as Cortes and Forsythe (2020) for the US and Adams-Prassl (2020b) for the US, UK and Germany find that less educated were disproportionately affected by the pandemic. On the other hand, Montenegro et al. (2020) find an inverse U-shaped pattern; higher educated workers could continue their jobs remotely and least educated workers were concentrated in essential industries where lockdown measures were not implemented.

There are a few studies on heterogeneous effects of the Covid-19 pandemic on Turkish labor market. These studies simulate possible effects of Covid-19 on job and income losses using data of pre-pandemic period, instead of estimating the effects of the pandemic using data of the pandemic period. Duman (2020) constructs a possibility to work index that accounts for industry level heterogeneity with respect to telecommuting opportunities and workplace closures and simulates possible effects of the social distancing measures on wage inequality. In a similar fashion, Demir Seker et al. (2020) develops an Employment Vulnerability Index to identify the sectors where the risk of job losses is higher. Aran et al. (2021) predicts the child-poverty impacts of Covid-19 pandemic due to fall in labor income considering that some types of jobs/sectors may be more vulnerable than others.

Our study is the first study to estimate the labor market effects of the Covid-19 pandemic using actual data of the pandemic period,

¹ See, for example, <https://www.theguardian.com/business/2021/jan/04/shecession-women-economy-c-nicole-mason-interview>.

to the best of our knowledge. Moreover, our study contributes to the literature on heterogeneous labor market impacts of Covid-19 with a large, developing economy case. Women, and especially mothers, are more adversely affected by the pandemic compared to men. In terms of age, we find a U-shaped pattern; the impact of the pandemic was hardest across young (aged 15–24) and old (55+). Finally, we observe that the effect diminishes with education level. The paper proceeds as follows. We present the basic facts on the Turkish labor market and the Covid-19 measures in Turkey in the next section. We present the econometric model and the data in sections 3 and 4, respectively. Section 5 provides a discussion of empirical results and finally, section 6 concludes.

2. Country context

The Turkish labor market has long been characterized by low but rising labor force participation and employment rates (Fig. 1). Although a striking number of jobs were created, the unemployment rate remained high due to the rising labor force participation rate and working-age population. The Turkish labor market was not in a favorable position at the onset of the pandemic; the employment rate fell and the positive trend in participation rate interrupted in 2020 leading to an increase in the unemployment rate. Sharp declines in employment and participation rates were observed after the pandemic whereas the unemployment rate stayed stable.

The low levels of participation and employment rates in Turkey mostly come from female inactivity. Despite the positive trend in recent years thanks to improvements in enrollment in education, social norms against working women and declining fertility rate, female labor force participation in Turkey is still very low (Aldan, 2020). At the onset of the pandemic, female labor force participation was around 34 percent (Fig. 2).

Another peculiarity of the Turkish labor market is the high level of informality. Despite the rapid decline in the last decade, the informality rate was around 34 percent before the pandemic. Informality was more prevalent across young and women (Fig. 3). In terms of sectors, informality was common among the employees in the agricultural sector. While the overall informality rate was 34.5 percent in 2019, informality rates for agriculture, industry, construction and services were 86.6, 20, 37.7 and 22.5, respectively.

After the first Covid-19 case was observed, the government started to implement several social distancing measures in the last weeks of March 2020. Schools and universities were closed and online education started, remote work was introduced both in the

public sector and private sector recreational activities were suspended. Restrictions on intercity travel and a curfew for older citizens were introduced. Moreover, services of restaurants were limited to takeaways, and flights from major European and middle eastern countries were canceled. As a result of the increase in the number of cases, additional restrictions were introduced in April 2020 including a curfew for weekends and suspension of all international flights.

In the summer, some of the measures, including restrictions on restaurants, intercity travel, and international flights and some of the recreational activities were relaxed. Schools gradually started face-to-face education on September 21, 2020. However, in November 2020, when the daily cases increased to around 30,000, face-to-face education was again suspended and some restrictions on service activities were reintroduced.

