Has the COVID-19 Recession been Harder on Women? Evidence from Employment and Time Use for Men, Women, and Children in Mexico

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December 2020

Abstract

This study examines changes in labor supply, income, and time allocation during the COVID-19 pandemic in Mexico. Using panel data from Mexico's National Employment and Occupation Survey, we follow individuals before and after the onset of the pandemic. We show that the resulting recession had severe negative consequences. Individuals lost one-third of their income, and almost 20 percent of individuals experienced a reduction in employment. Contrary to work in other contexts, we find little evidence that women and men were differentially affected. Men experienced slightly higher employment and income losses than women in the initial month of the pandemic, but these measures have rebounded at a faster rate for men relative to women. Men increased their contributions to household production, while neither men nor women increased their time spent with children despite widespread school closures. Children may have been particularly harmed by the pandemic, as time spent on schoolwork declined by more than 50 percent.

Keywords: Women; Children; COVID-19; Mexico; Labor Supply; Gender; Recession.
JEL: J12, J13, J16, J18, O12.

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1 Introduction

The economic consequences of the COVID-19 pandemic have been severe. In addition to death and illness, households have been burdened by shuttered economies that have resulted in a dramatic reduction in economic activity. Unlike previous recessions, the COVID-19 pandemic has been uniquely devastating to women (Alon et al., 2020). Women tend to work in sectors that are more adversely affected by the pandemic, and additional childcare responsibilities due to school closures have disproportionately fallen on mothers relative to fathers (Alon et al., 2020; Heggeness, 2020). However, much of the literature focuses exclusively on high-income countries rather than the world at large.[1] Middle and low-income countries face different constraints and more limited opportunities for remote work (Dingel and Neiman, 2020). Further, programs designed to alleviate the pandemic's economic harm, such as income support, vary greatly across contexts (Hale et al., 2020).

We examine the economic consequences of the COVID-19 pandemic in Mexico. The pandemic has been particularly harmful to economic activity in Mexico. GDP is estimated to have declined by 9% in aggregate and formal employment by 5% (IMSS, 2020; Flores, 2020; Silverio-Murillo et al., 2020). Despite the severity of the recession, the Mexican government has offered no new public policies to aid affected groups, unlike their counterparts in high-income countries (von Gaudecker et al., 2020) and similar Latin American countries (Hale et al., 2020). Moreover, compared to high-income countries, Mexico has fewer remote work opportunities and weaker public support systems. For these reasons, we expect the pandemic to operate differently in Mexico than in other contexts.

Using panel data from Mexico's National Employment and Occupation Survey (*Encuesta Nacional de Ocupación y Empleo* or ENOE), we measure changes in employment, income, and time use during the COVID-19 recession. The individual-level panel allows us to observe labor force participation and income before and after the onset of the pandemic for the same individuals. There are several benefits of this data in addition to the panel structure. First, the ENOE records both formal and informal work, which is essential in a setting such as Mexico, where the majority of the jobs are informal (Alvarez and Ruane, 2019).[2] Second, in addition to labor supply, the ENOE provides informa-

[1] Other related work in high-income countries includes (Aguiar et al., 2013; Alon et al., 2020; Czymara et al., 2020; Bartik et al., 2020; Cajner et al., 2020; Farré et al., 2020; Heggeness, 2020).

[2] In Mexico, a firm is considered formal based on accounting practices, which can be narrowed down to filing incorporation to Mexico's public registration authority and paying taxes to both federal and local governments. On the labor side, formal employment is defined as contributing to Mexico's social security system, including having access to health insurance and participating in the pension system. A unique characteristic of informality in Mexico is that formal firms can have informal workers on their payroll at the expense of being sanctioned or losing efficiency from hiring informal workers. In fact, 22% of all workers are informal workers hired by formal firms (Alvarez and Ruane, 2019).

tion on time use within the household, including time spent caring for others and time allocated towards household production. Third, the ENOE includes measures for school enrollment and time allocation for children. Using children's time allocation, we can determine how the school closures affected schoolwork during the pandemic. This will allow us to better understand how households responded to lost in-person schooling.

We use two primary econometric specifications throughout our analysis. First, we use a before and after estimation strategy, where we follow the same individuals through the COVID-19 recession. Then, we use an event-study design to track the effects in each month of the pandemic (April, May, June). In both specifications, and across all individuals, the COVID-19 pandemic sharply reduced employment and income. The employment probability dropped sharply by 0.20 in April, and hours spent working declined by 13 hours per week. Both employment and hours worked started to rise back to original levels by June but were still far below their baseline levels. Income also declined substantially during the pandemic. Monthly income fell by more than 1,300 pesos, representing more than one-third of income.Our results suggest that the effect of the pandemic differed across men and women. Among men, the probability of employment declined by 0.215, compared to a 0.175 decline for women. For informal work, the probability of employment declined similarly for men and women. For formal employment, men's likelihood of job loss was higher than women's (0.050 v. 0.047). This difference partially reflects men's higher hours worked from before the recession.

In response to lower employment outside the household, men reallocated their time towards household production (an increase of 1.2 hours), but not towards children. Women did not change their time use across household production or time caring for others (including children). We find similar allocations of time use post-pandemic in the subset of households with children and for married and unmarried individuals. These results suggest that women did not take on the burden of household work or childcare during the pandemic.

We then show the within-household burden on women, where the findings are consistent with our overall results. We examine the relative contributions to income, hours worked, and household production across men and women within the same household. In past recessions, women compensated for their husbands' job loss and income loss by increasing their own labor supply. Given the uniqueness of the COVID-19 pandemic, this insurance mechanism may not apply. Our results show that the relative contribution of women's income and labor supply is similar before and after the pandemic.[3] For measures of within-household time use, men contribute more to household production than before the pandemic. There is no shift in the household time spent caring for others (including children). These within-household findings indicate that women did not dis-

[3]When we include zero earners, women's contribution increases relative to men for both hours worked and income, due to men's wages falling to zero.

proportionately take on household work or childcare during the pandemic. Instead, the significant change within-household is that men take on more household production.

We conclude by considering the effects on children during the pandemic. Our analysis of adult time use demonstrated that neither men nor women shifted towards childcare. The lack of change in adults' time towards children suggests that children may have responded to school closures by spending less time on schoolwork. To test how children's time use changed after the pandemic, we select a sample of individuals who are ages 6 to 16.

During the pandemic, children did not change their school enrollment, but they did spend 18 hours less per week on schoolwork. Hours spent on schooling declined by more than 50% from the pre-pandemic mean. Given that parents also did not shift their time towards children, Mexican parents do not appear to compensate for the lost schooling at home. Instead, based on the ENOE survey, children's reported time on school activities declined substantially. However, we are unable to observe how children reallocated their time. As Mexico's public education transitioned to television during the pandemic, children may have shifted their time use from school to education programming (Córdoba and Montes, 2020; Rivers and Gallón, 2020). We cannot differentiate types of school-time or television time in our data.

This study contributes to the literature in two major ways. First, this study demonstrates how the pandemic affects men and women in a middle-income setting. The majority of papers that have examined the gendered impacts of the recession have studied high-income countries (Aguiar et al., 2013; Alon et al., 2020; Czymara et al., 2020; Leukhina and Yu, 2020; von Gaudecker et al., 2020; Bartik et al., 2020; Cajner et al., 2020; Farré et al., 2020; Heggeness, 2020). Contrary to the findings in other settings, we find no disproportionate adverse effect on women. Our results are similar to findings in the Netherlands in Meekes et al. (2020) (on average). In our context, employment declined by comparable amounts for both men and women, and income and hours worked declined by more for men than women. Our findings also show that men spent more time on household production after the pandemic, and women spent less (within the household). This finding is also distinct from time use results in the United States, where both men and women increased their household production (Leukhina and Yu, 2020). Our findings highlight that results from high-income countries are not universal.

We hypothesize that the pandemic's economic consequences differed in Mexico relative to other contexts due to the unique labor market. The principal differences between Mexico and high-income countries are the lower labor supply of women, the informal sector's relative importance, and the comparatively modest-sized service sector. First, the informal sector faces less oversight than the formal sector and may be impacted differently during downturns. In particular, regulation of the formal sector in Mexico makes

it difficult to lay off workers. As a consequence, many jobs concentrated in the informal sector (Levy, 2010; Busso et al., 2012). Second, labor supply is low in Mexico (Novta and Wong, 2017; Bustelo et al., 2019), with married women, in particular, forgoing market work (Hoehn-Velasco and Penglase, 2019). The lower labor supply for married women in Mexico suggests that households with children may be more able to respond to school closures than the United States. Third, the service sector is smaller in Mexico relative to high-income countries, (Agency, 2017), and individuals may have fewer opportunities for remote work (Dingel and Neiman, 2020).

Our second contribution, is this study is one of the few papers to consider the labor supply effects of COVID-19 outside of high-income countries. Another related paper, Silverio-Murillo et al. (2020) compares the Great Recession to the pandemic recession in Mexico, but this study focused on aggregate effects and only used data from the formal labor market. One of the advantages of the present study is the panel structure of the data; we observe the same households over time, which accounts for time-invariant unobservable characteristics. The ENOE also includes measures of informal employment and time use within the household. In another related study focusing on labor demand in Mexico, Campos-Vazquez et al. (2020) examines website job vacancies and demonstrates that jobs and wages dropped in April, but then job vacancies returned to pre-pandemic levels in May.

The remainder of this paper is organized as follows. Section 2 reviews the existing literature on the relationship between the COVID-19 recession and labor markets. Section 3 discusses the Mexican context. Section 4 describes the household survey data used throughout the analysis. Section 5 outlines the empirical strategy. Section 6 presents the main results. Section 7 concludes.

2 Related Literature

This study relates to several different strands of research. First, our study contributes to past work on how recessions affect men and women differently. Second, our paper contributes to recent work on the economic consequences of the COVID-19 pandemic.

The Great Recession was notable for the disproportionate adverse effect it had on male employment (Bargain and Martinoty, 2019). The COVID-19 recession has been different (Alon et al., 2020). Because women work in the service sector, which has been particularly harmed by the recession, their employment losses have been more severe. Moreover, school closures have resulted in an increased need for childcare. These patterns have been found in several countries, including the United States (Cajner et al., 2020) and Spain (Farré et al., 2020). These patterns are, however, not universal, as Meekes et al. (2020) finds little evidence that the pandemic more adversely affected women (on

average) in the Netherlands.

Mothers, in particular, have been harmed by the new pandemic economy. Heggeness (2020) shows that women with children in early-pandemic closure states in the United States experienced a much larger decline in employment relative to other individuals. These results suggest that the childcare burden may be focused on mothers rather than women in general. Similarly, in Germany Czymara et al. (2020) finds that women worried more about childcare than men during the pandemic, indicating that mothers may be faced with a disproportionate brunt of the childcare responsibilities. Outside of childcare, Leukhina and Yu (2020) finds that household production increased during the COVID-19 pandemic. However, despite the literature's speculation regarding the disproportionate burden on women with children, Leukhina and Yu (2020) finds similar increases in home production for married men and women. They find hours in household work increased by 1.7 hours per week (and a 6% reduction in hours in market work).

The pandemic recession has not affected all workers equally. Aside from gender, there is heterogeneity in the consequences of the pandemic by wage level. Cajner et al. (2020) finds greater employment declines among lower-wage workers. In particular, Cajner et al. (2020) estimates that 35 percent of all workers in the bottom quintile of the wage distribution lost their employment, at least temporarily. In comparison, only nine percent of high-income workers in the top quintile lost their jobs. One reason to expect women to be disproportionately harmed by this recession is that they are more likely to be employed in low-wage work.

This study adds to the above literature by documenting the individual-level effects of the COVID-19 pandemic on men versus women in a middle-income context. We further document the within-household effects of the pandemic. We compare the relative changes in income, wages, and time use for men relative to women in the same household, before and after the recession began. This exercise adds to our understanding of how childcare, household production, and labor supply is distributed within the same family during a recession. Further, unlike much of the existing literature, we are one of the first papers to consider a middle-income setting.

