Labor Markets in Crisis: The Double Liability of Low-Wage Work During COVID-19

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We adopt a novel identification strategy to examine the heterogeneous effects of Canada’s COVID-19 economic shutdown on hours worked across the earnings distribution. Early labor-market analyses found that workers in the bottom of the earnings distribution experienced a much larger reduction in hours worked than workers in the top of the earnings distribution. Our analysis reveals a double liability of low-wage work during Canada’s COVID-19 economic shutdown: while workers in every quintile experienced a large reduction in hours on average, significant increases in hours were only present among workers in the bottom quintile. Implications for crisis income supports are discussed.

Introduction

On March 11, 2020, the World Health Organization (WHO) classified the novel coronavirus disease (COVID-19) as a pandemic. The virus had led to rising death tolls in countries such as China and Italy and was generating major concern among policymakers in North America. In an effort to “flatten the curve,” protect vulnerable populations, and prevent health-care systems from becoming overwhelmed, governments in Canada introduced extensive and unprecedented public health restrictions.

All Canadian provincial and territorial governments declared a public health and/or state of emergency between March 13 and 20, apart from the small jurisdictions of Nova Scotia and the Yukon, which declared states of...
emergency on March 22 and 27, respectively (Dawson 2020). The two largest provinces, Quebec and Ontario, declared the mandatory closure of non-essential businesses on March 24 (Stone, Van Praet, and Gray 2020), though due to earlier government signals many organizations had already voluntarily closed down by that date or had most staff working from home (Jones 2020). Canada’s border with the United States was shut down on March 20.

These government interventions wreaked havoc on labor markets. One million unemployment insurance claims were filed the week of March 16, representing 5 percent of all employees in the country (Parkinson and O’Kane 2020). The aggregate workings hours lost between February and March 2020 was the largest month-over-month decrease since 1997, while the unemployment rate increase was the largest one-month spike since 1976 (which is as far back as comparable labor-market statistics on both measures are available; Statistics Canada 2020a). The unemployment rate increased by 2.2 percentage points between February and March to 7.8 percent, while the employment rate decreased by 3.3 percentage points to 58.5 percent (Statistics Canada 2020a). By April—the worst month of the pandemic shutdown in Canada—the unemployment rate was estimated at 17.8 percent when including those who were unemployed as well as those who had worked recently and wanted a job but did not search for work (Statistics Canada 2020b). Lemieux et al. (2020), using seasonally adjusted comparisons of changes in monthly aggregate labor statistics, documented “a 32 percent decline in aggregate weekly hours worked between February and April 2020 and a 15 percent decline in employment” (S56). They also note that Canada’s lowest earners experienced the greatest job and hour losses.

While many low-earning workers did experience unprecedented job and hour losses during the COVID-19 crisis, aggregate (i.e., net) labor-market statistics mask important sources of heterogeneity that exist among workers in the bottom of the earnings distribution. For instance, anecdotal evidence suggests that some low earners worked more during the pandemic (e.g., Blackwell 2020) given that many of their jobs were deemed essential (e.g., grocery store clerks, personal support workers). In addition, low earners are more likely to work in jobs that are customer facing and could not be performed at home. For example, early analyses suggested that roughly 37 percent of U.S. jobs and 40 percent of Canadian jobs could be performed entirely from home, and that high earners were disproportionally represented among the workers employed in these jobs (Dingel and Neiman 2020; Messacar, Morissette, and Deng 2020). This raises the possibility that workers in the bottom part of the earnings distribution faced a double liability during the pandemic. That is, compared to high earners, low-earning workers were either disproportionally likely to lose their jobs (or most of their hours), or, if they retained their jobs,
were more likely to have greater exposure to the virus via work that could not be performed remotely.

In this article, we adopt a novel identification strategy to obtain the effect of Canada’s COVID-19 economic shutdowns on the hours worked of individuals. We focus our analysis on April 2020, as it was the worst month of the shutdowns in Canada in terms of labor-market impacts. We use the monthly cross-sectional public-use microdata files from Statistics Canada’s Labour Force Survey (LFS), which include information on both actual and usual hours worked for each respondent in a given month, as well as usual wages. Our empirical strategy involves comparing actual hours worked during the pandemic to usual hours worked for each individual. We show that, while reported actual hours were impacted by the economic shutdowns in April, reported usual hours were not. We also show that usual and actual hours tracked each other closely prior to the pandemic. Using this approach, we are able to obtain the individual treatment effect of COVID-19 on hours worked, as each worker’s usual hours acts as a counterfactual measure of their labor supply in the absence of the COVID-19 pandemic.

However, because the difference between the “treated” outcome (actual hours worked) and “control” outcome (usual hours worked) does not account for normal monthly differences between actual and usual hours worked, nor for seasonality, we use a triple-difference estimation strategy. To account for normal differences across workers’ usual and actual hours, we use data from February 2020 (pre-shutdown) and April 2020 (post-shutdown). We also use data from February 2019 and April 2019 to account for seasonal differences between actual and usual hours worked.

Our empirical method enables us to explore unique heterogeneity in labor-market impacts on various dimensions. First, by observing both usual and actual hours for each worker, we are able to condition our results on those working more or less than usual during the crisis. Second, we use reported hourly wages to examine the impacts of the economic crisis across the earnings distribution. We replicate prior findings of a major net loss in hours for the lowest-earning workers. However, we also find that, among workers who remained employed during the pandemic, some of the lowest earners experienced a statistically and economically significant increase in their weekly working hours.

Our article provides several contributions to the literature. First, no study to date has examined the extent to which the lowest earners worked more during the pandemic. Second, to our knowledge, this is the first empirical labor-market article to present a within-individual estimate using repeated cross-sectional data. As such, we provide a methodological innovation that researchers seeking appropriate control groups in other labor-market contexts may find useful. Third, while existing studies have reported aggregated descriptive statistics of changes
in monthly labor-market indicators over time by earnings groups (e.g., Lemieux et al. 2020), our approach allows us to document whether changes in hours for individuals across the earnings distribution are significantly different from each other. Finally, our findings have important implications for the design and evaluation of crisis income support programs. For instance, workers were unable to voluntarily quit their jobs to access Canada’s main crisis income support program—the Canada Emergency Response Benefit (CERB). This effectively limited options for workers who may have been required by their employers to remain on the front lines to provide the public with essential goods and services during the peak of the pandemic, and who still required an income to meet basic needs. The double liability presented in this article thus suggests that policies like the unconditional transfer provided by the U.S. federal government early in the pandemic may have been a more equitable approach to address the labor-market challenges facing workers in the bottom of the earnings distribution.