In order to reduce the impact of restrictions on the labor market, several support programs were introduced. First, the eligibility criteria and application of the short-term work allowance due to the reasons related to Covid-19 were eased on March 2020 and the benefit duration was extended to 15 months from 3 months. Second, layoffs were prohibited except for certain conditions, and instead, employees used unpaid leave and were paid a wage subsidy from the Unemployment Insurance Fund. All these measures targeted formal employees and informal workers, who do not enjoy any job security regulations, could not benefit from these subsidies. Hence, job losses were more prevalent across informal workers in the pandemic, and the informality rate declined substantially after the pandemic (Fig. 3).

3. Econometric model

In order to check the heterogeneity of the effect of the pandemic across different demographic groups, we estimate the following linear probability model with a full set of interaction terms of demographic indicators with other individual and aggregate level variables.

$$y_{it} = \theta_j \times D_j \times q_t + \gamma_j \times D_j \times year_t + \alpha_j \times D_j \times p_t + \beta_j \times D_j \times X_i + \epsilon_{it} \tag{1}$$

where y_{it} is the labor market outcome the individual i at time t . D_j is the binary indicator for demographic group based on gender, age, and education, which equals 1 if individual i is a member of demographic group j . The binary variable p_t takes the value of 1 for the pandemic, namely the second, third and fourth quarter of 2020 and the coefficient α gives the estimate of the effect of the

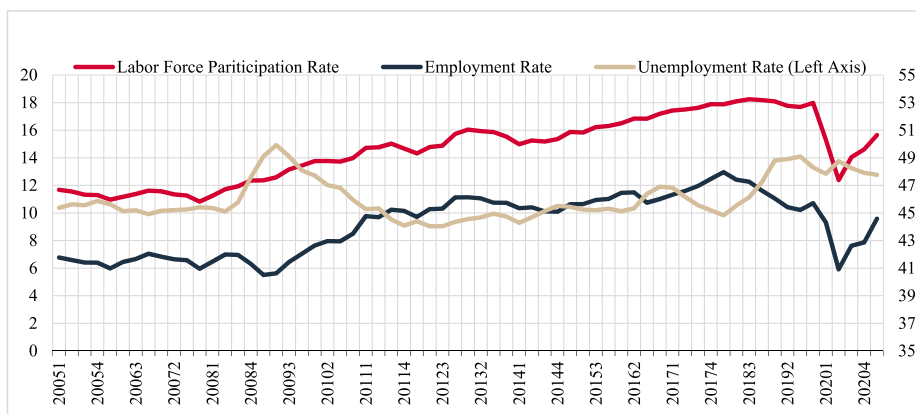


Fig. 1. Labor force participation, employment, and unemployment rates (%). Source: Turkish Labor Force Survey.

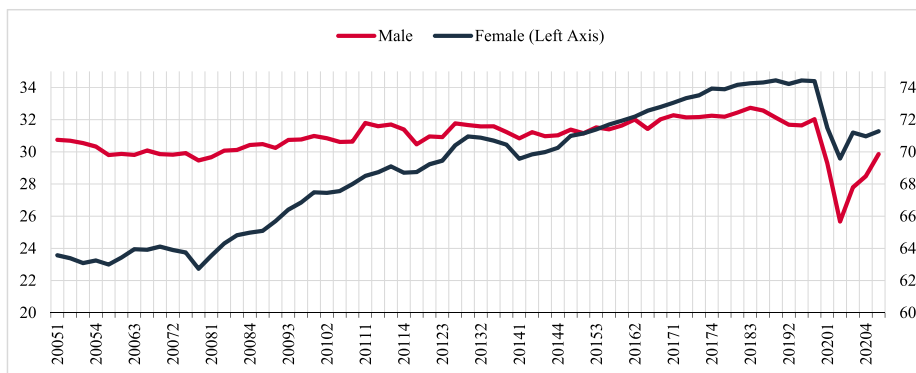


Fig. 2. Male and female labor force participation rates (%). Source: Turkish Labor Force Survey.