Our study also allows us to better understand why employment declined in response to the pandemic. Individuals may lose their job involuntarily due to decreased labor demand. Alternatively, individuals may wish to exit the labor force due to the health risk of working during a pandemic, or due to greater childcare needs. Finally, employment may decline due to government-mandated lockdowns. While we cannot empirically distinguish between these explanations, our study of time use within the household provides evidence over whether childcare influences employment decline. Our study, therefore, adds to recent work on how COVID-19 has affected economic activity. Important papers in this literature include Aum et al. (2020), who find that at most, half of the job losses

are attributable to lockdowns. Chetty et al. (2020) focuses on consumer concerns of infection and finds that that is essential in understanding the economic consequences of COVID-19. Our results suggest that school closures are not a major driver of employment declines, as time spent with children largely remained unchanged in Mexico.

3 The Mexican Context

Public Policies During the COVID-19 Pandemic Unlike many countries in Latin America and Europe, the Mexican government did not introduce new safety nets during the COVID-19 pandemic (Hale et al., 2020). Peru and Uruguay (March 16th and 18th, respectively) were quick to pass income support legislation, with Argentina, Bolivia, and Paraguay following (March 23rd, 31st, and 31st, respectively). Then by April, Ecuador, Chile, Honduras, Colombia, and Guatemala (April 1st, 2nd, 3rd, 7th,21st) had also passed income support policies.

Instead, the Mexican government introduced two mitigation policies, neither of which involved any monetary transfer (Lustig et al., 2020). First, individuals could receive an advanced two-month payment from the non-contributory pension system. Second, credits were given to small and medium-sized enterprises in the formal and informal sectors. For the formal sector, these credits were capped at 25,000 MXN (1,100 USD) in total, with a maturity of three years, at a 6.5% annual interest rate. México Evalúa (2020) suggests that the advanced payment is equivalent to 0.2% of the GDP and the credits to 0.1% of the GDP.

Outside of direct support to households and businesses, the Central Bank (Banco de México) also took action to mitigate economic exposure. The Central Bank added bond swaps and loosened rules for minimum deposits among commercial banks. Campos-Vazquez et al. (2020) suggests that the Central Bank's policies provided liquidity to the market equivalent to 3.3% of the GDP. In addition, the Central Bank granted regulatory flexibility to commercial banks, which allowed banks to give payment extensions to their customers on mortgages, credit cards and commercial loans, waving interest rates and fees for four months, beginning in April of 2020. Despite these measures, Mexico's response has been fairly limited in comparison to other nations. This inability to act left households without government support during a turbulent time. As a result, individuals may have been less willing to leave the labor force during the pandemic relative to similar countries.

Unique Features of Mexico's Labor Markets The Mexican labor market differs from the labor markets in other countries in several important ways. First, employment in Mexico is heavily concentrated in the informal sector relative to salaried work in the

formal sector (Levy, 2010; Busso et al., 2012). Mexican laws regulating salaried and non-salaried workers are often constraining, and this regulation may push jobs into the informal sector (Alvarez and Ruane, 2019). In the formal sector, workers have protections against layoffs and firings, with firms facing penalties for firing workers (Levy, 2010). While informal work is not directly illegal, workers employed by informal firms are not technically employees (Levy, 2010). Due to the lack of employee status, informal firms do not face the same legislation. For example, informal firms do not have to pay the minimum wage, workers cannot organize into unions, and firms do not contribute to social security (Levy, 2010; Busso et al., 2012). Adjustment costs are therefore lower in the informal sector, and we may expect a greater decline in employment for those workers. Due to the relative size of the informal sector in Mexico relative to high-income countries, we may observe different patterns across contexts. Further, because women have historically had higher participation in informal and unpaid work than men (Ortega-Díaz, 2020), the informal economy is especially important in the context of the gendered recession.

Second, women in Mexico have lower labor force participation than in high-income countries. Historically, women in middle and low-income countries have had lower labor supply (Goldin, 1994), which is at least partially due to cultural norms against women working, especially in Latin America (Arceo-Gomez and Campos-Vazquez, 2010). Today, just under 50 percent of women participate in the labor force in Mexico (Novta and Wong, 2017; Bustelo et al., 2019), with higher labor supply from single, younger, and more educated women (Novta and Wong, 2017; Bustelo et al., 2019; Hoehn-Velasco and Penglase, 2019). Married women have the lowest labor force participation (Psacharopoulos and Tzannatos, 1993), at less than 45% in the ENOE survey over 2007-2019 (Hoehn-Velasco and Penglase, 2019). The low labor supply of married women suggests that women may not face the same trade-offs as in high-income countries when schools and childcare centers closed during the pandemic.

Third, women (and especially low-income women) face barriers to childcare access in Mexico (Ángeles et al., 2011; Calderon, 2014; Mateo Díaz and Rodriguez Chamussy, 2013). Previous work has demonstrated that access to childcare can be alleviated with public programs (Ángeles et al., 2011; Calderon, 2014; Mateo Díaz and Rodriguez Chamussy, 2013). When women gain access to childcare, they increase their labor supply. Thus, if childcare access increases female labor supply, we might expect the opposite effect when childcare centers close during the pandemic. This lack of childcare access should have similar consequences to high-income countries during the pandemic and potentially pressure women out of the workforce.

Finally, another factor that may increase women's employment during the COVID-19 pandemic is the added worker effect. In middle and low-income countries without unemployment insurance, women may be faced with economic pressure to enter the labor force when their husband becomes unemployed (Kohara, 2010; Novta and Wong,

2017). This pressure may push women into the labor force during downturns (relative to men) (Skoufias and Parker, 2006; Novta and Wong, 2017). Previous work has shown that women's labor supply may increase during a recession. Skoufias and Parker (2006) demonstrated that women during Mexico's peso crisis increased their labor supply to compensate for their husbands' job loss.

Composition of the Mexican Economy Due to the importance of the service sector in the COVID-19 recession (Alon et al., 2020), it is important to note the compositional differences between the Mexican economy and that of high-income countries. Mexico's economy is less reliant on the service sector relative to other more developed nations. According to the CIA factbook, Mexico's economy is only 64.5% service sector, while the United States is 80% service sector (Agency, 2017). Industry makes up 31.9% of the economy in Mexico, whereas it makes up 19.1% of the economy in the United States. Agriculture makes up the remaining portion of the economy, 3.6% in Mexico and 0.9% in the United States. The importance of person-to-person contact and women's role in service jobs makes the differences in the composition of the economy between the United States and Mexico relevant for interpreting the findings of this study. Due to the structural differences in the economies, and the lower reliance on the service sector, women's labor supply changes in Mexico may be distinct from high-income countries.

4 Data

We use quarterly data from Mexico's National Employment and Occupation Survey (*Encuesta Nacional de Ocupación y Empleo* or ENOE). This data is available from 2005 through the present and follows individuals in a rotating panel. Each wave, one-fifth of households move into and out of the survey. During the COVID-19 pandemic, data collection of the ENOE turned into a telephone survey. For the three months of April, May, and June, the ENOE became the Telephone Survey of Occupation and Employment (Encuesta Telefónica de Ocupación y Empleo or ETOE). This survey occurred monthly rather than once over the quarter.

The ENOE tracks household composition and the characteristics of each member in the household. The survey records each members' education, labor force participation (hours worked and employment), time use in several household activities, monthly income, and key demographic characteristics. The data is an unbalanced panel, as individuals leave the sample early for various reasons, including divorce, death, or loss of follow-up. These reasons for leaving the sample are tracked and recorded. In some cases, this attrition only results in one person from the household exiting the sample, and in other cases, the entire household is lost from the panel.

Table 1 presents descriptive statistics for our analysis sample over the pre and post period of the COVID-19 pandemic. The pre-period includes 2019Q2-2020Q1, and the post-period consists of April, May, and June of 2020. We include individuals who are ages 18 to 64 and observed both pre and post-recession for the analysis sample. The final sample comprises roughly 27,000 individuals (approximately 118,000 observations). While the sample size is relatively small, the ETOE sample is representative at the national level.[4]

Prior to the pandemic, 57.5% of women were employed. Then, following the onset of the pandemic, the share of women working fell to 41.5%. For men, 83.3% were employed prior to the recession, and 69.5% after. On the intensive margin of employment, hours spent working declined by 10 hours for women and 13 hours for men. This reduction in hours worked reflects both lower hours for employed workers and extensive margin job loss.

We then categorize employment by sector, with the categories being manufacturing, commerce, service, agriculture, as well as an other category. Similar to Alon et al. (2020)'s findings in the United States, women in service-sector jobs experienced the greatest decline in employment as the share employed in the service sector fell by ten percentage points. Work in the commerce sector was also slightly affected, falling by five percentage points for women. For men, service sector jobs fell by 11 percentage points. Employment in manufacturing fell for both men and women, with men experiencing a more considerable, five percentage point decline. Work in agriculture increased, though this is likely due to the seasonality of agricultural work.

We then consider more specific time-use activities, including household production and time spent caring for others (including children). We define time-use categories based on the ENOE definitions, where individuals report both hours and minutes spent in each of these categories.[5] Women slightly increased their time spent on household chores or household maintenance by eight-tenths of an hour per week (20.2 to 21.0), while men increased their weekly time spent on the household by 1.4 hours (6.3 to 7.7). Time spent caring for others (children, the sick, the elderly) also increased slightly for women from 7.6 to 8.7 hours per week. We see no similar change for men. Throughout the analysis, we treat time spent caring for others as a proxy for time spent caring for children.

Finally, we also show individual monthly income in both its level form (measured in pesos) and log form. We use the log of income plus one to capture zero earners, which is especially important, as many individuals fall to zero income during the pandemic.

[4]Of the 27,514 individuals included in the sample of adults, individuals 18-64 observed before and after the pandemic, 728 or 2.24% percent leave the sample early due to attrition.

[5]If an individual reports any time use measure, they are included in the time use sample. If individuals report no measure of time use, we replace all their time use values with missing rather than zeros. If an individual reports one measure of time use, but not another, we assume the categories that are left blank indicate zero hours on that activity.

In the level form of income, monthly income for women declined by 800 pesos. For men, monthly income declines by 1,300 pesos. These reductions represent 25-30% of pre-pandemic income.

While our paper's focus is on labor supply and time use for adults, we study the effects on children as well. We examine changes in child time use, school attendance, and employment. Table A.1 shows the descriptive statistics. Children show a large drop in time spent on schoolwork (18 hours). Despite the change in school time, there is a lower relative change in reported school attendance. Children also did not significantly change their employment on either the intensive or the extensive margins. Similar to adults, children spent slightly more time on household chores and maintenance. Overall, the biggest change for children between 6 and 16 is time spent on schoolwork, representing a more than 50% drop. This decline in hours spent on school-related activities corroborates the summary statistics for adults, indicating that parents did not compensate for the lost school time with homeschooling activities.

5 Empirical Strategy

We study the effect of the recession on the labor supply, time use, and income of individuals using the ENOE panel. We compare the effect of the recession over April, May, and June 2020 relative to the quarters leading up to the recession, 2019Q2-2020Q1. We only include individuals who were directly exposed to the recession, where we observe them before and after the COVID-19 pandemic.

More specifically, we estimate the labor supply and time use of individual i during time t as:

$$Y_{it} = \alpha + \beta \, \text{COVID}_t + \mathbf{X}_{it}'\gamma + \alpha_i + \tau_T + \epsilon_{it} \tag{1}$$

where Y_{it} is the outcome of interest and includes labor supply, income, and time use. COVID_t indicates the post-recession time periods, including the three months of April, May, and June, relative to 2019Q2-2020Q1. X_{it} are individual-level controls that include indicators for age and the number of household members. α_i are individual-level fixed effects. Individual fixed effects capture any time-invariant characteristics of individuals. τ_T are the quarterly fixed effects. We cluster standard errors at the individual level because we expect individual outcomes to be correlated over time (Bertrand et al., 2004).[6]

In additional specifications in the appendix, we also include linear time trends, $\phi_i t$, for each time period of the sample. Individual-level time trends capture effects that change linearly over the sample, such as changes in time spent on children as the children

[6]Note that we are unable to include state fixed effects in Equations 1 and 2 as the state does not vary within individual.

age (see Table C.4). We do not include the linear trends in the baseline specification because the gap between the pre and post-period is large. The results with trends, however, largely reflect the baseline findings.