Theoretical Considerations

COVID-19 and the labor market: underlying mechanisms. The COVID-19 pandemic impacted workers’ hours via direct and indirect channels. The crisis had a direct impact by causing workers (and/or their family members) to fall ill, which in turn reduced their hours worked or discontinued employment as they were required to stay home due to illness or caregiving responsibilities. Second, it had an indirect impact via government public health interventions that attempted to slow community transmission, including physical distancing requirements and the closure of non-essential businesses and other segments of the economy, which led to layoffs and working hour reductions. The closure of schools and daycares may have also required some workers to reduce their working hours to care for children. These direct and indirect channels have opposing effects: as government-imposed public-health restrictions increased, fewer workers fell ill than otherwise would have (at least in the short term—hence “flattening” the curve). The indirect channel of government intervention, through widespread economic and business shutdowns, had a much larger impact on the labor market early in the crisis than the direct channel (i.e., illness).

New classes of workers. While most analyses have (understandably) focused on the unprecedented job and hour losses resulting from the COVID-19 economic shutdowns, these aggregate labor-market statistics mask important sources of variation for understanding the full extent of the shutdown across workers. We propose that the physical distancing rules and business closures imposed by governments generated three new classes of workers,
including individuals who: (1) lost their job, (2) were able to continue working mostly or exclusively from home, and (3) continued to work mostly or exclusively outside the home.

Among these new classes of workers, prior analyses suggest that the first class of workers—that is, those experiencing job and hour losses—are more likely to be female, young, working part time, less educated, and have low-earnings (Bélard, Fakorede, and Mikola 2020; Lemieux et al. 2020; Macdonald 2020; Statistics Canada 2020a, 2020b). As previously noted, higher earners are disproportionately represented among the workers employed in the second class of jobs that can be performed from home (Dingel and Neiman 2020; Messacar, Morissette, and Deng 2020).

The third class of workers, who continued to work mostly or exclusively outside the home during the shutdown, are disproportionately employed in frontline industries and occupations in health care, transit, and food production/retail, where the risk of regular exposure to COVID-19 was much higher than for the other two classes of workers (e.g., Bélard, Brodeur, and Wright 2020). Paradoxically, some of these essential workers are employed in the lowest-paid occupations, and yet they may have experienced an increase in their normal hours of work during the crisis due to the essential nature of the work they perform. For instance, in the United States, janitors and building cleaners experienced strong employment growth in March (Cortes 2020) and frontline essential retail jobs did not experience the same decline in labor demand (measured by job postings) as most other occupations (Forsythe et al. 2020).

Taken together, the theoretical considerations and research outlined in this section suggest that we should empirically observe workers (both inside and outside the home) falling into one of the following three groups: those who are: (1) working less than usual, (2) working the same as usual, and (3) working more than usual. To test this theory, in addition to examining the overall or net impact of the crisis on workers across the earnings distribution (in line with prior studies), we therefore also condition our results on whether respondents worked more or less than usual.

Data

For our main results, we use the February and April 2019 and 2020 public-use microdata files from Statistics Canada’s LFS, which is the primary dataset used by academics and governments to understand the Canadian labor market. The LFS is a monthly household survey that provides labor-supply information on working-age individuals (15 years and older) across Canada. The LFS adopts a 6-month rotating panel design, meaning that selected households are
followed for six consecutive months (though individuals cannot be linked across time in the public use files). Every month, approximately one sixth of the sample is dropped as new households are added.

We focus on the effects of COVID-19 in April, as April 2020 represents the worst of the labor-market impacts of the shutdowns in Canada. We exclude the following groups of individuals from our sample: self-employed workers (see Bélard, Fakorede, and Mikola 2020 for research on the impact of COVID-19 on self-employed workers in Canada), unpaid family workers, and individuals who have never worked. We also exclude respondents who may not have worked their usual hours for reasons unrelated to the COVID-19 labor-market crisis—for example, individuals who were employed but partially or fully absent from work during the survey reference week because of a vacation.

We also exclude respondents who were absent from work for more than 6 weeks in April or without a job for more than 2 months in April. Because these individuals were not working at least 2 weeks prior to the start of the COVID-19 shutdowns in mid-March, their hours were less likely to have been directly impacted by the economic shutdowns (noting, however, that their employment or job search may have been).

Our main labor-market outcome is a continuous measure of individuals’ hours worked at the main job during the LFS reference week. We use two measures of hours worked to identify the effect of COVID-19 on Canada’s labor market: usual weekly hours and actual weekly hours. We determine whether individuals are working more or less than usual by subtracting their usual hours from actual hours. A positive (negative) difference between these two measures indicates that a particular individual is working more (less) than usual.

To examine the effects across the earnings distribution, for each individual we generate a measure of “usual” weekly earnings by multiplying each respondent’s usual hours worked in their main job by their reported usual wage. We use earnings rather than hourly wages to define income classes as the former accounts for the number of hours that each individual works in a typical week. Using usual earnings in February 2020, we then compute earnings quintiles. The earnings thresholds from the quintiles in February 2020 are used to define the quintiles in April 2020 and for both months in 2019. We do this to avoid changes in the earnings thresholds triggered by the shutdown.

In the LFS, actual hours worked, usual hours worked, and usual wages are only observed for workers (both those who are employed and at work, and those who are employed but absent from work). These variables are not observed for unemployed individuals, nor for labor market non-participants (we refer to these groups of individuals as “nonworkers” hereafter). Given that many workers lost their jobs due to the economic shutdowns and/or were
discouraged from job search during the pandemic, omitting these individuals from our analyses would lead to underestimates of the effect of the shutdowns on hours worked.

To include nonworkers in our sample, we set their actual hours to zero, and compute usual hours and wages using multiple imputation, a missing data technique used frequently in the social science literature and developed based on principles in Rubin (1987) and Schafer (1997). In our case, usual hours worked and hourly wages for nonworkers can be thought of as missing data conditional on labor-force status (i.e., missing at random). We carry out the imputation using the \textit{mi} impute function in Stata. We employ chained iterations and predictive mean matching using the five closest neighbors. We generate twenty datasets and use the following variables to inform the imputation: labor-force status, province, age group, marital status, highest level of educational attainment, class of employment (i.e., public or private), immigrant status, industry, occupation, and age of youngest child in the household. In addition to using the aforementioned variables, we also impute usual hours worked and hourly wages separately within months, years, gender, and employment status (i.e., full or part time). For example, we separately impute usual hours worked for full-time men in April 2020, part-time men in April 2020, full-time men in April 2019, part-time men in April 2019, and so on. Estimates from the twenty datasets are then pooled with the \textit{mi} estimate prefix in Stata using the identification strategy described below.