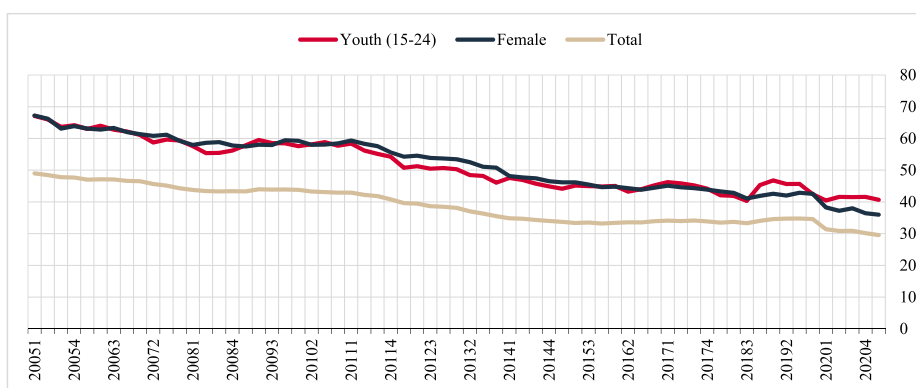


Fig. 3. Informality rate across age groups (%). Source: Turkish Labor Force Survey.

pandemic for each demographic group. We interact seasonal (q_t) and year dummies ($year_t$) with demographic indicators and allow for demographic group seasonal and time effects. Finally, X_i represents the set of control variables and ε_{it} represents the error term.

In our baseline regressions, we construct three mutually exclusive labor market outcomes: (i) employed (ii) unemployed (iii) out of labor force. Accordingly, we generate three separate binary indicators for these outcomes within the whole sample of individuals above 15. This indicates that a reduction in one of the groups must be compensated by an overall increase in the remaining two groups. Furthermore, we run separate regressions for formal and informal employment.

In order to see the evolution of the effects of the pandemic throughout 2020, we run three separate regressions where we compare labor market outcomes in specific quarters of the pandemic and pre-pandemic period

$$y_{it} = \theta_j \times D_j \times q_t + \gamma_j \times D_j \times year_t + \alpha_j \times D_j \times p_t^k + \beta_j \times D_j \times X_i + \varepsilon_{it} \quad k = 1, 2, 3 \tag{2}$$

where p_t^k denotes the k th quarter in the pandemic period, namely the second, third, and fourth quarters of 2020, respectively. In these regressions, we only include data for the pandemic period under consideration and exclude other pandemic periods.

Finally, we investigate the heterogeneity of pandemics with respect to parenthood. Since women are traditionally responsible for childcare, the effect of parenthood may differ between men and

women. To test this hypothesis, we run the regression below for men and women separately;

$$y_{it} = \theta_j \times q_t + \gamma_j \times year_t + \alpha_j \times child_i \times p_t + \beta_j \times X_i + \varepsilon_{it} \quad j = f, m \tag{3}$$

where $child_i$ is a dummy variable that equals 1 in the case of the presence of a child in the household. The coefficients α_j give the effect of the pandemic for parents and non-parents for women ($j = f$) and men ($j = m$), separately.

4. Data and descriptive analysis

In this study, we use the individual-level data from the quarterly household labor force surveys conducted by the Turkish Statistical Institute. The data is available from 2005 onwards and is representative of the working-age population (15+) using sample weights provided.

In the baseline regressions, we generate demographic groups based on gender, age, and education. We include age in the analysis by dividing the sample into 5 age groups; 15–24, 25–34, 35–44, 45–54, and 55+. Three groups are constructed to analyze heterogeneity with respect to education level; those who do not have a high school diploma, high school graduates, and college graduates. The variables that are not the focus of the heterogeneity regression (not in D_j) are included in the vector of control variables (X_i). Moreover, marital status, a binary variable that equals 1 for

married, is included in X_i in all regressions. In regressions where we analyze the heterogeneity along with parenthood (model 3), we generate a binary variable that equals 1 if there is a child aged less than 15 in the household. Unfortunately, the data does not provide the age of the children in the household.