5.1 Event Study Design

We then show the results over time in an event-study design, where the event is the onset of the recession. We test whether the individuals in our sample experienced changes in their labor supply, income, or time use in each time period following the COVID-19 pandemic. Tracking changes in labor supply and time use in each wave allows us to observe how an individual's labor supply and time allocation changes in each period before and after the recession. Observing the pre-period allows us to note any pre-trends in the data.

Our event-study specification appears as:

$$Y_{it} = \alpha + \sum_{Q=-4}^{2} \beta_Q \, \text{COVID}_Q + \mathbf{X}_{it}'\gamma + \alpha_i + \epsilon_{it} \tag{2}$$

for the outcome Y, including time use and income, for individual i during time t. Here the main effect of the recession is captured by the event-study indicator variable, COVID_Q. Q represents the period relative to the recession and covers four quarters before and the three survey waves after the recession, where the post-period is in months. We exclude the quarter before the recession, $Q = -1$, as the baseline period. The excluded period is 2020Q1. We also include individual fixed effects as α_i.[7]

6 Results

6.1 The COVID-19 Pandemic Effects on Men and Women

Main Findings We show the severity of the COVID-19 recession for all adults in Table 2. We show the results for men and women separately in Table 3. Both tables reflect the results from Equation 1. For the labor supply outcomes, employment at both the intensive and extensive margins declines substantially during the COVID-19 pandemic. The percentage decline in employment is 17.5 and 21.5 for women and men, respectively. The reduction in employment is higher in absolute terms for men, though the relative decline is greater for women. A similar pattern can be seen along the intensive margin,

[7] We are unable to include time fixed effects in Equation 2 as they not vary within individual and event-study indicator.

as women experience a 12 hour per week decrease in hours worked. Men's weekly hours worked declined by 18 hours per week.

We next look at the informal and formal sectors separately in Columns (3) to (6). As expected, we see a greater decline in the rate of informal sector work relative to formal sector work (13.8 percentage points in the informal sector compared to 5.5 percentage points in the formal sector). Among those still working, hours worked per week declined by more in the formal sector.

Moving to time use, we observe no change in hours caring for others or household production. However, once we divide the sample by gender, we find that men increased their household production time by 1.2 hours per week. Surprisingly, we observe no similar increase for women. These findings diverge slightly from results in the United States, where Leukhina and Yu (2020) finds comparable increases in home production for married men and women. However, the magnitude of the effect is comparable to Leukhina and Yu (2020), where time spent on household production increased by 1.7 hours for U.S. households.

Income also fell substantially at the onset of the pandemic. The final two columns of Table 2 and Table 3 present monthly income in pesos and the log of monthly income plus one (to include zeros). For monthly income in levels, in the full sample, individuals lose 1,400 pesos during the pandemic, a more than 30% decline in income from pre-pandemic levels. In Table 3, women's monthly income falls by 900 pesos per month, while for men, income drops by 1,800 pesos per month. This constitutes a 25 and 36 percent reduction for women and men, respectively. In the final columns of each table, we show the log of income plus one. The log of income plus one displays similar, but slightly higher, percentage reductions to its level form.

Robustness of the Main Findings To test whether the results are robust over different specifications, we show alternatives forms of Equation 1 in Table 3 throughout Appendix Section C. These specifications include the results without controls (Table C.1), without quarter fixed effects (Table C.2), without individuals fixed effects (Table C.3), with time trends (Table C.4), and in the balanced panel of individuals (Table C.5). All results maintain the theme of the baseline findings, with the magnitudes changing slightly between tables.

Event-Study Findings To illustrate the time-varying effects over the course of the pandemic, we show the event-study results from Equation 2 in Figures I and II. Figure I presents the labor supply effects of the COVID-19 pandemic. The reduction in employment appears to be similar for men (in green) and women (in purple). Both men's and women's employment starts to rebound by the third month of the pandemic. We see that

formal employment initially declined by slightly more for men than women and that this difference has increased throughout the pandemic. Informal employment decreased similarly for men and women and has begun to recover for both in the most recent observable month. A similar pattern can be seen for hours worked.

Figure II demonstrates that monthly income declined by more for men, in both the level and the log specification. For women in the level specification, monthly income declines by less than men, but in the log of income plus one, the drop in income is closer in magnitude between men and women. By the third month of the pandemic, men start to recover their monthly income faster than women, which is more apparent in the log specification.

The bottom two panels of Figure II show men compensate for their employment losses by spending more time on household-related activities. This spike in household production is apparent over the first two months of the pandemic, but then starts to decline by month three as men return to work. Women increase their time spent on the household in the second and third months of the pandemic, just as men's household production begins to fall. There is no reallocation towards time spent caring for children for men or women.

Overall, the findings suggest that women are no more burdened than men during the pandemic. Both men and women experienced considerable reductions in employment, hours worked, and income. These findings contrast with the existing literature in the United States, where recent work has found women to have disproportionately been harmed by the pandemic (Alon et al., 2020; Cajner et al., 2020; Farré et al., 2020).

6.2 Why has the COVID-19 Recession Differed Across Countries?

There are several reasons for the distinct effects of the COVID-19 recession in Mexico compared to high-income countries like the United States. First, women in Mexico have a relatively low labor supply (OECD, 2020). Women may face social stigma to working, resulting in lower pre-pandemic employment rates (Arceo-Gomez and Campos-Vazquez, 2010). There is, therefore, less slack for women's employment to decline during the pandemic relative to the United States and other high-income countries.

A second potential factor explaining the differences observed in this study is the importance of informal work in Mexico. Mexican women are more likely to be participating in informal and unpaid work (Ortega-Díaz, 2020) and are therefore affected differently than women in high-income countries where formal work plays a larger role. Informal laborers benefit from few employment protections; there is no minimum wage, access to unions is nonexistent, and are there few protections over firings (Levy, 2010; Busso et al.,

2012). Our analysis highlights the importance of informal work. We demonstrate that while informal work fell more rapidly than formal work in the early stages of the recession, it has rebounded faster than formal work in recent months. Given the flexibility of informal work, it is not surprising that employment can rebound relatively quickly.

A third reason the recession has not been disproportionately hard on women is the relatively lower rates of service sector work in Mexico relative to the United States. Mexico's economy is only 64.5% service sector, compared to 80% in the United States (Agency, 2017). We examine the importance of sector-specific work in how men's and women's employment responded to COVID-19 in Table 4. In Panel A, we see that women experienced employment losses primarily in communications and the service sector, with only minor job losses in construction and manufacturing. In Panel B, the results show that men in the construction and manufacturing sectors experienced the highest job loss. Interestingly, men were more likely to lose jobs in the service sector relative to women. The results by sector suggest that while the pattern of job loss is similar to the United States, women do not appear to be disproportionately affected relative to men. Both men and women participate in the service sector and are similarly affected during the pandemic.

A fourth explanation is the role of childcare, which past research has shown to be an essential factor in constraining labor supply decisions in Mexico (Ángeles et al., 2011; Calderon, 2014; Mateo Díaz and Rodriguez Chamussy, 2013). Less contact with relatives and the closure of schools and daycares during the pandemic may have exacerbated childcare needs. Recent work by Heggeness (2020) supports this hypothesis in the context of COVID-19 in the United States. Heggeness (2020) found women with children experienced greater job losses than men and childless women. We explore the importance of childcare in our sample by restricting our sample to households with children (both school-aged and younger) in Figure III and Appendix Table C.6. Table C.6 demonstrates that women in households with children are less affected by the recession than in the full sample. Women in households with children have lower labor supply pre-COVID-19, which explains the blunted impact. In households with children, similar to the full sample, women also fail to reallocate their time towards children and spend less time on the household. Men in these households have similar employment reductions and devote more time to the household post-pandemic. While we expected differential effects by children's presence, households with children fail to show close similarities to related contexts (Heggeness, 2020; Alon et al., 2020).

A final explanation for the lower reduction in women's labor supply is the added worker effect. In previous recessions, women in Mexico entered into the labor force to compensate for their husband's job loss (Skoufias and Parker, 2006; Novta and Wong, 2017).[8] We test this hypothesis by comparing women who were working prior to the

[8]This effect has been demonstrated in other contexts as well, e.g., in Kohara (2010).

recession with those who were not. These results are shown in Figure A.1. The plotted points suggest that some women who were not working before the recession begin working afterward, suggesting that the added-worker effect may be at play. Moreover, we see a reduction in household work for women who were not working previously.

The added-worker effect findings suggest that some women entered the labor force during the economic crises to compensate for their husbands' job losses. This evidence aligns with previous work by Skoufias and Parker (2006) and Novta and Wong (2017). Given the weakness of the unemployment system in Mexico relative to the United States, our overall results are not surprising. The lack of income support given to Mexican families in response to the pandemic pushed women into the labor market. The same dynamic is likely less present in the United States, where (at least initially), households may have benefited from generous unemployment insurance. Nonetheless, the size of the added-worker effect may have been muted due to fear of infection. Investigating long-term responses to the pandemic will shed more light on this mechanism.

Overall, the above explanations help explain the differences in employment effects in Mexico relative to other contexts, and specifically why this recession has not disproportionately harmed women as it has in other settings. Understanding the characteristics of the Mexican labor market is essential to understand the observed differences. Our results suggest that more work is needed to understand how the pandemic has affected workers in alternative settings.

6.3 Intra-household Changes in Time Use and Income

Labor supply decisions are not made independently of one's partner. We, therefore, next examine relative changes in labor supply and time use across couples in response to the pandemic. We select a subsample of heterosexual couples consisting of one man and one woman. Among these couples, we calculate the woman's relative contribution to household production, income, and labor supply. All measures are bounded between zero and one by construction, with higher values indicating the woman contributing relatively more. For households with no income, we assign a share of one half to the woman. We do the same when both members of the couple have zero values for any of our other outcomes of interest.

We present the results in Table 6. For each outcome variable, we first report the results where we drop any household where both members have zero values for the outcome of interest. These results are presented in odd-numbered columns. We then replace zeros with contributions of one half in even-numbered columns, which are our preferred estimates. Looking first at the measures of employment and income, we find evidence that woman's relative contribution increased due to the pandemic. We interpret

this result as evidence that women are either compensating for their partner's reduced employment, or that women are not as harmed by the pandemic as their partners.

We next examine time use measures in Columns (5) to (8) of Table 6. The results are again similar to the main results, as we find that men increase their relative time spent on household production. Despite this increase in household work, there is no relative change in time spent in childcare. These findings again suggest that the Mexican households did not shift the burden of household chores and childcare to women during the pandemic.

6.4 Effects on Children

We conclude our main results by considering the effects of the pandemic recession on children. We are particularly interested in testing whether children reduced their time spent on schoolwork as well as their school enrollment post-pandemic. Given that parents did not increase their time spent with their children, we expect that children reduced their time on schoolwork. In our analyses, we include all children who are 6 to 16 who are observed before and after the pandemic. We select children in this age range, as upper secondary school (targeting 15 years of school) is mandatory in Mexico (UnoiNews, 2012).

In Panel A of Table 5, our results demonstrate that children did not change their enrollment, but they did substantially reduce their time on schoolwork. In Column (1), the probability of being enrolled in school is unchanged across the pre- and post-pandemic periods. Children who were in school before the pandemic continued to report school attendance during the pandemic. While we cannot observe whether these children continued their schoolwork, we can see how they spent their time. In Column (2), children were spending 18 hours less per week on school activities in response to the pandemic. The reduction is more than 50% of the pre-pandemic mean. When we look at children separately by gender in Panels B and C, we see slightly larger reductions for boys relative to girls. Overall, the results are consistent our parental time use results and suggest that the parents did not fully compensate for the school closures with homeschooling activities.