Design and Methods

\textit{Identification strategy.} Our identification strategy exploits the introduction of government-enforced public health restrictions and mandated business shutdowns that began in mid-March 2020. Prior studies examining the labor-market effects of COVID-19 compare actual hours worked in February 2020 to post-pandemic months or actual hours worked in post-pandemic months to the same months in a prior year (e.g., Lemieux et al. 2020; Statistics Canada 2020a, 2020b). These approaches are useful for understanding the unprecedented nature of the COVID-19 shutdowns. However, it is not our preferred approach for obtaining the heterogeneous causal impact of the COVID-19 shutdowns on the labor market because actual hours is a noisier measure than usual hours, and comparing actual hours across time is susceptible to both time-varying and time-invariant confounds. Our approach is only subject to the former.

As previously outlined, provincial COVID-19 restrictions and shutdowns were all undertaken within a few weeks in mid-to-late March. The shutdown
therefore represents a nationwide exogenous shock to Canada’s labor market, making it difficult to obtain a suitable control or counterfactual group. To overcome this problem, we exploit the fact that respondents report both their usual and actual hours of work in any given month of the LFS and propose that the usual hours worked of each respondent, particularly early on in the pandemic, provides an ideal counterfactual measure of labor supply for each respondent in the absence of COVID-19 (i.e., what they would have worked in the absence of the crisis).

In other words, for each individual, we simultaneously observe labor supply in parallel worlds in which: (1) COVID-19 occurs (actual hours worked for individual i in April 2020) and (2) COVID-19 does not occur (usual hours worked for individual i in April 2020). To emphasize, we observe both of these worlds for the exact same worker at the same point in time. In this sense, each “treated” worker simultaneously acts as their own control (thus removing any time-invariant confounds). We take the average difference between actual and usual hours worked to determine the average causal effect of the crisis shutdowns on hours worked.

Estimation. To employ this identification strategy, we reshape the monthly cross-sectional LFS data so that we have one “hours worked” variable and two observations for each respondent: the first observation captures usual hours worked, while the second observation captures actual hours worked. Therefore, within a particular month and year for each individual, the values on all other variables across the two observations are identical.

We also account for differences between usual and actual hours worked that existed prior to the COVID-19 pandemic. Figure 1 shows that there are normal differences in average usual hours worked and average actual hours worked. To partial out these normal differences, we thus also use data on workers’ usual and actual hours from February 2020, as well as from the same months in 2019 to account for seasonality. More specifically, we identify the causal effect of the COVID-19 shutdowns by comparing the difference between usual and actual hours worked for each individual’s main job, in February and April, and in 2019 and 2020. This provides our triple-difference estimator, which is shown in equation (1):

\[ \text{Equation (1)} \]

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1 Due to COVID-19 shutdowns, we were unable to access private-use data from Statistics Canada’s Research Data Centers, which would provide a panel of individuals across 6 months. If we had access to the private-use data, an alternative design would be to use within-worker variation in the difference between usual and actual hours worked over time to identify the effect. However, because respondents are only in the panel for 6 months, it would not be possible to partial out the seasonal effect using this alternative design.
FIGURE 1
PARALLEL TRENDS: AVERAGE ACTUAL WEEKLY HOURS AND AVERAGE USUAL WEEKLY HOURS, EMPLOYED RESPONDENTS, JANUARY 2018–OCTOBER 2020

Panel 1.A: All Workers

Panel 1.B: Respondents Working More Than Usual

Panel 1.C: Respondents Working Less Than Usual
The outcome variable $Y_{int}$ captures hours worked for individual $i$ in month $m$ and year $t$. $Treatment_i$ is an indicator for whether actual hours (treatment) or usual hours (control) is observed for each individual (i.e., actual hours = 1; usual hours = 0). $PostCOVID_m$ is an indicator for whether the worker is observed after the start of the pandemic (i.e., April = 1; February = 0), and $COVIDYear_t$ is an indicator for whether the worker is observed in the crisis year (i.e., 2020 = 1; 2019 = 0). $Treatment_i \times PostCOVID_m \times COVIDYear_t$ is an interaction term indicating that a worker’s actual hours are observed in April 2020. In equation (1), $\delta$ can therefore be interpreted as the causal effect of the COVID-19 economic shutdowns on hours worked, subject to the validity of our identifying assumptions (examined in the next section).

Equation (1) is estimated overall and for two subsamples of workers—those who are working more hours than usual and those who are working fewer hours than usual. For each of these three samples, equation (1) is also estimated separately for each quintile, for a total of eighteen different regressions. We will estimate these regressions separately using the sample of workers only (see Table 5) and for the sample of workers and nonworkers (see Table 6), where usual hours worked and usual hourly wages have been imputed for non-workers. For non-workers, earnings are constructed using the imputed usual hours and usual hourly wages variables.

Table 7 will adopt a four-way interaction term to explore whether the differences in the hour losses between the bottom quintile and other earnings groups are statistically significant. For instance, the difference between the bottom and second quintile is estimated by equation (2):

$$Y_{inte} = \alpha + \delta Treatment_i \times PostCOVID_m \times COVIDYear_t \times Second_e + \gamma Treatment_i + \beta PostCOVID_m + \zeta COVIDYear_t + \sigma Treatment_i \times PostCOVID_m + \theta PostCOVID_m \times COVIDYear_t + \rho Treatment_i \times COVIDYear_t + \eta Treatment_i \times Second_e + \mu PostCOVID_m \times Second_e + \pi COVIDYear_t \times Second_e + \epsilon_{inte}. \quad (2)$$

All of the variables in equation (2) are identical to those in equation (1), apart from the addition of $Second_e$, which is an indicator for whether individual $i$ is in the second quintile (i.e., second quintile = 1; bottom quintile = 0). In equation (2), $\delta$ can be interpreted as the differential effect of the COVID-19 shutdowns on hours worked between the bottom and second quintile. A
significant coefficient for $\delta$ indicates that the shutdowns impacted workers in the bottom and second quintiles differently. For the remaining quintiles, simply replace $Second_e$ in equation (2) with Middle, Fourth, and Top.

To account for the fact that individual observations are not independently and identically distributed, we cluster-adjust standard errors at the individual level. Additionally, in all of our empirical results, we use the weights assigned to respondents based on the LFS sampling design, though we report the unweighted sample sizes. Our results are estimated using ordinary least squares (OLS), noting that employed individuals with zero hours worked remain in the overall sample as well as in the subsample of individuals working less than usual.

To illustrate our unique identification and estimation strategy, Table 1 presents an example using LFS data from workers in the bottom of the earnings distribution in February and April 2020 and February and April 2019. To obtain the causal effect, first take the difference between average actual and average usual hours worked by respondents in both April ($−5.64$) and February ($−0.477$) in 2020, then do the same for 2019. Next, take the difference of the differences between February and April in both 2019 and 2020. Finally, taking the difference of the double-differences between 2019 and 2020, the results suggest that the COVID-19 economic shutdowns reduced hours worked by 5.1 hours on average for the lowest earning workers. (This result is identical to the triple-difference estimate that is reported in the second column and first row of our main results, presented in Table 5.)