Basic labor market characteristics of the sample are provided in Table 1. The gender gap is noteworthy; LFP and employment rate is less than half of men. Moreover, informality is more common and the unemployment rate is higher among women. Moreover, having a child is negatively correlated with women's activity in the labor market. Participation and employment rates follow a U-shape pattern across age groups and the decline in the oldest age group is noteworthy, which may be due to low statutory retirement age. Finally, LFP and employment rates increase and informality declines with education, as expected.

5. Empirical results

In this section, we present the estimated impact of the pandemic on labor market outcomes for various demographic groups separately. For the population above 15, we construct three binary variables for labor market status: (i) employed (ii) unemployed (iii) labor force participant. For each of these outcome variables, we analyze each demographic group separately to identify the most affected segments of the society. In this regard, we first examine the effect among the sample of men and women separately. Then, we switch to the analysis of heterogeneous effects across age groups. Finally, we divide the population into education levels and examine the impact of the pandemic across individuals from various educational backgrounds.

Table 2 below provides the estimation results with respect to gender. The coefficients, which provide the percentage point change in labor market indicators due to the pandemic in the working-age group, are given in the rows named "pandemic effect". Therefore, the coefficients of employment and unemployment add up to the coefficient of labor force participation. For example, the pandemic led to a fall of 3.25 percentage points in employment probability which was reflected in a 0.6 percentage point increase in unemployment probability and 2.64 percentage points decline in LFP. Moreover, the fall in employment almost came equally from formal (1.58 percentage points) and informal (1.66 percentage points) employment.

Although the coefficients or percentage point changes are useful for accounting purposes, they may be misleading in comparing demographic groups since they are proportional to pre-pandemic employment rates. For example, employment probability declined by 3.25 and 2.10 percentage points across the male and

female working-age population, respectively, suggesting that the effect of the pandemic was more severe among men. However, this is the result of the inactivity of women relative to men in the labor market in the pre-pandemic period (Fig. 2). In order to account for initial level differences, we base our comparisons on average value scaled effects or percent changes, obtained by dividing the percentage point changes to average levels in the pre-pandemic period.

Comparison based on average value scaled effects suggests that decline in employment among women was 8.32 percent of the average pre-pandemic employment rate, much larger than the decline among men (5.06 percent). The negative effect of the pandemic was larger on informal employees among both women and men. This is not surprising since informal employees did not benefit from the government measures to prevent employment and employment protection legislation does not apply to informal workers. On the other hand, a higher informality rate across women does not lead to the gender disparity in employment; the probability of formal employment also fell higher among women. One possible reason behind gender differences in employment possibility is that share of women in vulnerable industries, for example textile apparels as documented in Demir Seker et al. (2020), is higher. However, there is a sharp difference across genders in other labor market statuses as well; unemployment probability decreased among women despite a fall in employment thanks to the sharp decline in labor force participation. On the other hand, the pandemic caused a rise in unemployment across men since the decline in labor force participation did not compensate for the fall in employment. The traditional role of the main breadwinner may be one of the reasons behind this discrepancy in labor market status dynamics.

The results in Table 2 suggest that women were more severely affected by the pandemic in terms of employment and participation. One reason may be that school closures have a higher impact on women due to their traditional role in childcare. To test this hypothesis, we estimate the effect of the pandemic on men and women separately allowing heterogeneity with respect to parenthood (Table 3). The results suggest that employment and labor force participation declined across parents in the pandemic compared to non-parents. However, the difference was minimal for men; employment probability fell by 5.50 percent for men with children and 4.77 percent for men without children. On the other hand, the difference was large across women; 10 percent versus 6.7 percent fall in employment probability. Similar differences apply to labor force participation. A significant difference is also observed in unemployment dynamics. Men with children are more likely to be unemployed compared to men without children. One explanation

Table 1

Basic labor market indicators across demographic groups.