One crucial feature of Mexico's public education policy is essential to contextualize the results. Rather than having remote online schooling, Mexico televised learning activities. In Mexico, the vast majority of children have access to television, but do not have internet access (Córdoba and Montes, 2020; Rivers and Gallón, 2020). Thus, the time use measures are limited (at best) for examining how children were spending their time during the pandemic. Children may have entirely shifted their time to educational television, which may not be captured by our measure of schoolwork. Nonetheless, our

analysis is useful in understanding whether parents reallocated their time towards their children in response to the pandemic.

6.5 Additional Heterogeneous Effects

We conclude by documenting heterogeneous effects by income, marital status, and urban status. To begin, we show the impact by income level. We split the sample by income quartiles in Figure B.1. The results show that the bottom 25% of the income distribution experienced the largest employment reductions. These findings align with Cajner et al. (2020), in the United States, where the low-wage workers were the most affected group. Interestingly, we find that high-income individuals did not shift their time towards childcare, while those below the median income level did.

Next, we consider the effect by marital status. We find similar patterns for married and unmarried individuals in Figure B.3. Married men experienced a larger decline in hours worked, but increased their time in household production relative to unmarried men. Unmarried women had greater reductions in employment compared to married women. Surprisingly, we find married women reduced their time spent caring for others, while we observe the opposite effect for unmarried women.

We next examine differences by gender across urban and rural areas in Figure B.4. For the urban/rural divide, the results are similar, except for two points. First, urban men lose more employment on the extensive and intensive margin than rural men. Second, rural women increase their time spent caring for others by more than urban women.

Then, we document the heterogeneity over the state-level COVID-19 infection rate in the early pandemic. We classify states as high-prevalence if their state-level infection rate is over 160 by June 30th.[9] The results are presented in Figure B.5. We find that employment losses are greater, and the recovery slower in states with a high infection rate.

We conclude by dividing states by their Human Development Index (HDI). We expect states with a higher HDI to be better equipped to respond to the pandemic. The results are presented in Figure B.6. The results are similar across the sample, except that women in low HDI states did not reallocate time towards household production, while women in high HDI states spent more time on household production. For the remainder of the results, the employment losses are similar between the sample.

[9]The prevalence rate is an imperfect measure, which may cause bias in reporting.

7 Conclusion

This study shows that the COVID-19 pandemic severely impacted Mexican households. In the first three months of the pandemic, employment fell by nearly 20 percentage points, and monthly income fell by more than 30%. We do not find evidence that the COVID-19 pandemic disproportionately burdened men or women, as both experienced high reductions in employment and hours worked. We find a larger absolute decline in employment for men, but larger relative declines for women. The results suggest that men did, however, contribute more to household production in response to the pandemic, but find no similar increases for women.

We then investigate intra-household dynamics by examining the behavior of couples. We measure the relative contributions to income and household production for men and women in the same household. We find similar declines in employment across spouses (so no relative change). Similar to our findings in the full sample, men did increase their time spent on household production. Neither partner increased their relative share of time spent with children, suggesting that women were not uniquely burdened by the recession. These results differ from existing work on the consequences of the COVID-19 pandemic (Aguiar et al., 2013; Alon et al., 2020; Czymara et al., 2020; Leukhina and Yu, 2020; von Gaudecker et al., 2020; Bartik et al., 2020). These related studies have focused primarily on high-income settings, which may not be generalizable.

To better understand how households responded to the pandemic, we also measure changes in children's time use during the pandemic. While children did not change their school enrollment, they did reduce their time spent on schoolwork by more than 50% of the pre-pandemic mean. We find no evidence of parental compensation for the lost instructional time. Parental time use does not shift towards children during the first three months of the pandemic. This finding indicates that the pandemic's true burden may then be on children, and future research should consider the detrimental effects of lost school time. Ideally, public policies would direct support towards remediating the adverse effects on children. These child-focused challenges are unique to the pandemic recession relative to previous economic downtowns.

8 Tables

Table 1: Descriptive Statistics, Adults 18-64

	Women Pre	Women Post	Men Pre	Men Post
	Mean	Mean	Mean	Mean
Employment				
1(Working)	0.575	0.415	0.833	0.695
1(Manufacturing/ Construction	0.083	0.071	0.242	0.188
1(Commerce)	0.132	0.085	0.132	0.106
1(Service)	0.344	0.244	0.379	0.267
1(Agriculture)	0.011	0.013	0.065	0.125
1(Other)	0.005	0.002	0.014	0.010
Time Use				
Hours Worked	21.208	11.800	37.937	24.834
Hours on House	20.221	20.979	6.307	7.659
Hours Caring for Others	7.614	8.733	2.564	2.654
Income				
Log(Monthly Income +1)	3.461	2.492	5.086	4.275
Monthly Income	2,656.862	1,862.117	4,928.932	3,602.394
N	32,921	28,773	30,128	26,605

NOTES: The main sample includes individuals who are 18 to 64.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table 2: COVID-19 Pandemic Recession Employment and Income Effects, Adults 18-64

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.194***	-13.901***	-0.055***	-16.547***	-0.138***	-10.054***	0.131	-0.351	-1393.784***	-1.513***
	(0.013)	(0.713)	(0.011)	(1.160)	(0.014)	(1.004)	(0.337)	(0.320)	(160.179)	(0.132)
N	118,060	118,060	118,060	42,591	118,060	26,450	103,055	101,423	118,060	118,060
Adj R-sq	0.718	0.686	0.820	0.616	0.652	0.710	0.657	0.644	0.605	0.618
Pre Mean Dep	0.698	29.201	0.363	45.001	0.335	38.350	14.329	5.511	3,742.470	4.238
Post Mean Dep	0.547	17.955	0.280	33.391	0.267	32.212	15.354	6.219	2,683.865	3.334
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels. For results with individual trends see Table C.4.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table 3: COVID-19 Pandemic Recession Employment and Income Effects for Men and Women, 18-64

Panel A: Women

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.175***	-11.768***	-0.047***	-17.178***	-0.128***	-8.538***	-0.423	-0.119	-900.763***	-1.230***
	(0.018)	(0.914)	(0.014)	(1.654)	(0.016)	(1.658)	(0.578)	(0.503)	(164.782)	(0.177)
N	61,513	61,513	61,513	17,485	61,513	11,640	59,065	59,026	61,513	61,513
Adj R-sq	0.721	0.675	0.843	0.663	0.600	0.728	0.534	0.647	0.609	0.637
Pre Mean Dep	0.575	21.208	0.280	41.598	0.295	32.362	20.221	7.614	2,656.862	3.461
Post Mean Dep	0.415	11.800	0.217	29.226	0.198	27.628	20.979	8.733	1,862.117	2.492
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

Panel B: Men

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.215***	-17.639***	-0.050***	-15.036***	-0.165***	-11.596***	1.291***	-0.227	-1832.631***	-1.802***
	(0.022)	(1.202)	(0.017)	(1.268)	(0.024)	(1.422)	(0.387)	(0.346)	(294.935)	(0.227)
N	56,538	56,538	56,538	25,104	56,538	14,810	43,983	42,389	56,538	56,538
Adj R-sq	0.664	0.651	0.793	0.578	0.681	0.690	0.452	0.508	0.588	0.573
Pre Mean Dep	0.833	37.937	0.454	47.292	0.379	43.458	6.307	2.564	4,928.932	5.086
Post Mean Dep	0.695	24.834	0.351	36.270	0.345	35.153	7.659	2.654	3,602.394	4.275
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels. For results with individual trends see Table C.4.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table 4: Post-Recession Labor Supply by Sector of the Economy, Adults 18-64

Panel A: Women

	Constr-uction	Commu-nication	Service	Agric -ulture	Other
	(1)	(2)	(3)	(4)	(5)
Post x 1(COVID)	-0.011	-0.068***	-0.083***	-0.009***	-0.004
	(0.008)	(0.012)	(0.016)	(0.003)	(0.003)
N	61,513	61,513	61,513	61,513	61,513
Adj R-sq	0.755	0.716	0.768	0.565	0.545
Pre Mean Dep	0.083	0.132	0.344	0.011	0.005
Post Mean Dep	0.071	0.085	0.244	0.013	0.002
Quarter FE	X	X	X	X	X
Individual FE	X	X	X	X	X
Controls	X	X	X	X	X

Panel B: Men

	Constr-uction	Commu-nication	Service	Agric -ulture	Other
	(1)	(2)	(3)	(4)	(5)
Post x 1(COVID)	-0.089***	-0.013	-0.100***	-0.008	-0.005*
	(0.019)	(0.010)	(0.018)	(0.009)	(0.003)
N	56,538	56,538	56,538	56,538	56,538
Adj R-sq	0.732	0.756	0.769	0.869	0.486
Pre Mean Dep	0.242	0.132	0.379	0.065	0.014
Post Mean Dep	0.188	0.106	0.267	0.125	0.010
Quarter FE	X	X	X	X	X
Individual FE	X	X	X	X	X
Controls	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.

SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table 5: Post-COVID-19 Recession on School-time, Children 6-16

	1(In School)	Hours School	1(Work-ing)	Hours Worked
Panel A: All				
	(1)	(2)	(3)	(4)
Post x 1(COVID)	-0.006	-18.124***	-0.011	-0.479
	(0.007)	(1.148)	(0.017)	(0.624)
N	35,895	11,816	35,895	35,895
Adj R-sq	0.881	0.591	0.579	0.560
Pre Mean Dep	0.963	34.565	0.040	1.039
Post Mean Dep	0.963	16.587	0.036	1.025
Quarter FE	X	X	X	X
Individual FE	X	X	X	X
Controls	X	X	X	X
Panel B: Girls				
	1(In School)	Hours School	1(Work-ing)	Hours Worked
	(1)	(2)	(3)	(4)
Post x 1(COVID)	-0.003	-17.278***	-0.001	0.050
	(0.010)	(1.349)	(0.008)	(0.176)
N	17,461	5,762	17,461	17,461
Adj R-sq	0.922	0.618	0.610	0.471
Pre Mean Dep	0.968	34.148	0.023	0.517
Post Mean Dep	0.945	16.926	0.016	0.557
Quarter FE	X	X	X	X
Individual FE	X	X	X	X
Controls	X	X	X	X
Panel C: Boys				
	1(In School)	Hours School	1(Work-ing)	Hours Worked
	(1)	(2)	(3)	(4)
Post x 1(COVID)	-0.006	-18.488***	-0.021	-0.988
	(0.009)	(1.611)	(0.030)	(1.081)
N	18,430	6,052	18,430	18,430
Adj R-sq	0.788	0.561	0.579	0.619
Pre Mean Dep	0.959	34.931	0.056	1.515
Post Mean Dep	0.980	16.291	0.054	1.459
Quarter FE	X	X	X	X
Individual FE	X	X	X	X
Controls	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The sample of children includes individuals who are 6 to 16. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.

SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

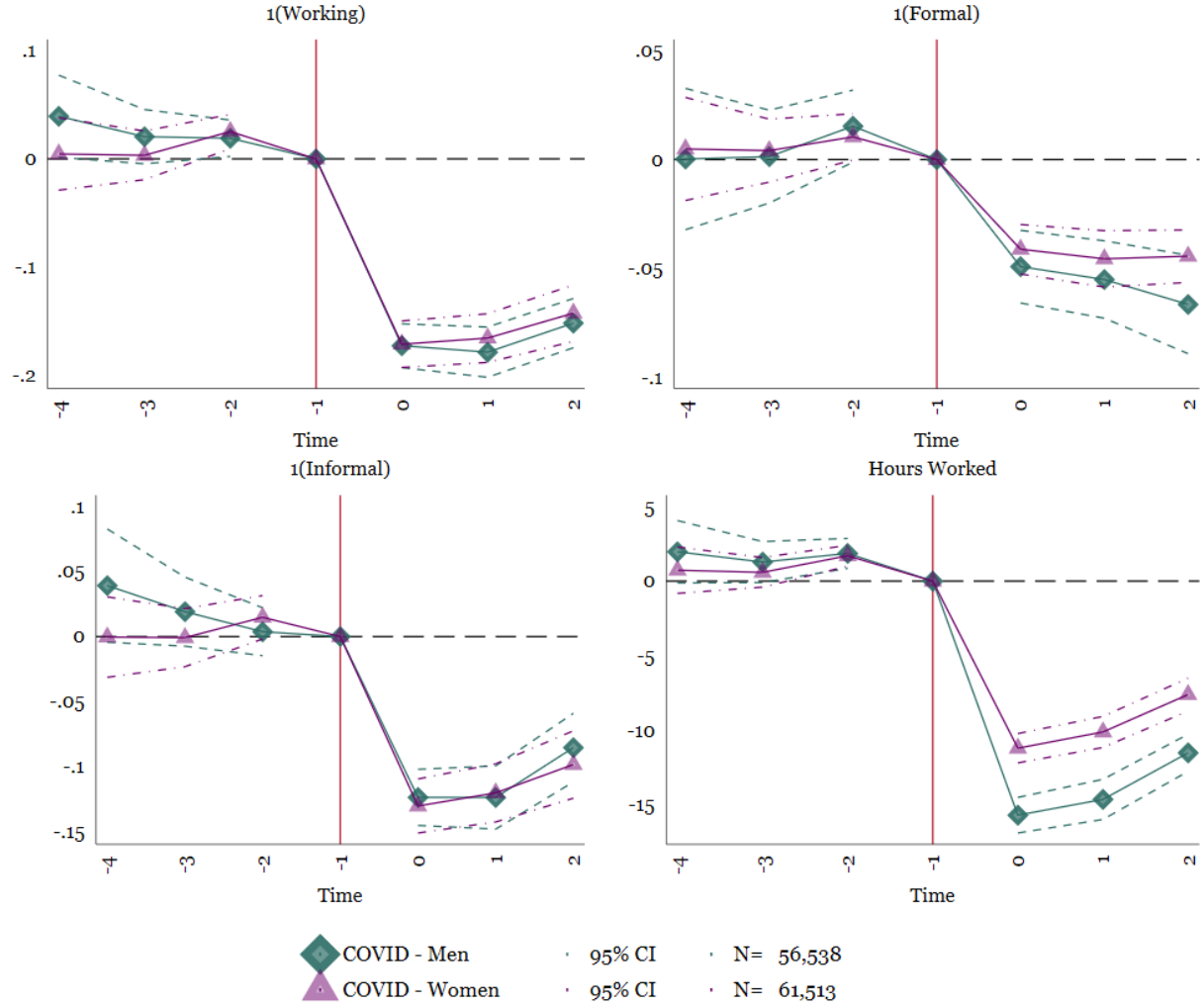
Table 6: Intra-Household Inequality: Share Contributed by the Woman

	Share Hours Worked		Share Income		Share Hours House		Share Hours Caring	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post x 1(COVID)	0.003	0.093***	0.008	0.073***	-0.034**	-0.031**	-0.014	0.005
	(0.021)	(0.020)	(0.024)	(0.022)	(0.014)	(0.014)	(0.023)	(0.016)
N	24,073	29,162	20,709	29,162	28,639	29,162	11,521	29,162
Adj R-sq	0.711	0.619	0.715	0.564	0.501	0.491	0.516	0.497
Pre Mean Dep	0.256	0.273	0.269	0.329	0.836	0.831	0.806	0.639
Post Mean Dep	0.235	0.303	0.234	0.331	0.803	0.799	0.801	0.630
Quarter FE	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X
Including Zeros		X		X		X		X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Controls for this specification include indicators for husband's age. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

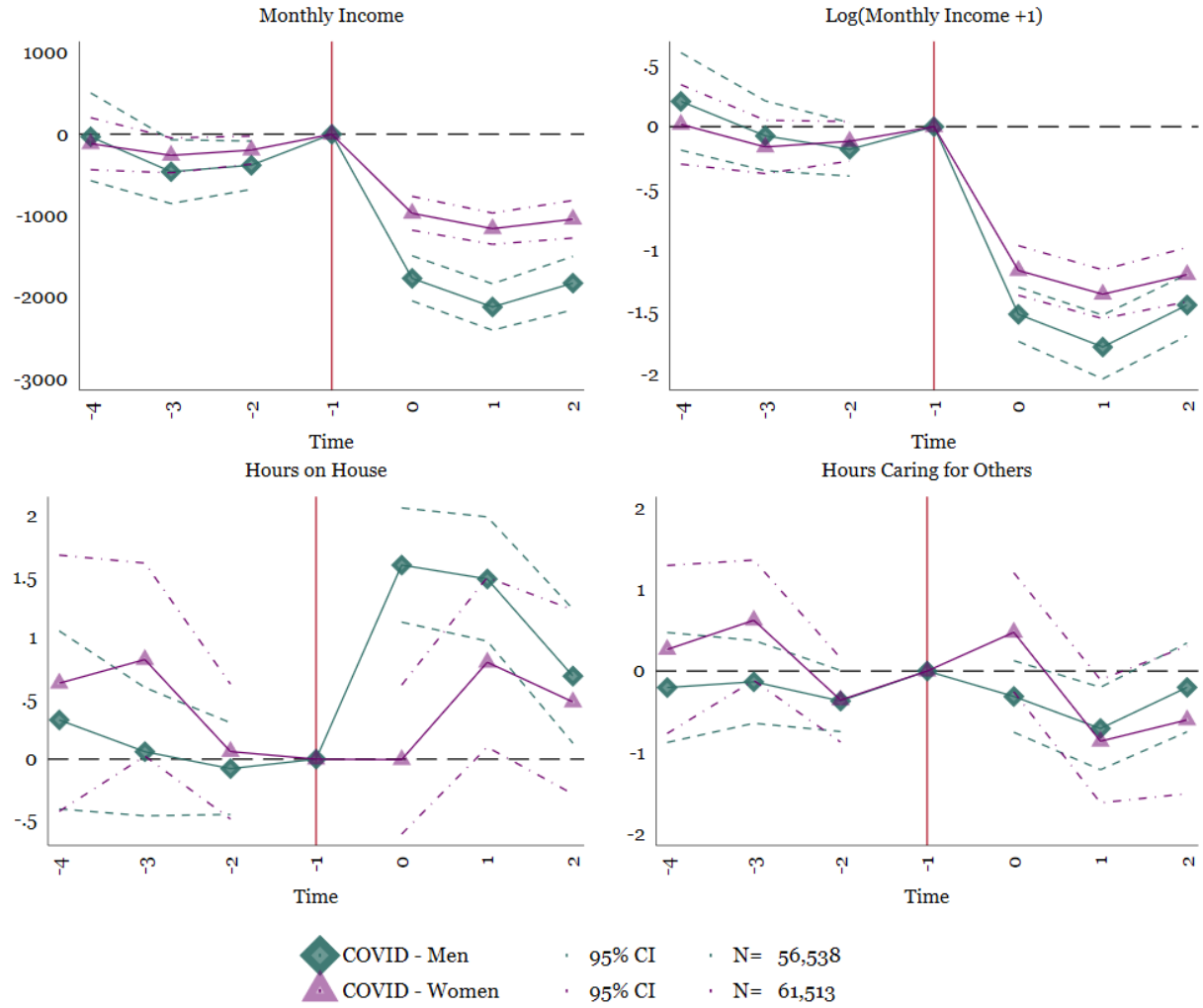
9 Figures

Figure I: Event Study: Labor Supply for Men and Women, 18-64



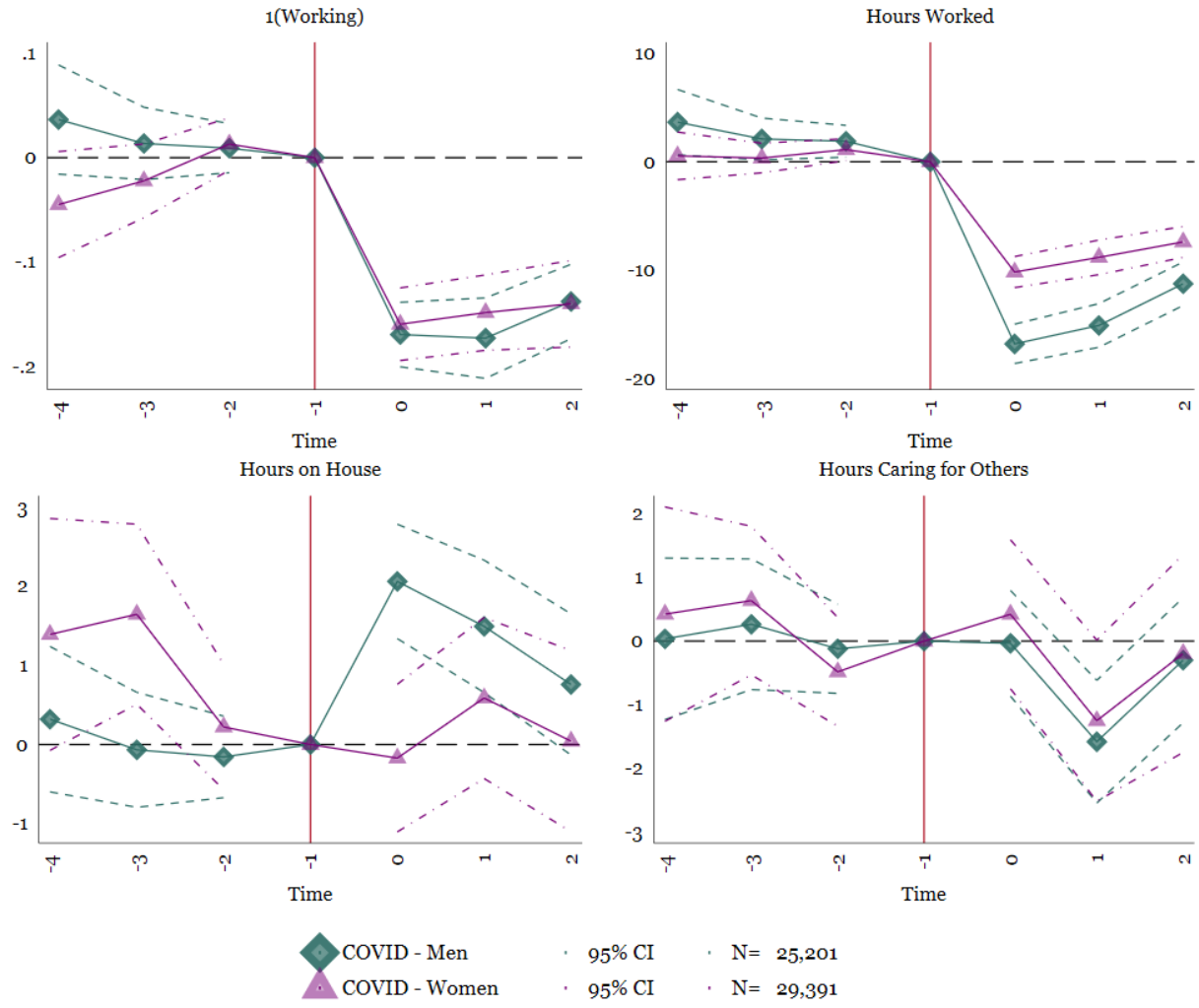
NOTES: The plotted points show the quarters leading up and following each recession, with the excluded period as 2020Q1. The post-periods indicate months while the pre-periods inducate quarters. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Figure II: Event Study: Time Use and Income Men and Women, 18-64



NOTES: The plotted points show the quarters leading up and following each recession, with the excluded period as 2020Q1. The post-periods indicate months while the pre-periods inducate quarters. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Figure III: Event Study: Households with Children, Adults 18-64



NOTES: OLS coefficients reported. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