**Parallel trends assumption.** A key assumption of our identification strategy is that the change in workers’ actual hours would have been the same as

### Table 1

|          | 2019 Average | 2020 Average | Triple Difference |
|----------|--------------|--------------|-------------------|
| April    | Actual hours (treatment) | 18.271 | 14.398 | $−0.031$ |
| February | Actual hours (control)    | 18.741 | 19.016 | $−0.714$ |
| Difference | Difference          | $−0.47$ | $−0.745$ | $−0.031$ |

Notes: Averages are computed using LFS survey weights. Sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday, (3) employed individuals who have been absent from work for more than 6 weeks, and (4) unpaid family workers.

Source: Canadian Labour Force Survey, 2019–2020.
the change in workers’ usual hours in the absence of the government interventions (i.e., the parallel trends assumption). Figure 1 plots average actual (treatment) and average usual (control) hours worked for workers between January 2018 and October 2020 for: (1) the full sample (panel 1.A), (2) respondents working more than usual (panel 1.B), and (3) respondents working less than usual (panel 1.C). It is clear in Figure 1 that the pre-treatment trend lines between usual (control) and actual (treatment) hours are virtually identical prior to the COVID-19 intervention.

Covariate balance assumption. The public-use LFS data do not allow researchers to identify individuals over time, and thus our triple-difference strategy uses repeated cross-sections of workers over time. One of the concerns of repeated cross-sections is that the demographic composition and characteristics of workers across the earnings distribution may have changed as a result of the COVID-19 economic shutdown, introducing an important source of omitted variable bias caused by time-varying unobservable covariates (see Cunningham 2020, 274–75). This is a major limitation of existing studies that rely exclusively on prior time periods to estimate the effect of COVID-19 on labor markets.

One benefit of using the LFS is that the 6-month rotating panel sampling strategy employed by Statistics Canada means that, in each year, approximately four sixths of the sample consists of the same workers between February and April. In addition, new households are selected using a stratified sampling strategy that is unrelated to the treatment (i.e., COVID-19 shutdowns).

What matters most for the validity of our design, however, is that “differences between the treatment and control groups are stable over time and that the changes in treatment exposure are not associated with changes in the distribution of covariates” (Wing, Simon, and Bello-Gomez 2018: 460). Because actual and usual hours worked are collected from the same worker in any given month, the distribution of covariates (i.e., individual characteristics) between our treatment and control groups are identical prior to (and after) treatment exposure, by construction. As a verification, when we run covariate balance regressions by replacing the outcome variable with a number of different covariates in our triple-difference regression model expressed by equation (1), the estimates for $\delta$ are all zero. We also estimate equation (1) including several sociodemographic controls and our estimates do not change.

Stable unit treatment value assumption. Our identification strategy may be problematic if the stable unit treatment value assumption (SUTVA) is violated. For instance, after the first month of the pandemic, respondents may have been
more likely to report changes to usual hours worked that reflect the new realities of the post-COVID-19 shutdown, in which case the usual hours of work reported by respondents in the April survey may not reflect pre-crisis usual hours of work. Our empirical design becomes less compelling if this is the case. Additionally, because our measure of earnings is computed using usual hours worked and usual wages, the results of our analysis examining the impacts of the crisis across the earnings distribution could also be affected by a SUTVA violation.

Empirically, these types of SUTVA violations do not appear to be happening. As shown in Figure 1, reported usual hours in the post–COVID-19 period (i.e., the months to the right of the vertical line) continue to track pre-crisis usual hours for several months post-February, suggesting that workers considered the shutdowns to be short term—at least in the early months of the pandemic.

Moreover, while we would expect COVID-19 to reduce workers’ reported usual hours over time in the case of a SUTVA violation, when we examine hours trends by quintiles (see Figure A1 in Appendix A), we actually observe that the average usual reported hours for workers in the bottom quintile shows a slight increase post-treatment. Because respondents outside of the bottom quintile have not updated their usual hours worked at all, the most likely explanation for the small uptick in average usual hours at the bottom is that part-time workers were more likely to lose their jobs as a result of the COVID-19 economic shutdown (Statistics Canada 2020b); as such, the workers who remain in our employed sample in April are slightly more likely to be employed full time (and thus report higher usual working hours). In other words, the small uptick among workers in the bottom of the earnings distribution is due to compositional changes rather than workers updating their reported usual hours. As described above, this type of compositional change is not problematic for estimating unbiased results using our identification strategy. This is because the compositional change does not produce differences in the distribution of covariates between our control (usual hours) and treatment (actual hours), as these measures are both obtained from the same respondent. We also check whether usual wages remain stable over time and similarly find that, within each quintile, there is no post-crisis change in reported usual hourly wages (see Figure B1 in Appendix B).

**Behavioral responses to crisis supports.** An additional problem with identifying the causal effect of the shutdowns is that several federal crisis income support policies were also announced in the weeks and months that followed the start of the pandemic. As such, any effect identified could potentially capture both the effects of the shutdown as well as any behavioral responses to
the crisis income support policies that were designed to mitigate the impact of the shutdown on workers and businesses. However, given the timing of the introduction and implementation of these programs, the behavioral effects associated with government support policies in Canada still would have remained fairly weak in mid-April and become more pronounced in the later months of the pandemic.

Empirical Results

Descriptive statistics. Tables 2 and 3 display the summary statistics for workers who were employed in February and April 2020 by weekly earnings quintile (quintiles are defined using the earnings thresholds from February 2020). As the first row in both tables indicates, individuals in the bottom quintile work far fewer usual hours on average than individuals in other quintiles; they work about half of the hours of workers in the second quintile. This difference most likely captures the fact that individuals in the bottom quintile are much more likely to work part time: in February 2020, only 18 percent of individuals in the bottom quintile had full-time employment status, compared to 99 percent of individuals in the top quintile. In April, the proportions of full-time workers in the bottom and top quintiles increased to 21 percent and 100 percent, respectively. This is consistent with the fact that part-time workers were more likely to lose their jobs during the crisis (Statistics Canada 2020b). In both months, workers in the bottom quintile were also less likely to have a permanent job or to be paid for time off than workers in other quintiles.