		Labor Force Participation Rate (%)	Employment Rate (%)	Informality Rate (%)	Unemployment Rate (%)
Gender and Parenthood	Male	71.0	63.7	33.3	10.3
	Without Children	61.2	54.0	36.1	11.7
	With Children	80.6	73.2	31.2	9.2
	Female	29.3	25.5	50.6	13.0
	Without Children	30.1	25.8	45.7	14.2
	With Children	28.6	25.2	55.3	11.8
Age Group	15–24	40.1	31.8	51.4	20.6
	25–34	66.5	58.5	26.0	12.1
	35–44	67.1	61.6	28.3	8.3
	45–54	54.6	50.3	42.1	7.8
	55+	22.9	21.8	73.5	4.9
Education Level	Less Than High School	42.7	38.3	53.8	10.2
	High School Degree	57.7	50.2	22.2	13.0
	College Degree	78.7	69.6	7.5	11.5

Note: Population weighted rates for the whole analysis period are presented. The number of observations is 6,054,165.

Table 2
Heterogeneous impact of the covid-19 on labor market status (gender).

		Employment	Formal Employment	Informal Employment	Unemployment	LFP
Men	Pandemic Effect	−0.0325*** (0.00918)	−0.0158*** (0.00419)	−0.0166*** (0.00570)	0.00610*** (0.00229)	−0.0264*** (0.00766)
	Average Value Scaled Effect	−0.0506	−0.0372	−0.0770	0.0847	−0.0369
Women	Pandemic Effect	−0.0210*** (0.00419)	−0.00842*** (0.00103)	−0.0128*** (0.00335)	−0.00434*** (0.00133)	−0.0256*** (0.00512)
	Average Value Scaled Effect	−0.0832	−0.0683	−0.0973	−0.1160	−0.0876

Note: Each column shows the effect of the pandemic period on the dependent variable given at the column title. In each regression, the dependent variable is defined within the working-age population. All estimations control for survey year, the quarter of the year, age, education, and marital status. Standard errors are shown in the parentheses, clustered at the quarter level. The number of observations is 6,054,165.

Table 3
Heterogeneous impact of the covid-19 on labor market status (parenthood).

		Employment	Formal Employment	Informal Employment	Unemployment	LFP
Men With No Children	Pandemic Effect	−0.0259*** (0.00828)	−0.0208*** (0.00309)	−0.00504 (0.00602)	0.00524*** (0.00197)	−0.0206*** (0.00753)
	Average Value Scaled Effect	−0.0477	−0.0603	−0.0255	0.0742	−0.0336
Men With Children	Pandemic Effect	−0.0404*** (0.0104)	−0.00978* (0.00575)	−0.0306*** (0.00572)	0.00719** (0.00301)	−0.0332*** (0.00797)
	Average Value Scaled Effect	−0.0550	−0.0195	−0.1315	0.0981	−0.0411
Women With No Children	Pandemic Effect	−0.0173*** (0.00401)	−0.00785*** (0.00101)	−0.00945** (0.00378)	−0.00341** (0.00162)	−0.0207*** (0.00500)
	Average Value Scaled Effect	−0.0670	−0.0569	−0.0786	−0.0807	−0.0689
Women With Children	Pandemic Effect	−0.0252*** (0.00487)	−0.00860*** (0.00192)	−0.0166*** (0.00309)	−0.00520*** (0.00110)	−0.0304*** (0.00553)
	Average Value Scaled Effect	−0.1002	−0.0786	−0.1169	−0.1580	−0.1069

Note: Each column shows the effect of the pandemic period on the dependent variable given at the column title. In each regression, the dependent variable is defined within the working-age population. All estimations control for survey year, a quarter of the year, age, education, and marital status. Standard errors are shown in the parentheses, clustered at the quarter level. The number of observations is 2,913,159 for the male sample and 3,141,006 for the female sample.

is that firms are reluctant to hire men with children during the pandemic due to a possible rise in childcare responsibilities. Comparison of the effects on informal employment, where the prohibition on firing does not apply, supports this labor demand hypothesis. The probability of working informally declined highest among men with children. On the other hand, parenthood was effective on the labor supply decisions of women. The unemployment probability of women with children declined more compared to women without children since they leave the labor market for childcare purposes.²