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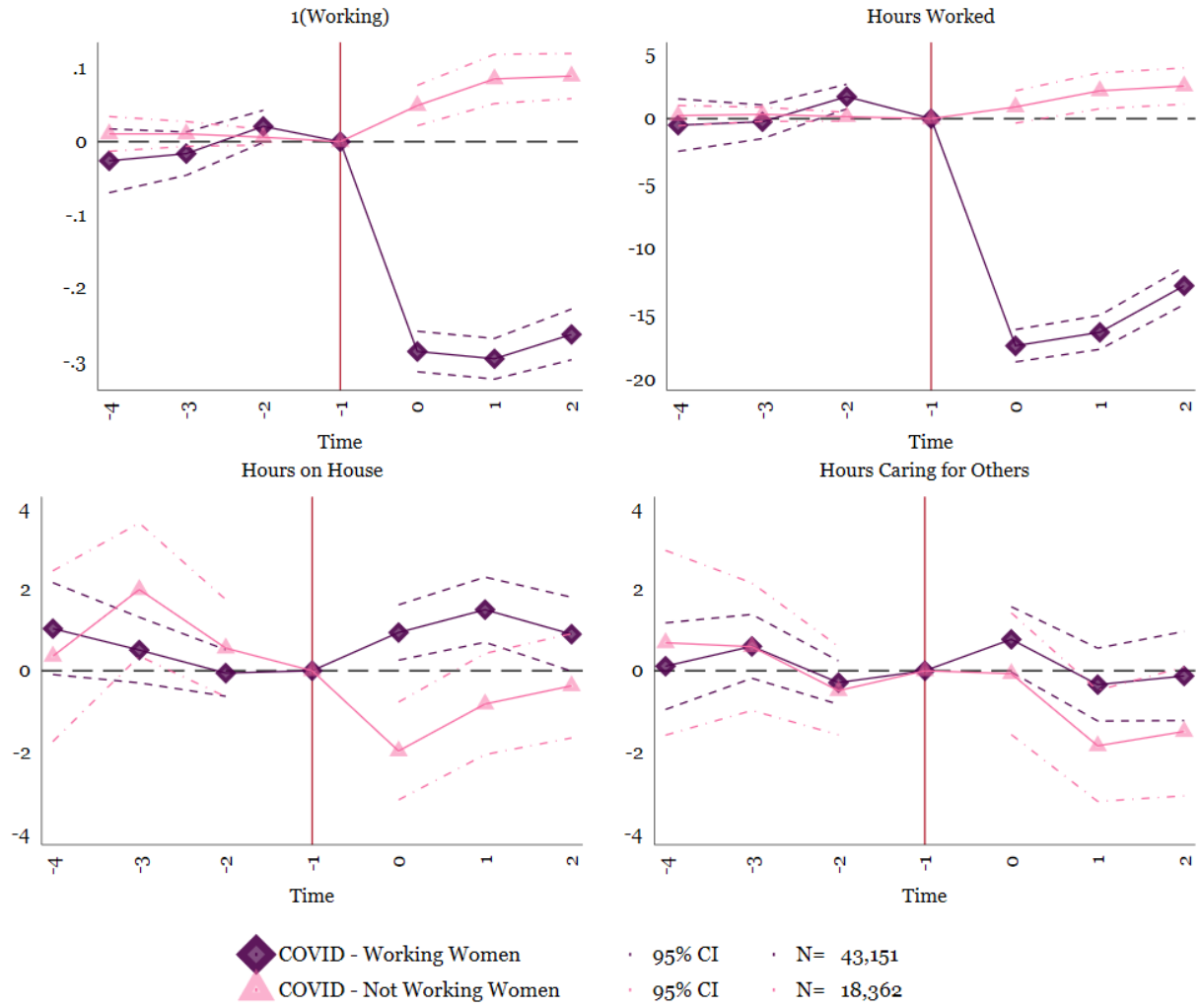
A Additional Tables and Figures

Table A.1: Descriptive Statistics, Children 6-16

	Girls Pre	Girls Post	Boys Pre	Boys Post
	Mean	Mean	Mean	Mean
1(In School)	0.968	0.945	0.959	0.980
Hours on Schoolwork	34.148	16.926	34.931	16.291
1(Working)	0.023	0.016	0.056	0.054
Hours Worked	0.517	0.557	1.515	1.459
Hours on House	7.090	8.482	4.737	5.567
N	9,349	8,238	9,905	8,667

NOTES: The sample of children includes individuals who are 6 to 16.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

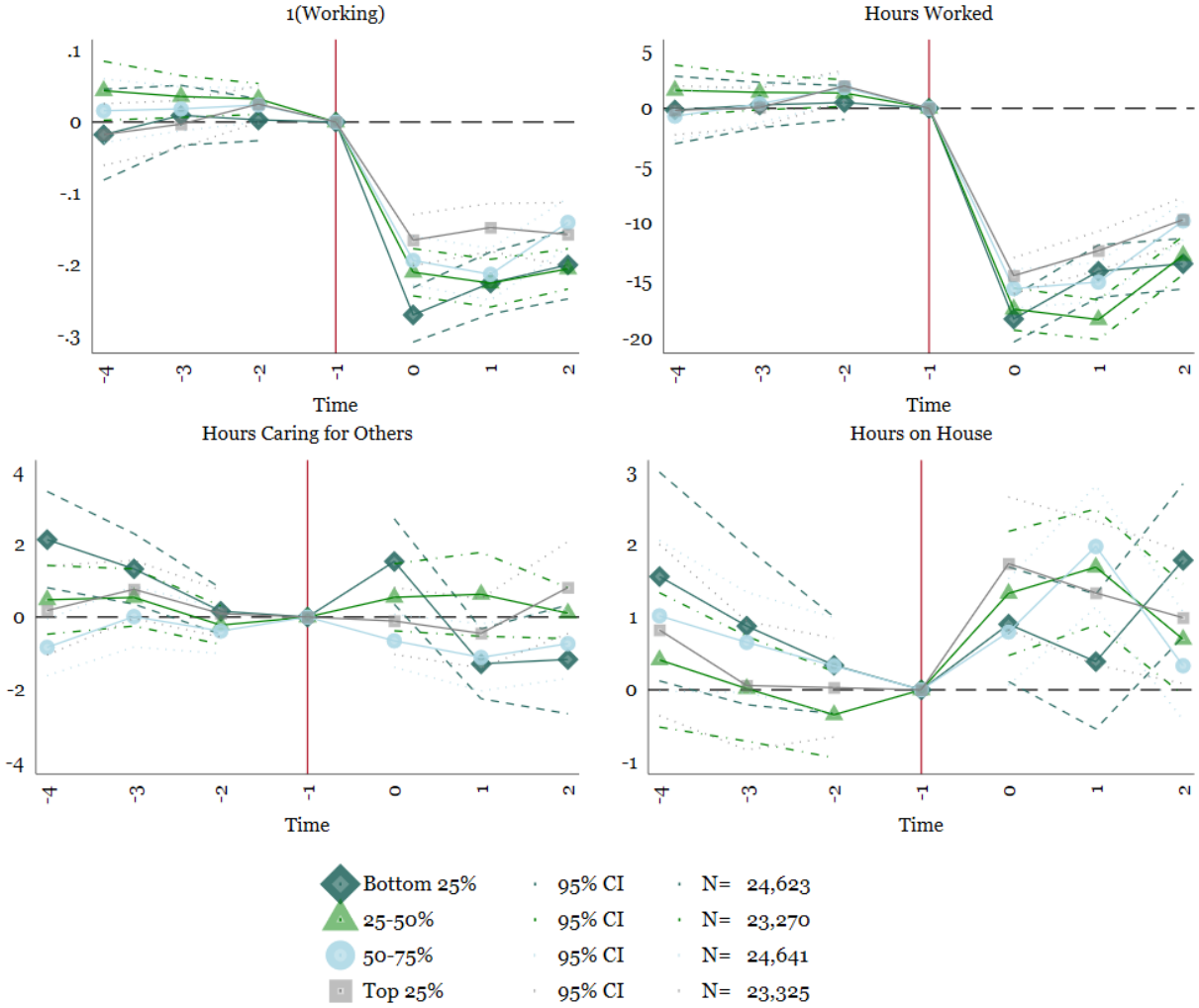
Figure A.1: Event Study: Time Use for Previously Employed v. Not Employed Women



NOTES: The plotted points show the quarters leading up and following each recession, with the excluded period as 2020Q1. The post-periods indicate months while the pre-periods inducate quarters. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

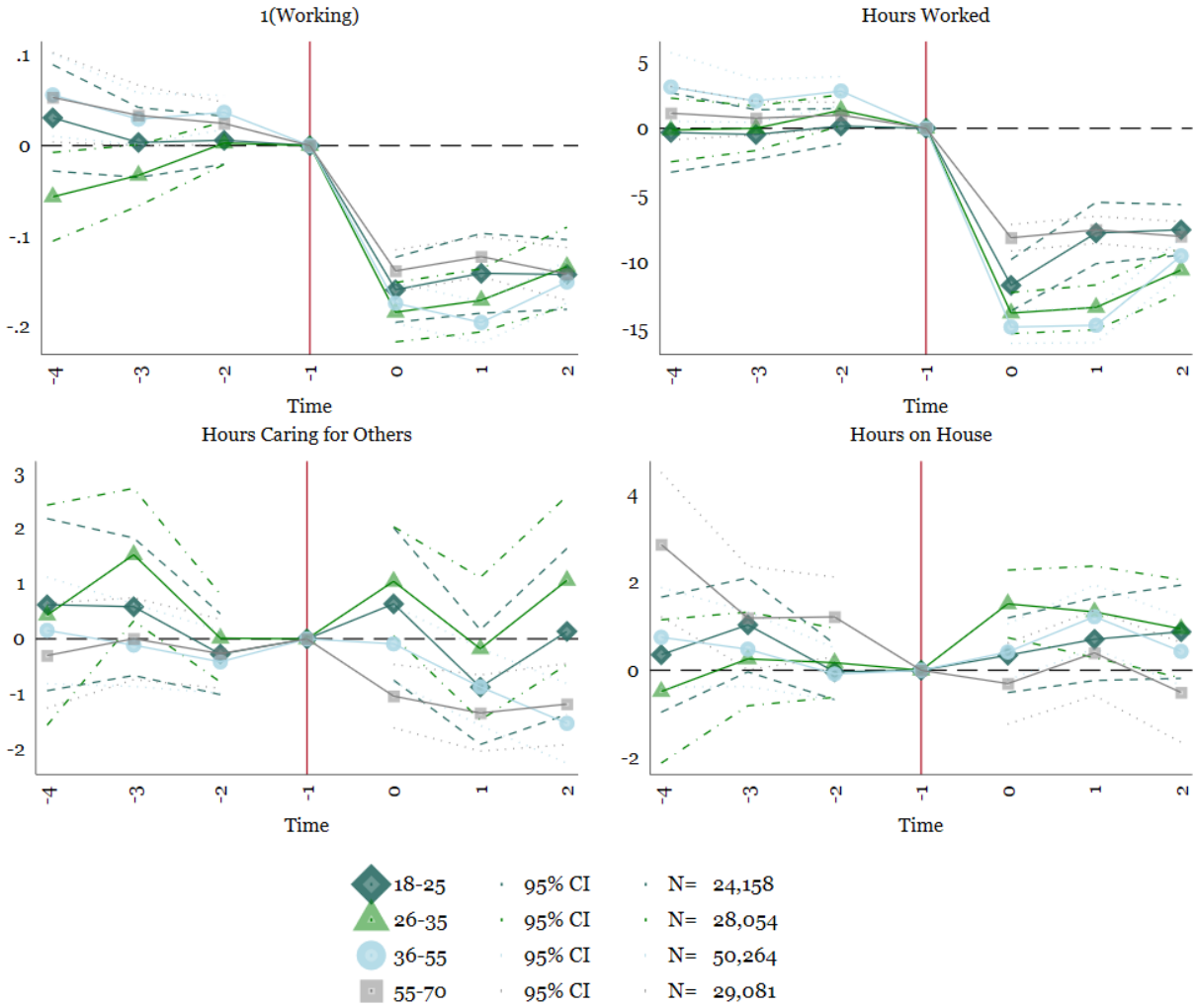
B Heterogeneous Effects

Figure B.1: Event Study: By Income Group



NOTES: OLS coefficients reported. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Figure B.2: Event Study: By Age Group



NOTES: OLS coefficients reported. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