By definition, average wages increase across the quintiles in both months. The average hourly wage in February is $15.99 for individuals in the first quintile, while individuals in the fourth and fifth quintiles earned $32.87 and $50.61, respectively. There are notable differences in terms of the types of workers across quintiles. While the majority of individuals are employed in the private sector, the likelihood of working in the private sector decreases as weekly earnings increase. For example, in February there is a 25-point difference between the bottom and top quintiles in terms of the proportion of individuals who are employed in the public sector. Individuals in higher quintiles are also more likely to have union representation, though the proportion of those in the bottom with union representation increased by 5 percentage points from February to April 2020, consistent with the fact that unionized workers were less likely to lose their jobs in the pandemic shutdowns (Statistics Canada 2020b).
Table 2 also reveals that, as earnings increase, the proportion of women decreases: 62 percent of individuals in the bottom quintile are women, compared to only 35 percent of individuals in the top quintile. There are also notable differences in marital status and parental status across the quintiles. For example, only 37 percent of individuals in the bottom quintile are married or...
in a common-law relationship and only 15 percent have children under 18 years old. Compare this to workers in the top quintile, in which 78 percent are married, and 45 percent have children under 18 years old. These differences reflect the fact that individuals at the bottom of the distribution tend to be younger than those at the top.

| Weekly earnings quintile | Bottom  | Second | Middle | Fourth | Top    |
|-------------------------|---------|--------|--------|--------|--------|
| Average usual hours     | 20.04   | 36.17  | 38.12  | 39.04  | 40.49  |
| Average actual hours    | 14.40   | 28.36  | 32.18  | 35.29  | 38.65  |
| Average hourly wage     | $16.25  | $18.58 | $24.45 | $33.06 | $51.06 |
| Average job tenure (months) | 48.45 | 66.84  | 89.91  | 102.58 | 118.08 |
| Full-time employment    | 0.21    | 0.88   | 0.96   | 0.98   | 1.00   |
| Public (ref: private)   | 0.14    | 0.16   | 0.24   | 0.32   | 0.36   |
| Union                   | 0.21    | 0.25   | 0.35   | 0.39   | 0.35   |
| Multiple job holders    | 0.05    | 0.04   | 0.03   | 0.03   | 0.03   |
| Permanent job           | 0.74    | 0.88   | 0.90   | 0.94   | 0.96   |
| Paid for time off       | 0.12    | 0.18   | 0.32   | 0.47   | 0.47   |
| Low education           | 0.42    | 0.33   | 0.25   | 0.17   | 0.10   |
| Student                 | 0.65    | 0.95   | 0.97   | 0.97   | 0.98   |
| Non-student             | 0.31    | 0.04   | 0.01   | 0.01   | 0.00   |
| Full time               | 0.04    | 0.01   | 0.01   | 0.02   | 0.02   |
| Part time               | 0.23    | 0.30   | 0.26   | 0.22   | 0.25   |
| Immigrant               | 0.61    | 0.56   | 0.52   | 0.43   | 0.34   |
| Female                  | 0.39    | 0.55   | 0.63   | 0.70   | 0.79   |
| Married (ref: single)   | 0.81    | 0.69   | 0.64   | 0.55   | 0.45   |
| None                    | 0.06    | 0.10   | 0.12   | 0.16   | 0.18   |
| Youngest child <6       | 0.05    | 0.09   | 0.11   | 0.13   | 0.17   |
| Youngest child 6–12     | 0.04    | 0.06   | 0.06   | 0.08   | 0.10   |
| Youngest child 13–17    | 0.04    | 0.06   | 0.07   | 0.08   | 0.10   |
| Youngest child 18–24    | 0.42    | 0.17   | 0.09   | 0.03   | 0.01   |
| Age group               | 0.15    | 0.26   | 0.28   | 0.29   | 0.19   |
| Age 15–19               | 0.10    | 0.19   | 0.23   | 0.27   | 0.30   |
| Age 25–34               | 0.11    | 0.18   | 0.21   | 0.24   | 0.30   |
| Age 35–44               | 0.13    | 0.17   | 0.17   | 0.15   | 0.18   |
| Age 45–54               | 0.09    | 0.04   | 0.03   | 0.01   | 0.02   |
| Age 55–64               | 0.09    | 0.04   | 0.03   | 0.01   | 0.02   |
| N                       | 5193    | 5989   | 6600   | 6916   | 7071   |

Notes: Summary statistics are computed with LFS survey weights. Unweighted sample sizes reported.

*Full-week absences only.; *Low education includes individuals who have post-secondary education or less.; *Married includes common-law relationships. Proportions may not sum to 1 due to rounding. Sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday, (3) employed individuals who have been absent from work for more than 6 weeks, and (4) unpaid family workers.

Source: Canadian Labour Force Survey, 2020.
Last, Tables 2 and 3 indicate that individuals in the bottom quintile have much lower levels of education and are much more likely to be students than individuals in any of the other four quintiles. Immigrant status does not vary much across the earnings distribution, with the exception of a higher proportion of immigrants in the second quintile relative to the other quintiles in both months. Note that the public-use LFS microfiles do not contain a race variable.

Table 4 presents the proportion of individuals working the same, more, and less than usual by quintile and month. Between February and April, the proportion of individuals working the same as usual decreased by 10 percentage points. However, there is substantial variation in this change across earnings quintiles: the proportion of individuals in the bottom quintile working the same as usual decreased by 21 percentage points, compared to no decline among those in the top earnings quintile. There is also notable variation across all quintiles in terms of working more and less and a considerable portion of individuals worked more than usual post-pandemic.

**Triple-difference estimates.** As previously outlined, our identification strategy involves taking the difference between usual and actual hours worked between February and April in 2019 and 2020. Table 5 displays the triple-difference results of equation (1) for the worker-only sample. Table 6 presents the results that include the imputed non-worker sample. Table 7 shows

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**Table 4**

| Weekly earnings quintile | Overall | Bottom | Second | Middle | Fourth | Top |
|--------------------------|---------|--------|--------|--------|--------|-----|
| Panel A: Individuals working the same as usual |         |        |        |        |        |     |
| February                 | 0.62    | 0.59   | 0.69   | 0.67   | 0.61   | 0.56|
| April                    | 0.52    | 0.38   | 0.51   | 0.57   | 0.55   | 0.56|
| Panel B: Individuals working more than usual |         |        |        |        |        |     |
| February                 | 0.21    | 0.17   | 0.15   | 0.19   | 0.24   | 0.30|
| April                    | 0.18    | 0.16   | 0.13   | 0.14   | 0.20   | 0.24|
| Panel C: Individuals working less than usual |         |        |        |        |        |     |
| February                 | 0.50    | 0.23   | 0.16   | 0.15   | 0.15   | 0.14|
| April                    | 0.67    | 0.47   | 0.36   | 0.29   | 0.25   | 0.21|

*Notes:* Summary statistics are computed with LFS survey weights. Unweighted sample sizes reported. Proportions may not sum to 1 due to rounding. Sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday, (3) employed individuals who have been absent from work for more than 6 weeks, and (4) unpaid family workers.