The results of the heterogeneity analysis with respect to age groups are provided in Table 4 below. In terms of employment and labor force participation, there is a clear U-curve pattern; young and older age groups are affected more by the pandemic. The effect on the young was highest; employment probability fell by 11.4 percent, which could not be fully compensated by the fall in labor

² We also ran regressions with number of children as independent variable. The results suggest that labor force participation and employment probabilities decline with number of children both for men and women but the effect is much larger for women. Unemployment increases with number of children for men and decreases for women, but the coefficients are not statistically significant (see Table A1 in the appendix).

force participation, leading to a rise in unemployment. The perverse effect on the young was much more pronounced in formal employment suggesting that firms are reluctant junior workers due to uncertainty in the labor market. Another possible explanation is that younger cohorts are less frequent among teleworkable jobs (Duman, 2020). On the other hand, the decline in employment among older workers, the other most affected group, was more pronounced in informal employment. Health concerns might have reduced both labor demand and supply for this group. Furthermore, low statutory retirement age might have amplified the decrease in informal employment. Those, who are retired but still work informally may have left the labor market.

Finally, we provide the estimation results with respect to education. There is a clear pattern in employment and participation; as the education level rises the negative effect of the pandemic declines (Table 5). One reason behind this result may be that less-educated workers are usually employed informally and cannot benefit from the short-work working allowance and prohibition on firing. However, a similar pattern is also observed in formal employment suggesting that higher informality among less-educated is not merely responsible for this pattern.

We now turn to the estimation results of equation (2) and analyze the heterogeneity in the evolution of the pandemic effect

Table 4
Heterogeneous impact of the covid-19 on labor market status (age).

		Employment	Formal Employment	Informal Employment	Unemployment	LFP
15-24	Pandemic Effect	−0.0365*** (0.00893)	−0.0284*** (0.00460)	−0.00812* (0.00455)	0.00418* (0.00227)	−0.0324*** (0.00945)
	Average Value Scaled Effect	−0.1140	−0.1847	−0.0488	0.0514	−0.0807
25-34	Pandemic Effect	−0.0255*** (0.00675)	−0.0140*** (0.00301)	−0.0114** (0.00463)	−0.000789 (0.00183)	−0.0262*** (0.00644)
	Average Value Scaled Effect	−0.0435	−0.0325	−0.0732	−0.0100	−0.0394
35-44	Pandemic Effect	−0.0254*** (0.00795)	−0.00917*** (0.00338)	−0.0162*** (0.00500)	0.000289 (0.00222)	−0.0251*** (0.00659)
	Average Value Scaled Effect	−0.0413	−0.0210	−0.0909	0.0053	−0.0374
45-54	Pandemic Effect	−0.0302*** (0.00814)	−0.00629*** (0.00225)	−0.0239*** (0.00677)	0.000953 (0.00187)	−0.0292*** (0.00712)
	Average Value Scaled Effect	−0.0602	−0.0220	−0.1110	0.0231	−0.0538
55+	Pandemic Effect	−0.0170*** (0.00331)	−0.00246** (0.00103)	−0.0145*** (0.00351)	−0.000823 (0.000860)	−0.0178*** (0.00405)
	Average Value Scaled Effect	−0.0778	−0.0432	−0.0897	−0.0741	−0.0775

Note: Each column shows the effect of the pandemic period on the dependent variable given at the column title. In each regression, the dependent variable is defined within the working-age population. All estimations control for survey year, the quarter of the year, age, education, and marital status. Standard errors are shown in the parentheses, clustered at the quarter. The number of observations is 6,054,165.

Table 5
Heterogeneous impact of the covid-19 on labor market status (education).