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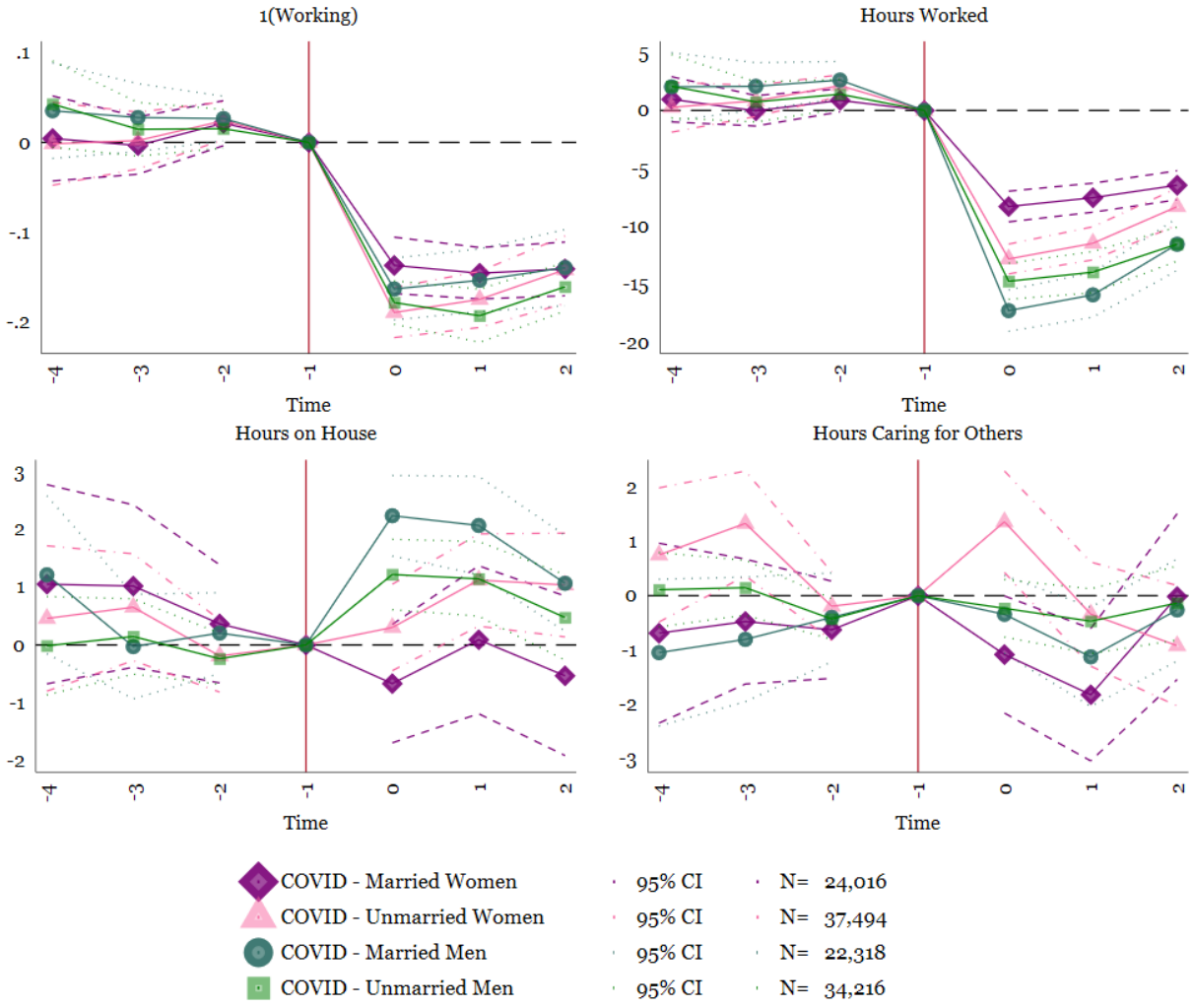
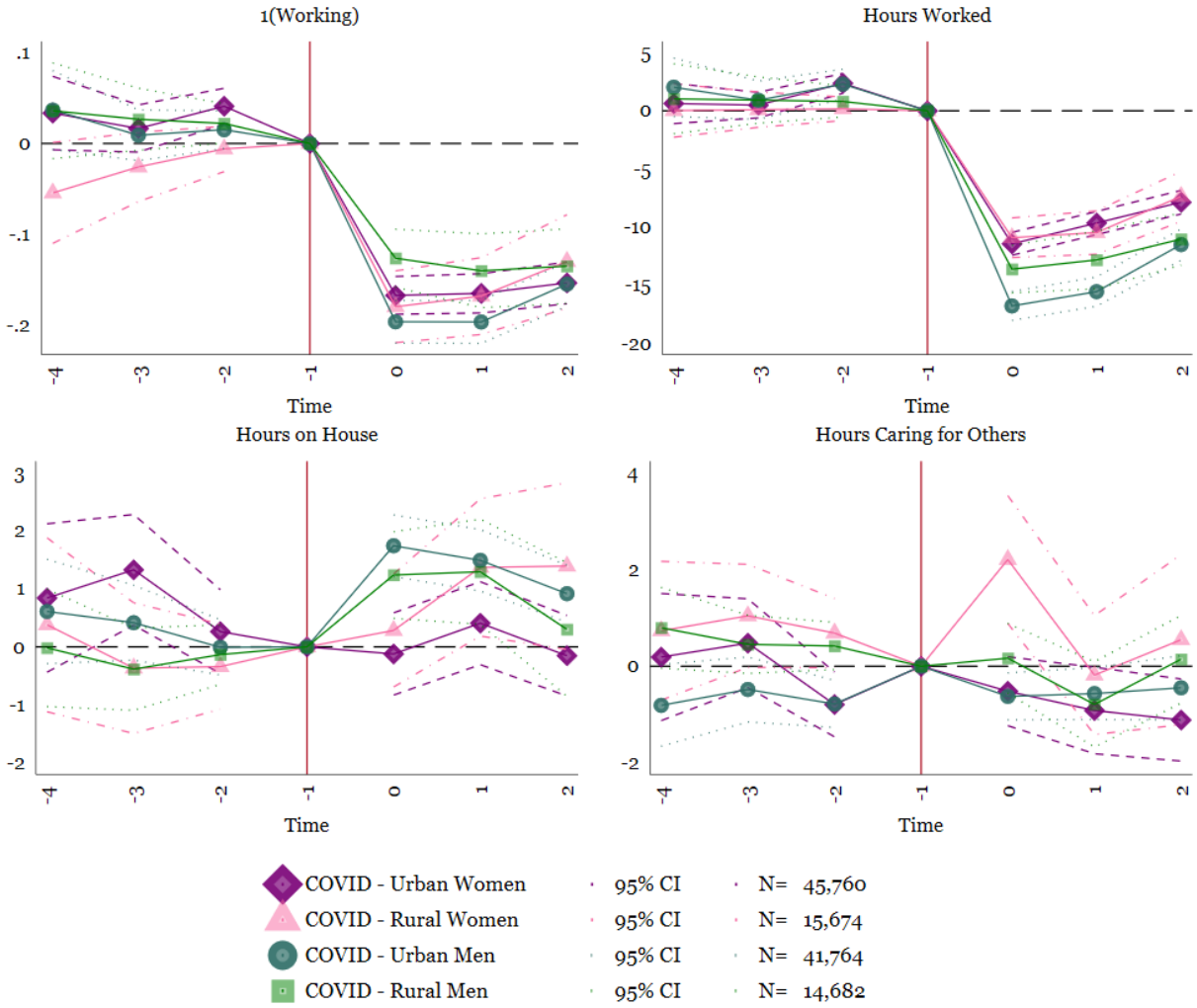
Figure B.3: Event Study: By Marital Status



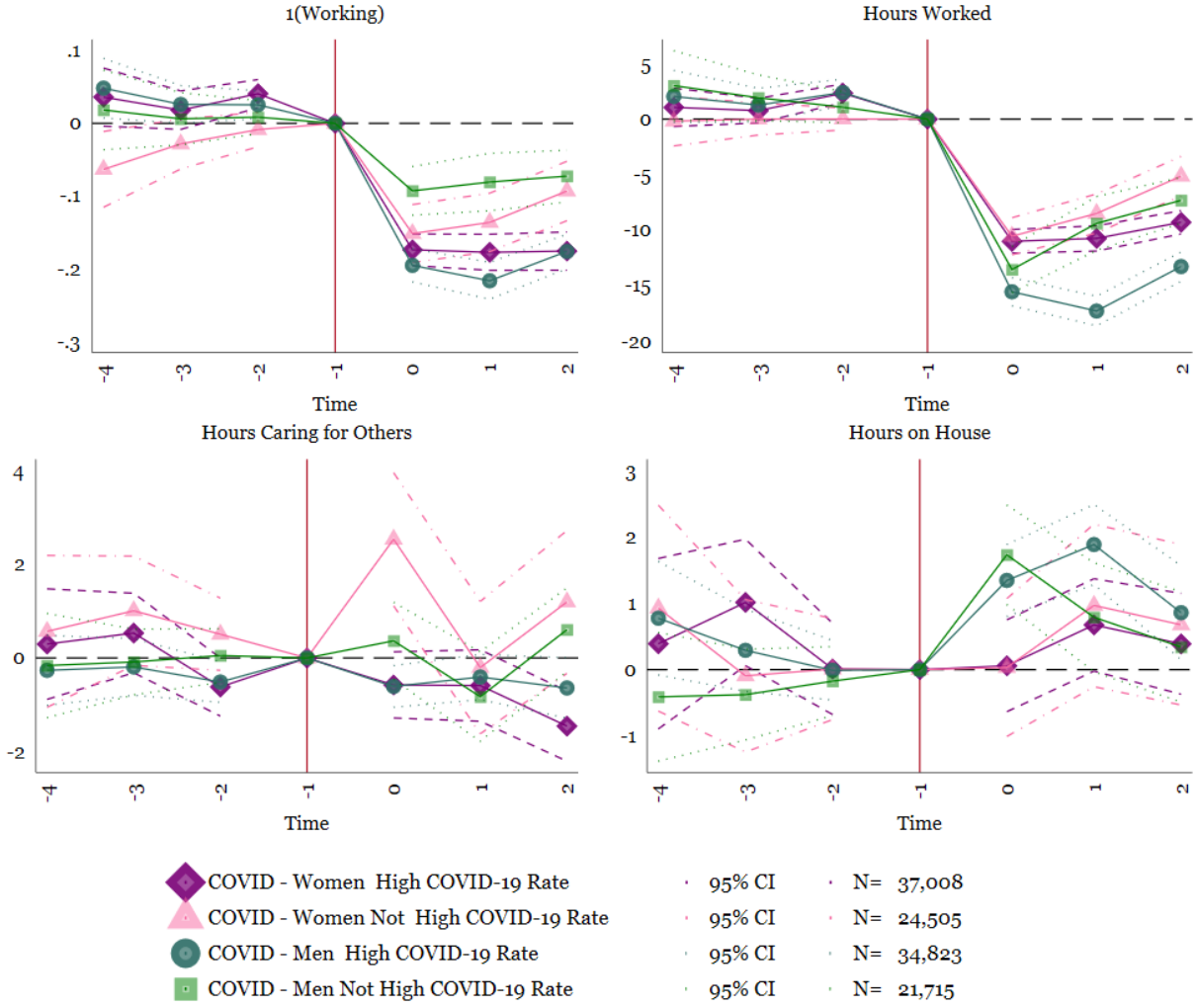
NOTES: OLS coefficients reported. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Robust standard errors are clustered at the individual level. SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Figure B.4: Event Study: By Urban Status