*Source:* Canadian Labour Force Survey, 2020.
whether the observed differences between the bottom quintile and other earnings groups in Tables 5 and 6 are statistically significant.

In addition to the absolute change in hours worked, in Tables 5 and 6, we also report percentage changes, as the latter provides important context by revealing the relative effect of the crisis on workers across the earnings distribution. For instance, workers in the bottom of the earnings distribution were more likely to work part time pre-crisis and work fewer hours on average compared to workers in the top of the earnings distribution (see Table 2). To compute percentage changes, we divide the regression coefficients by the average actual hours worked for workers in February 2020.

Panel A of Table 5 highlights that, overall, in April, the COVID-19 economic shutdowns had a significant negative effect on hours worked. Within the sample of employed workers, on net, there was an average reduction of 3.9 hours during the reference week. Across the quintiles, on net, higher earners experienced smaller reductions in working hours, both in absolute terms and as a percentage of their pre-crisis hours. For instance, the hours of
individuals in the bottom quintile were reduced by 5.1 hours on average (28 percent), whereas the hours of those at the top were reduced by only 1.6 hours (4 percent). In Table 6, which includes non-workers, these negative effects are (not surprisingly) even larger, with those in the bottom losing 9.6 hours on average (53 percent) compared to those in the top losing an average of 3.8 hours (9 percent).

Table 7 suggests that the observed differences between the overall loss in the bottom quintile and the overall loss in the two highest quintiles are statistically significant. For example, in the worker-only sample, workers in the bottom quintile lost 2.7 and 3.5 more hours on average than workers in the fourth and top quintile, respectively. Workers in the second quintile also lost much more than those in the two highest quintiles and even lost 1.4 more hours on average than workers in the bottom.

Panel B of Table 5 limits the sample to individuals working more hours than usual and shows that workers in the lowest part of the earnings distribution were also working much more than usual (an increase of 3.1 hours on average or 12 percent), while those in other earnings quintiles did not see a statistically significant increase in their hours worked. Table 7 confirms that the increase in hours worked among low-earning workers is statistically

| Table 6 |
| --- |
| **Triple-Difference Estimates of the Effect of the COVID-19 Economic Shutdown on Weekly Hours Worked of Workers and Non-Workers, February and April, 2019–2020** |

| DV: Hours worked (main job) | Weekly earnings quintile |
| --- | --- |
| Overall | Bottom | Second | Middle | Fourth | Top |
| Panel A: Overall (net) | | | | | |
| Actual | 8.066*** | 9.559*** | 12.192*** | 8.636*** | 5.704*** | 3.794*** |
| Actual | (0.174) | (0.319) | (0.419) | (0.461) | (0.457) | (0.495) |
| Percentage change | 24.12% | 52.69% | 35.66% | 24.14% | 15.16% | 9.40% |
| Observations | 327,410 | 75,284 | 67,534 | 65,320 | 60,886 | 57,778 |
| Panel B: Individuals working less than usual | | | | | |
| Actual | 9.968*** | 7.699*** | 10.447*** | 10.665*** | 10.413*** | 9.147*** |
| Actual | (0.357) | (0.495) | (0.851) | (0.973) | (1.029) | (1.247) |
| Percentage change | 54.36% | 69.01% | 54.82% | 51.23% | 48.80% | 40.75% |
| Observations | 93,244 | 28,560 | 20,454 | 17,074 | 14,624 | 11,924 |

Notes: Triple-difference coefficient estimates obtained using ordinary least squares with weekly hours worked as the dependent variable. Each coefficient in the table is generated by applying equation (1) separately to each subgroup. All regressions are estimated with LFS survey weights. Unweighted sample sizes reported. Within-individual cluster-robust standard errors in parentheses. *** denotes statistical significance at the 1% level. Percentage change is computed for each subgroup using the following formula: coefficient/average actual hours worked for workers in February 2020. Sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday, (3) employed individuals who have been absent from work for more than 6 weeks, (4) unpaid family workers, (5) non-workers whose joblessness exceeds 2 months, and (6) individuals who have never worked. Usual hours worked and hourly wages (earnings) are imputed for non-workers using multiple imputation. Source: Canadian Labour Force Survey, 2019–2020.
different from the null finding identified for individuals in all of the other earnings groups.

Finally, Panel C of Table 5 (workers) and Panel B of Table 6 (including non-workers) present the results conditional on individuals working fewer hours than usual. In the worker sample, we find that individuals in the bottom earnings group lose more absolute hours on average than individuals in the top of the distribution. However, Table 6 suggests that, conditioning on hours lost, those in the top lost more absolute hours than those in the bottom. This result is not unexpected: because 99 percent of our high-earner sample works full time, when these individuals move from employment to unemployment or non-participation, they lose far more hours than those in the bottom who are more likely to be employed on a part-time basis. However, note that the percentage change of the loss in hours worked is still much higher for those in the bottom quintile than for those in the top quintile in both the sample of workers and non-workers. Among those working less than usual, Table 7

### TABLE 7

**Quadruple-Difference Estimates of the Effect of the COVID-19 Economic Shutdown on Weekly Hours Worked, Quintile Analysis, February and April, 2019–2020**

| DV: Hours worked (main job) | Overall (net) | Working more | Working less | Overall (net) | Working less |
|-----------------------------|---------------|--------------|--------------|---------------|--------------|
| Actual hours × April × 2020 × Second quintile | –1.416*** | –3.205*** | –2.834*** | –2.633*** | –2.748*** |
| Observations                | (0.460)       | (0.777)      | (0.909)      | (0.544)       | (1.021)      |
| Actual hours × April × 2020 × Middle quintile | .601 | –2.941*** | –1.174 | .697 | –2.966*** |
| Observations                | (0.465)       | (0.784)      | (0.967)      | (0.578)       | (1.113)      |
| Actual hours × April × 2020 × Fourth quintile | 2.717*** | –2.365*** | .708 | 3.856*** | –2.714** |
| Observations                | (0.459)       | (0.752)      | (1.008)      | (0.553)       | (1.130)      |
| Actual hours × April × 2020 × Top quintile | 3.500*** | –3.455*** | 2.744** | 5.765*** | –1.448 |
| Observations                | (0.495)       | (0.796)      | (1.177)      | (0.609)       | (1.374)      |
| Observations                | 121,672       | 28,686       | 29,094       | 133,166       | 40,588       |

Notes: Quadruple-difference coefficient estimates obtained using ordinary least squares with weekly hours worked as the dependent variable. Each coefficient in the table is generated by applying equation (2) separately to each subgroup. All regressions are estimated with LFS survey weights. Unweighted sample sizes reported. Within-individual cluster-robust standard errors in parentheses. *** and **** denotes statistical significance at the 5% and 1% levels, respectively. For the worker panel, the sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday; (3) employed individuals who have been absent from work for more than 6 weeks, and (4) unpaid family workers. For the worker and non-worker panel, the sample also excludes non-workers whose joblessness exceeds 2 months and individuals who have never worked. Usual hours worked and hourly wages are imputed for non-workers using multiple imputation.