		Employment	Formal Employment	Informal Employment	Unemployment	LFP
Less Than High School	Pandemic Effect	−0.0273*** (0.00780)	−0.00879*** (0.00300)	−0.0185*** (0.00539)	0.000179 (0.00181)	−0.0272*** (0.00673)
	Average Value Scaled Effect	−0.0708	−0.0498	−0.0885	0.0041	−0.0634
High School Degree	Pandemic Effect	−0.0216*** (0.00648)	−0.0123*** (0.00421)	−0.00930*** (0.00292)	−0.000887 (0.00236)	−0.0225*** (0.00689)
	Average Value Scaled Effect	−0.0428	−0.0314	−0.0826	−0.0119	−0.0388
College Degree	Pandemic Effect	−0.0164*** (0.00428)	−0.0139***	−0.00259	0.000667 (0.00240)	−0.0157*** (0.00436)
	Average Value Scaled Effect	−0.0235	−0.0214	−0.0501	0.0073	−0.0200

Note: Each column shows the effect of the pandemic period on the dependent variable given at the column title. In each regression, the dependent variable is defined within the working-age population. All estimations control for survey year, the quarter of the year, age, education, and marital status. Standard errors are shown in the parentheses, clustered at the quarter. The number of observations is 6,054,165.

over time. Table 6 presents the estimation results scaled with average values for LFP, employment, and unemployment. For each dependent variable, columns 1–3 provide the effects in the first, second and third quarters of the pandemic, namely second, third and fourth quarters of 2020, respectively. The results suggest a significant heterogeneity in the evolution of the effects as well. The negative effect of the pandemic declined throughout the pandemic for men in terms of LFP, employment, and unemployment. On the other hand, the effect on women was non-linear; LFP, employment, and unemployment probability first declined and then increased throughout the pandemic. The reason behind this non-linearity

might be the school closing measures in the first and third quarters of the pandemic. The results regarding parenthood support this idea; non-linearity comes from women with children. Regarding age, we see a fast decline in LFP and employment probability among the young in the second quarter of the pandemic, which continued at a slower pace in the third quarter. The improvement in employment was not enough to compensate for the improvement in LFP in the second quarter of the pandemic, causing a rise in unemployment. For older age groups (aged 45+) we see a non-linear pattern similar to women; the negative effect on LFP and employment first declined, then increased. One explanation might

Table 6
Heterogeneity in the evolution of pandemic effects.

		LFP			Employment			Unemployment		
		1	2	3	1	2	3	1	2	3
Gender	Men	-0.065***	-0.024***	-0.022***	-0.087***	-0.037***	-0.028***	0.133***	0.093***	0.028
	Women	-0.13***	-0.057***	-0.076***	-0.123***	-0.06***	-0.068***	-0.177***	-0.036**	-0.135***
Age Group	15–24	-0.14***	-0.061***	-0.042***	-0.181***	-0.102***	-0.06***	0.022	0.1***	0.032
	25–34	-0.064***	-0.026***	-0.028***	-0.071***	-0.033***	-0.026***	-0.009	0.023	-0.044*
	35–44	-0.061***	-0.021***	-0.03***	-0.073***	-0.024***	-0.026***	0.073***	0.021	-0.078**
	45–54	-0.085***	-0.028***	-0.049***	-0.101***	-0.033***	-0.047***	0.105***	0.035	-0.07**
	55+	-0.121***	-0.047***	-0.066***	-0.115***	-0.054***	-0.064***	-0.236***	0.094***	-0.082**
Education Level	Less than High School	-0.102***	-0.037***	-0.05***	-0.121***	-0.045***	-0.046***	0.069***	0.028	-0.086***
	High School	-0.07***	-0.024***	-0.024***	-0.075***	-0.036***	-0.019***	-0.037***	0.057***	-0.056***
	College	-0.034***	-0.012***	-0.015***	-0.038***	-0.011***	-0.023***	-0.008	-0.02	0.048
Parenthood	Men without children	-0.066***	-0.021***	-0.015***	-0.086***	-0.036***	-0.021***	0.094***	0.097***	0.033
	Men with children	-0.066***	-0.027***	-0.03***	-0.091***	-0.039***	-0.035***	0.177***	0.092***	0.025
	Women without children	-0.11***	-0.048***	-0.05***	-0.103***	-0.056***	-0.043***	-0.154***	0.004	-0.093***
	Women with children	-0.149***	-0.066***	-0.105***	-0.143***	-0.063***	-0.095***	-0.197***	-0.088***	-0.189***