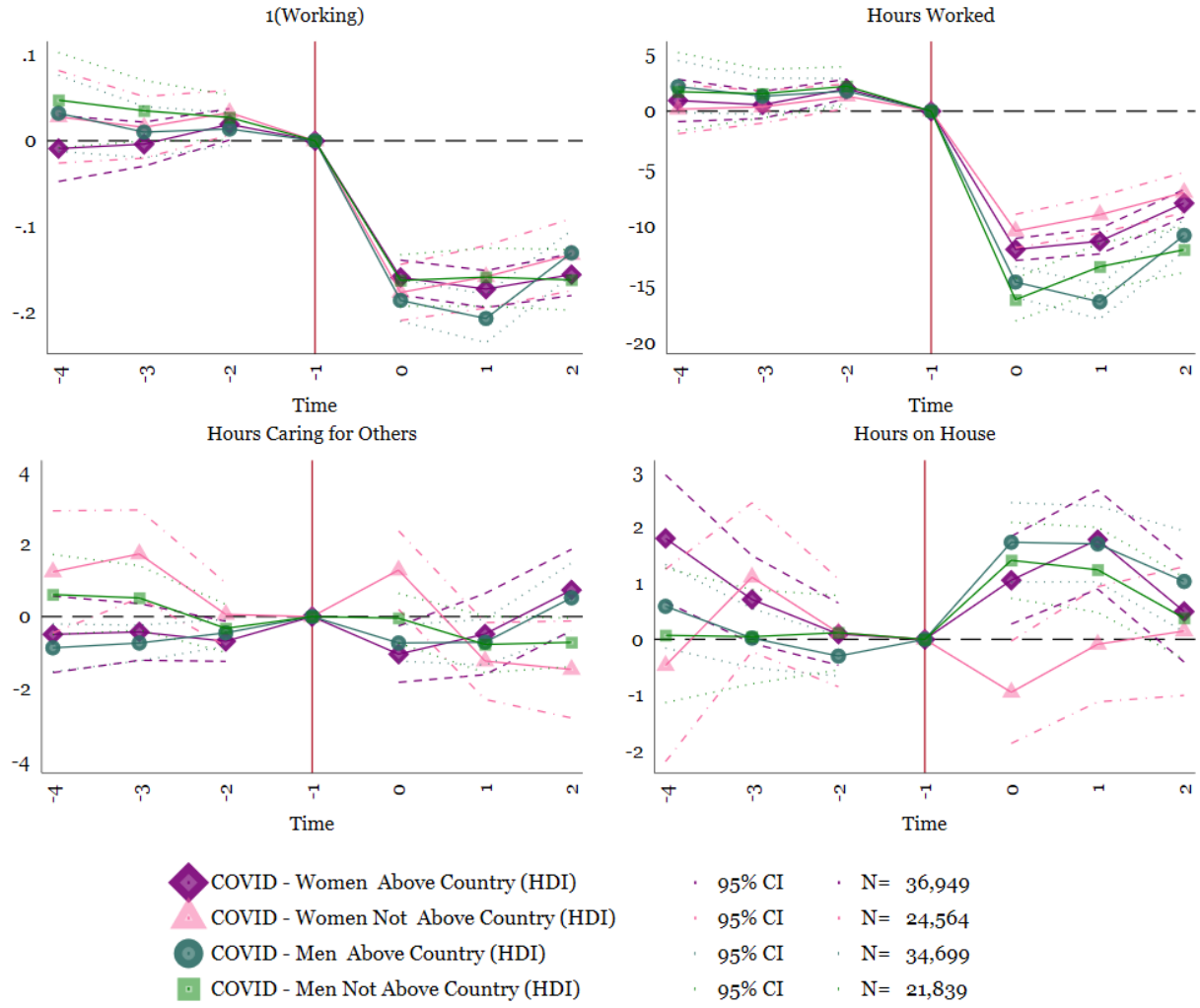
NOTES: OLS coefficients reported. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Figure B.5: Event Study: By High COVID Rate



NOTES: OLS coefficients reported. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Figure B.6: Event Study: By High HDI



NOTES: OLS coefficients reported. Baseline fixed effects include individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Robust standard errors are clustered at the individual level.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

C Alternative Specifications for Table 3

Table C.1: Post-Recession Labor Supply, Time Use, and Income – No Controls

Panel A: Women

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.166***	-9.040***	-0.041***	-11.125***	-0.125***	-7.660***	-0.863**	-0.575	-871.203***	-1.245***
	(0.014)	(0.611)	(0.011)	(1.023)	(0.012)	(1.279)	(0.392)	(0.413)	(139.543)	(0.133)
N	61,513	61,513	61,513	17,485	61,513	11,640	59,065	59,026	61,513	61,513
Adj R-sq	0.72	0.67	0.84	0.63	0.60	0.73	0.53	0.65	0.61	0.63
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X

Panel B: Men

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.188***	-15.008***	-0.061***	-11.664***	-0.126***	-9.802***	0.765***	-0.225	-1810.382***	-1.552***
	(0.014)	(0.810)	(0.014)	(0.929)	(0.018)	(1.125)	(0.256)	(0.243)	(193.988)	(0.139)
N	56,538	56,538	56,538	25,104	56,538	14,810	43,983	42,389	56,538	56,538
Adj R-sq	0.66	0.64	0.79	0.57	0.67	0.67	0.44	0.50	0.58	0.56
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table C.2: Post-Recession Labor Supply, Time Use, and Income – No Quarter FE

Panel A: Women

	1(Work-ing)	Hours Worked	1(For-mal)	Formal Hours	1(Infor-mal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.172***	-10.800***	-0.047***	-15.023***	-0.125***	-8.825***	0.164	-0.120	-939.589***	-1.167***
	(0.008)	(0.393)	(0.005)	(0.781)	(0.007)	(0.760)	(0.239)	(0.203)	(71.801)	(0.072)
N	61,513	61,513	61,513	17,485	61,513	11,640	59,065	59,026	61,513	61,513
Adj R-sq	0.72	0.68	0.84	0.66	0.60	0.73	0.53	0.65	0.61	0.64
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

Panel B: Men

	1(Work-ing)	Hours Worked	1(For-mal)	Formal Hours	1(Infor-mal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.181***	-15.385***	-0.059***	-13.780***	-0.122***	-10.093***	1.400***	-0.278**	-1708.382***	-1.527***
	(0.009)	(0.490)	(0.007)	(0.578)	(0.009)	(0.651)	(0.158)	(0.141)	(118.675)	(0.092)
N	56,538	56,538	56,538	25,104	56,538	14,810	43,983	42,389	56,538	56,538
Adj R-sq	0.66	0.65	0.79	0.58	0.68	0.69	0.45	0.51	0.59	0.57
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table C.3: Post-Recession Labor Supply, Time Use, and Income – No Individual FE

Panel A: Women

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.172***	-8.976***	-0.069***	-10.985***	-0.102***	-4.482***	0.274	0.942	-810.376***	-1.194***
	(0.019)	(0.831)	(0.018)	(1.140)	(0.016)	(1.417)	(0.435)	(0.657)	(167.095)	(0.160)
N	61,694	61,694	61,694	18,729	61,694	13,913	59,405	59,368	61,694	61,694
Adj R-sq	0.10	0.08	0.07	0.12	0.04	0.10	0.10	0.12	0.06	0.08
Quarter FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

Panel B: Men

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.156***	-12.934***	-0.111***	-9.913***	-0.044**	-8.303***	1.100***	0.318	-1597.194***	-1.067***
	(0.015)	(0.888)	(0.019)	(0.958)	(0.021)	(1.308)	(0.289)	(0.298)	(234.605)	(0.176)
N	56,733	56,733	56,733	26,772	56,733	16,840	45,179	43,764	56,733	56,733
Adj R-sq	0.11	0.08	0.06	0.07	0.05	0.12	0.05	0.08	0.05	0.06
Quarter FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Time trends for individuals are also included. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.

SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table C.4: Post-Recession Labor Supply, Time Use, and Income – Individual Trends

Panel A: Women

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.172***	-17.460***	-0.003	-32.604***	-0.169***	-16.600***	-0.253	2.137	-1060.272***	-1.041***
	(0.040)	(1.677)	(0.023)	(3.459)	(0.040)	(4.280)	(1.253)	(1.329)	(345.331)	(0.368)
N	61,513	61,513	61,513	17,485	61,513	11,640	59,065	59,026	61,513	61,513
Adj R-sq	0.79	0.77	0.88	0.75	0.69	0.82	0.61	0.73	0.67	0.72
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X
Individual Trends	X	X	X	X	X	X	X	X	X	X

Panel B: Men

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.216***	-25.121***	-0.015	-31.638***	-0.201***	-16.729***	3.180***	-0.631	-1660.114***	-1.466***
	(0.042)	(2.350)	(0.032)	(3.587)	(0.042)	(4.207)	(0.954)	(0.824)	(574.379)	(0.414)
N	56,538	56,538	56,538	25,104	56,538	14,810	43,983	42,389	56,538	56,538
Adj R-sq	0.74	0.74	0.83	0.68	0.75	0.75	0.55	0.63	0.67	0.66
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X
Individual Trends	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. Time trends for individuals are also included. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table C.5: Post-Recession Labor Supply, Time Use, and Income – Balanced Panel

Panel A: Women

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.203***	-12.157***	-0.018	-16.514***	-0.185***	-10.800***	-0.736	-0.422	-546.510**	-1.135***
	(0.026)	(1.227)	(0.018)	(2.164)	(0.029)	(1.912)	(0.801)	(0.642)	(255.550)	(0.234)
N	16,188	16,188	16,188	4,726	16,188	3,458	15,614	15,603	16,188	16,188
Adj R-sq	0.71	0.67	0.82	0.62	0.57	0.72	0.60	0.73	0.73	0.62
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

Panel B: Men

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.218***	-18.201***	-0.024	-15.600***	-0.194***	-9.007***	1.954***	0.666	-2213.029***	-1.881***
	(0.035)	(1.777)	(0.021)	(1.998)	(0.037)	(1.753)	(0.580)	(0.435)	(463.901)	(0.371)
N	14,347	14,347	14,347	6,761	14,347	3,934	11,277	10,848	14,347	14,347
Adj R-sq	0.67	0.62	0.80	0.59	0.64	0.69	0.44	0.61	0.58	0.60
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.
SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.

Table C.6: Post-Recession Labor Supply, Time Use, and Income – Households With Children

Panel A: Women

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.112***	-10.388***	-0.046***	-18.519***	-0.066***	-6.146***	-1.342*	-0.483	-832.754***	-0.907***
	(0.028)	(1.257)	(0.017)	(1.948)	(0.025)	(2.305)	(0.770)	(0.822)	(231.231)	(0.260)
N	29,391	29,391	29,391	8,040	29,391	5,663	28,448	28,427	29,391	29,391
Adj R-sq	0.708	0.669	0.834	0.651	0.575	0.741	0.526	0.610	0.661	0.659
Pre Mean Dep	0.557	19.985	0.254	41.480	0.303	31.205	21.643	11.066	2,582.106	3.548
Post Mean Dep	0.397	11.244	0.197	28.185	0.200	28.429	22.826	12.141	1,763.608	2.500
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

Panel B: Men

	1(Working)	Hours Worked	1(Formal)	Formal Hours	1(Informal)	Informal Hours	Hours House	Hours Caring	Income	Log of Income+1
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Post x 1(COVID)	-0.210***	-20.255***	-0.048*	-18.473***	-0.162***	-13.944***	1.612***	-0.560	-2445.935***	-2.038***
	(0.029)	(1.695)	(0.025)	(1.868)	(0.037)	(2.223)	(0.481)	(0.666)	(396.198)	(0.300)
N	25,201	25,201	25,201	12,016	25,201	6,860	19,288	18,513	25,201	25,201
Adj R-sq	0.648	0.654	0.797	0.644	0.684	0.682	0.494	0.494	0.559	0.555
Pre Mean Dep	0.872	40.942	0.473	47.977	0.399	45.757	5.475	4.287	5,536.737	5.634
Post Mean Dep	0.732	26.347	0.364	36.354	0.368	35.590	7.381	4.382	3,745.044	4.594
Quarter FE	X	X	X	X	X	X	X	X	X	X
Individual FE	X	X	X	X	X	X	X	X	X	X
Controls	X	X	X	X	X	X	X	X	X	X

NOTES: OLS coefficients reported. The coefficient indicates the post-recession period for the COVID-19 pandemic recession. Baseline fixed effects include quarter fixed effects and individual fixed effects. Controls include indicators for the number of individuals in the household and indicators for the age of the individual. The main sample includes individuals who are 18 to 64. Robust standard errors are clustered at the individual level and are reported in parentheses. ***, **, * represent statistical significance at 1, 5 and 10 percent levels.

SOURCE: Individual-level data from the National Occupation and Employment Survey (ENOE) 2019-2020Q1. The ENOE transitioned to the ETOE telephone survey in April-June 2020.