Source: Canadian Labour Force Survey, 2019–2020.
documents that, within the worker and non-worker sample, the hour losses of those in the bottom and top quintiles are not statistically different from each other. However, in the worker-only sample, among those working less than usual, those in the bottom quintile lost 2.7 hours more on average than workers in the top quintile.

Why are some workers in the bottom quintile working more than usual, especially in comparison to the higher earners? To explore this finding, we examine the impact of the COVID-19 shutdowns on hours worked for full-time and part-time workers in the bottom quintile using equation (1). We also estimate the differential between full-time and part-time workers using equation (2) (simply replace Second in equation [2] with Fulltime [i.e., full time = 1; part time = 0]). These results are presented in Table 8. Among those working less than usual, full-time workers lost 6.2 hours more on average than part-time workers (again noting that full-time workers have more hours to lose than part-time workers). Our results also suggest, however, that full-time workers did not work more than usual during the pandemic: the middle column of Table 8 indicates that, on average, only part-time individuals worked significantly more than usual. One possible explanation for this finding is that part-time workers may simply wish to work more hours, particularly if their part-time employment was involuntary before the crisis. Another explanation is that

**TABLE 8**

**ESTIMATES OF THE EFFECT OF THE COVID-19 ECONOMIC SHUTDOWN ON WEEKLY HOURS WORKED OF WORKERS BY EMPLOYMENT STATUS, BOTTOM QUINTILE, FEBRUARY AND APRIL, 2019–2020**

| DV: Hours worked (main job) | Overall (net) | Individuals working more than usual | Individuals working less than usual |
|----------------------------|---------------|-------------------------------------|------------------------------------|
| **Full-time workers**      |               |                                     |                                    |
| Actual hours × April × 2020| –9.340***     | –0.358***                           | –12.167***                         |
| (0.801)                    | (1.092)       | (1.390)                             |
| Observations               | 14,248        | 2314                                | 3870                               |
| **Part-time workers**      |               |                                     |                                    |
| Actual hours × April × 2020| –3.922***     | 3.786***                            | –5.937***                          |
| (0.288)                    | (0.647)       | (0.388)                             |
| Observations               | 51,152        | 9556                                | 14,806                             |
| **Full-time/part-time differential** | | | |
| Actual hours × April × 2020 × Full-time | –5.418*** | –4.144*** | –6.231*** |
| (0.851)                    | (1.269)       | (1.442)                             |
| Observations               | 65,400        | 11,870                              | 18,676                             |

*Notes:* Estimates obtained using ordinary least squares with weekly hours worked as the dependent variable. All regressions are estimated with LFS survey weights. Unweighted sample sizes reported. Within-individual cluster-robust standard errors in parentheses. *** denotes statistical significance at the 1% level. Sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday, (3) employed individuals who have been absent from work for more than 6 weeks, and (4) unpaid family workers.

*Source:* Canadian Labour Force Survey, 2019–2020.
employers have more flexibility to adjust the hours of part-time workers than full-time workers. Moreover, employers are not required to pay overtime when adjusting the hours of part-time workers if the total hours remain below the thresholds of 8 hours per day and/or 40 hours per week (note that specific overtime thresholds vary across Canadian jurisdictions).

**Placebo and robustness checks.** To assess the validity of our design and identification strategy, we conduct a placebo test that, in theory, should not produce any discernable effects on hours worked. Using equation (1), we perform this placebo test using time periods just prior to COVID-19—specifically, January 2020 and February 2020, as well as the same months in 2019. The results of the placebo tests are displayed in Appendix C (Table C1). Consistent with our logic, the majority of the coefficients across the placebo tests are not statistically significant. More importantly, however, any significant coefficients are of a very small magnitude, and there is no discernable pattern consistent with the main results we report.

We also undertake a robustness check of our main results comparing 2020 to 2018, rather than 2019, expecting to find a qualitatively similar pattern. These results are displayed in Appendix D (Table D1). We replicate our key conclusions when using 2018 instead of 2019 to account for seasonality; however, compared to our main results in Table 5, the effects become much more negative. This is unsurprising given that the April 2020 LFS reference week (April 12–18) included Easter Monday, a statutory holiday for some employees in Canada, while the 2018 reference week (April 15–21) included no statutory holiday at all. The 2019 reference week (April 14–20) is a potentially better comparison to 2020 because it contained Good Friday, a statutory holiday for most Canadians, and therefore captures normal reductions in hours worked that would have occurred around the Easter holidays in the absence of COVID.

**Conclusion and Policy Implications**

In this article, we use Statistics Canada’s public-use LFS microfiles to explore the impact of the COVID-19 economic shutdown across the earnings distribution in April. Most early analyses found that workers in the bottom of the earnings distribution experienced a much larger net negative shock to hours worked than workers in the top of the earnings distribution. We also document this finding in our study. However, using a novel identification strategy and conditioning on whether workers lost or gained hours, we find that some workers in the bottom of the earnings distribution experienced large
reductions in hours worked, while other low earners experienced a relatively large increase in hours worked compared to workers higher up in the earnings distribution. Our results therefore reveal important heterogeneity in the impacts of the pandemic on hours worked among low- and high-earning workers.

These findings have important policy implications. To mitigate the effect of the public health restrictions and business shutdowns on workers, the Canadian federal government introduced the CERB, which provided a taxable income transfer of $2000 every 4 weeks for up to 28 weeks for workers whose job had been adversely impacted by the COVID-19 closures. The CERB addressed concerns about the limited access that the lowest-earning workers had to Employment Insurance (EI) but who were most in need of income support during the crisis (Harris 2020). After important gaps in the CERB program were subsequently identified, the CERB was expanded to include workers who had not lost their jobs, but whose income had dropped to <$1000 per month. These were welcome developments given our finding that many workers in the bottom of the earnings distribution remained employed, yet were hit particularly hard by a reduction in their working hours.

However, because the CERB was never made available to workers who voluntarily quit their jobs, there was effectively no choice for low-earning workers to decide their preferred level of COVID-19 exposure. In this case, the income-tested U.S. cash transfer of $1200, which provided recipients with an outside income source that was not tied to working at all, may have been, in retrospect, a better policy than the CERB in terms of providing assistance to workers with low earnings during the crisis (noting that the U.S. benefit was a one-time cash transfer of $1200, while the CERB provided much larger benefits of $2000 per month for up to 28 weeks—it is the unconditionality of the U.S. approach we favor here, rather than the total amount received). By providing income support that was unconditional on working, the U.S. transfer provided individuals with greater freedom to choose whether and how much to participate in the labor market early on in the pandemic. In contrast, the Canadian CERB program did not provide this freedom and, given our results, may have placed some low-earning workers in the position of having to risk their health to cover basic needs.