Note: For each dependent variable, columns 1–3 provide the effects in the first, second and third quarters of the pandemic. In each regression, the dependent variable is defined within the working-age population. All estimations control for survey year, a quarter of the year, age, education, and marital status. Standard errors are shown in the parentheses, clustered at the quarter. The number of observations is 5,820,006 for the first, 5,818,392 for the second, and 5,817,831 for the third pandemic quarter.

be that increase in the number of Covid-19 cases caused triggered health concerns in these groups. Finally, the negative effect on LFP and employment for less-educated declined fast and converged to better high school and college graduates.

6. Conclusion

The Covid-19 pandemic affected the global economy and Turkey was no exception. Employment and labor force participation rates fell sharply simultaneously with GDP. Although GDP reached its pre-pandemic level in just one quarter, the improvement in labor market outcomes was slower. Pandemic itself and social distancing measures against the pandemic had also perverse effects on the labor market. Moreover, these perverse effects were not homogeneous across the population. In this paper, we analyzed this demographic heterogeneity in the negative effects of the pandemic.

Our results confirm earlier findings that the Covid-19 pandemic can be named as a “shcession”. Labor force participation and employment rates of women declined more compared to men. On the other hand, the unemployment rate did not fall as opposed to men suggesting that the pandemic changed the labor supply decisions of women significantly. A further investigation with respect to parenthood supports this argument. Labor force participation and employment of women with children declined, more simultaneously with a higher decline in the unemployment rate. On the other hand, the results for informal employment, where employment protection regulations do not apply, suggest that labor

demand for parents also decreased. Informal employment across men with children decreased substantially whereas no significant effect was observed for men with no child.

Our results suggest that the pandemic affected the labor market status of the youngest and oldest the most. Generally, young are found to be disproportionately affected by the fluctuations in the economy and our results suggest that the recent pandemic is not an exception. There is substantial literature suggesting that weak labor market conditions in early career life might have negative long-run effects. To avoid such a risk of the lost generation, policies aiming at increasing the employability of the young should be implemented. For the other most affected group, the oldest, health concerns seem to decreased labor supply and demand. Some older workers, who are already retired, might have left the labor market. In that case, a temporary reduction in the labor force participation rate might be expected, weakening pressures on the unemployment rate. Finally, we find that less-educated is another disadvantaged group in the pandemic. In the long-run, this group may remain disadvantaged in case of a permanent shift in the occupational composition of the labor market after the pandemic. Strengthening public employment and training services is crucial for them to adjust to new labor market conditions.

Appendix. Regression Results with Number of Children as Independent Variable

Table A1
Heterogenous impact of the covid-19 on labor market status (number of children)

		Employment	Formal Employment	Informal Employment	Unemployment	LFP
Men	Pandemic Effect*number of children	-0.0100*** (0.00310)	0.00445 (0.00282)	-0.0145*** (0.00182)	0.000843 (0.00121)	-0.00916*** (0.00218)
	Average Value Scaled Effect	-0.0156	0.0105	-0.0672	0.0117	-0.0129
Women	Pandemic Effect*number of children	-0.00721*** (0.00215)	-0.00290*** (0.000716)	-0.00432** (0.00179)	-0.000960 (0.000704)	-0.00817*** (0.00259)
	Average Value Scaled Effect	-0.0283	-0.0235	-0.0329	-0.0257	-0.0280

Note: Each column shows the effect of the pandemic period on the dependent variable given at the column title. In each regression, the dependent variable is defined within the working-age population. All estimations control for survey year, a quarter of the year, age, education, and marital status. Standard errors are shown in the parentheses, clustered at the quarter level. The number of observations is 2,913,159 for the male sample and 3,141,006 for the female sample.

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