During the crisis, we as a society have come to recognize how reliant we are on low-wage workers to keep our essential services operating. While some provincial governments introduced wage top-ups for low-paid essential workers during the crisis, our results suggest that the risk of COVID-19 exposure at work, and the burden of increased working hours during the crisis, were disproportionately shifted onto low-paid workers who were less likely to be able to work from home and more likely to work in public-facing jobs (e.g., janitors, grocery store clerks, and personal support workers in long-term care
homes). In Canada, these workers would have been ineligible for Canada’s main income support program if they had quit their jobs during the crisis, for instance, out of fear of the virus.

Our analysis has revealed that, compared to individuals higher in the earnings distribution, the lowest earning workers in Canada, by working either more or less than usual, may have experienced inequities in both the labor market and in public policy design throughout the duration of the pandemic. The double liability of the COVID-19 shutdowns on the labor-market outcomes for low-earning workers suggests that, as a group, low-earners were more likely to be simultaneously exposed to a greater likelihood of job and hour losses, as well as to a relatively greater increase in potential exposure to the virus itself.

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FIGURE A1
AVERAGE ACTUAL WEEKLY HOURS AND AVERAGE USUAL WEEKLY HOURS BY QUINTILE, EMPLOYED
RESPONDENTS, JANUARY 2018–OCTOBER 2020

Panel A.1.A: Bottom Quintile

Panel A.1.B: Second Quintile

Panel A.1.C: Middle Quintile

Panel A.1.D: Fourth Quintile

Panel A.1.E: Top Quintile

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Actual Hours Worked  Usual Hours Worked
APPENDIX B

FIGURE B1
AVERAGE USUAL HOURLY WAGES BY QUINTILE, EMPLOYED RESPONDENTS, JANUARY 2018–OCTOBER 2020

Panel B.1.A: Bottom Quintile

Panel B.1.C: Middle Quintile

Panel B.1.D: Fourth Quintile

Panel B.1.E: Top Quintile
## APPENDIX C

### TABLE C1

**TRIPLE-DIFFERENCE ESTIMATES OF THE EFFECT OF THE COVID-19 ECONOMIC SHUTDOWN ON WEEKLY HOURS WORKED OF WORKERS, JANUARY AND FEBRUARY, 2019–2020**

| DV: Hours worked (main job) | Overall | Weekly earnings quintile |
|-----------------------------|---------|-------------------------|
|                             |         | Bottom | Second | Middle | Fourth | Top |
| Actual hours × February × 2020 | 0.893*** | 0.260   | 1.129*** | 1.560*** | 0.846*** | 0.719** |
|                             | (0.125)  | (0.190) | (0.276) | (0.278) | (0.306) | (0.336) |
| Observations                | 378,172 | 78,182 | 78,122 | 79,034 | 74,166 | 68,668 |
| Panel B: Individuals working more than usual | −0.289 | −0.095 | −0.032 | −0.019 | −1.158*** | −0.057 |
| Actual hours × February × 2020 | (0.197)  | (0.472) | (0.434) | (0.430) | (0.405) | (0.408) |
| Observations                | 78,552  | 13,274 | 11,578 | 14,222 | 17,904 | 21,574 |
| Panel C: Individuals working less than usual | −0.456 | −0.701 | −0.176 | −0.737 | −0.597 | −2.191* |
| Actual hours × February × 2020 | (0.371)  | (0.433) | (0.796) | (0.852) | (0.935) | (1.120) |
| Observations                | 82,326  | 21,168 | 17,788 | 16,454 | 14,960 | 11,956 |

Notes: Triple-difference coefficient estimates obtained using ordinary least squares with weekly hours worked as the dependent variable. Each coefficient in the table is generated by applying equation (1) separately to each subgroup. All regressions are estimated with LFS survey weights. Unweighted sample sizes reported. Within-individual cluster-robust standard errors in parentheses. *, **, and *** denotes statistical significance at the 10%, 5%, and 1% levels, respectively. Sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday, (3) employed individuals who have been absent from work for more than 6 weeks, and (4) unpaid family workers.

Source: Canadian Labour Force Survey, 2019–2020.
## APPENDIX D

### TABLE D1
**Triple-Difference Estimates of the Effect of the COVID-19 Economic Shutdown on Weekly Hours Worked of Workers, February and April, 2018 and 2020**

| DV: Hours worked (main job) | Overall | Weekly earnings quintile |
|----------------------------|---------|-------------------------|
|                             |         | Bottom | Second | Middle | Fourth | Top |
| **Panel A: Overall (net)**  |         |        |        |        |        |     |
| Actual                     | −4.627***| −5.015***| −6.753***| −5.723***| −3.754***| −2.906*** |
| Hours × April × 2020       | (0.143) | (0.285) | (0.331) | (0.326) | (0.312) | (0.339) |
| Observations               | 340,262 | 71,698  | 70,224  | 69,960  | 66,288  | 62,092 |
| **Panel B: Individuals working more than usual** |         |        |        |        |        |     |
| Actual                     | 1.193***| 2.889***| 1.098** | 1.060** | 0.686   | 0.663 |
| Hours × April × 2020       | (0.224) | (0.560) | (0.510) | (0.470) | (0.443) | (0.464) |
| Observations               | 73,292  | 13,036  | 10,894  | 13,498  | 16,280  | 19,584 |
| **Panel C: Individuals working less than usual** |         |        |        |        |        |     |
| Actual                     | −10.003***| −8.361***| −12.129***| −13.085***| −8.231***| −6.837*** |
| Hours × April × 2020       | (0.364) | (0.454) | (0.787) | (0.911) | (0.914) | (1.156) |
| Observations               | 66,872  | 18,904  | 14,170  | 12,326  | 11,680  | 9792 |

Notes: Triple-difference coefficient estimates obtained using ordinary least squares with weekly hours worked as the dependent variable. Each coefficient in the table is generated by applying equation (1) separately to each subgroup. All regressions are estimated with LFS survey weights. Unweighted sample sizes reported. Within-individual cluster-robust standard errors in parentheses. ** and *** denotes statistical significance at the 5% and 1% levels, respectively. Sample excludes: (1) self-employed workers, (2) employed individuals who report an absence from work due to vacation or holiday, (3) employed individuals who have been absent from work for more than 6 weeks, and (4) unpaid family workers. Source: Canadian Labour Force Survey, 2018 and 2020.