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THE IMPACT OF MUNICIPAL BROADBAND RESTRICTIONS ON COVID-19 LABOR MARKET OUTCOMES

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ABSTRACT

The COVID-19 pandemic initiated a trend in "work-from-home (WFH)," but workers need reliable and fast internet connections (e.g., broadband) to work from home. Yet, as of January 2020, 18 states had legally restricted local governments and cooperatives from building their own broadband infrastructure and/or providing broadband internet to their communities. Such policies reduced broadband access and competition in states with restrictions compared to states without restrictions leading up to the pandemic (Whitacre and Gallardo 2020). We use CPS data from 2018-2023 to estimate a dynamic difference-in-differences model that shows how labor force participation (LFP) rates changed in states with and without broadband restrictions, before and after the COVID-19 pandemic. We focus on married women with children, a population with more elastic labor supply that may especially value the flexibility that WFH offers (Dettling 2017). We find that married mothers' LFP and employment decreased by 1.7% and 2.2%, respectively, in states with restrictions after the pandemic compared to states without restrictions. Labor force outcomes for women without children and married men with children were unaffected by broadband restrictions. The results suggest that married women with children were less able to remain in the workforce in states where their ability to WFH was limited by broadband restrictions.

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1. Introduction

The internet is an important medium for the exchange of information. Most Americans have access to the internet, but many still lack access to a high-speed broadband connection at home. In 2017, 21.3 million Americans lacked broadband connectivity (FCC 2019). More recent surveys from Pew find that over 25% of Americans do not have home broadband internet (Pew Charitable Trusts 2021). Pew also finds that the lack of access is twice as high for those without any college education and is even higher in rural and tribal areas. Non-broadband users say they do not subscribe because service is too expensive (21%), because they use a smartphone to access the internet (23%), or because service is unavailable or speeds are too slow (7%) (Anderson 2019). Meanwhile, the benefits of broadband diffusion are significant. For example, it increases income (Whitacre, Gallardo, and Strover 2014), improves health outcomes (Van Parys and Brown 2023), and increases employment (Atasoy 2013), partly through improved labor market matching (Bhuller, Kostol, and Vigtel 2020).

Despite the benefits of broadband access, state-level regulations often block public communications initiatives and public-private broadband partnerships. As of 2020, 18 states had regulations that restricted the establishment of community or municipal broadband (BroadbandNow 2021). These regulations either completely ban the establishment or operation of municipal broadband infrastructure, or they create bureaucratic obstacles making it infeasible to create a citywide network (BroadbandNow 2021). The reasoning behind such restrictions is explained in the text of the recently proposed CONNECT Act in the House Commerce Committee of the U.S. Congress (Republicans, Energy and Commerce Committee 2021). The bill would create a nationwide ban on establishing and operating municipal networks. The bill's sponsors say the ban would promote competition by limiting government-run broadband networks throughout the country and encouraging private investment. However, Whitacre and Gallardo (2020) find that municipal/cooperative restrictions have reduced the number of people with broadband access by approximately 4.5%.

Two recent events brought broadband restrictions to the forefront of public discourse. First, beginning in early 2020, the COVID-19 pandemic forced millions of people to stay at home for an extended period of time. The "COVID-19 shut-downs" elevated the importance of having a high-quality broadband connection for employment, education, entertainment, and social connection. Second, the bipartisan infrastructure bill signed into law in November 2021 included the largest-ever federal investment in broadband. The bill included $42.45 billion for the Broadband Equity, Access and Deployment (BEAD) program, which gives money to states to fund broadband deployments in unserved and underserved areas. So while state laws block

some local governments from building their own broadband networks, the federal government is strongly encouraging states to suspend restrictions as they work to spend billions in new grant dollars (NTIA 2022). Thus, there is an increasing tension between state-level policies that restrict broadband provision and the needs of Americans to have high-speed internet.

It is important to show how policies that restrict municipalities from providing broadband affect peoples' labor market outcomes. In this paper, we examine how municipal broadband restrictions affected labor force participation during the COVID-19 pandemic. We link data on state-level broadband restrictions (source: Pew Charitable Trusts) to individual-level Current Population Survey (CPS) data on labor market outcomes measured between Q1:2018 and Q2:2023. We focus on municipal restrictions in place prior to the COVID pandemic. Since all municipal broadband restrictions in our data had been implemented prior to 2018, the empirical strategy exploits the exogeneity of the COVID-19 shock. The COVID-19 shock normalized peoples' use of broadband to work from home. Therefore, we estimate a dynamic difference-in-differences model that compares labor market outcomes for people living in states with municipal restrictions to labor market outcomes for people living in states without restrictions before and after the COVID-19 pandemic began in Q1:2020. We focus on married women with children because (i) their labor force participation is responsive to new technology (Greenwood, Seshadri, and Yorukoglu 2005; Nieto 2023), and (ii) they have a preference for working-from-home, on average (Angrisani, Burke, and Perez-Arce 2023). Following Hansen, Sabia, and Schaller (2022), we also examine the effects of municipal restrictions on two "placebo" groups – women without children and married men with children.

We find that labor force participation and employment declined for married women with children living in states with municipal broadband restrictions during the pandemic compared to their counterparts in states without broadband restrictions. In states with restrictions, labor force participation rates for married mothers began their relative decline in Fall 2021, and those relative declines persisted through the end of 2022. During that time, married women with children were 1.7% less likely ($= \frac{-0.012}{0.71} * 100\%$) to be in the labor force in states with restrictions compared to states without restrictions. Married women with children were 2.2% less likely ($= \frac{-0.015}{0.69} * 100\%$) to be employed. We find no evidence that broadband restrictions affected labor force outcomes for married men with children nor women without children. To explore mechanisms driving our results, we examine changes in labor market participation due to childcare/family obligations. Married mothers in states with restrictions were 4.3% ($= \frac{0.011}{0.256} * 100\%$) more likely to leave the labor force due to care-giving obligations compared to married mothers in states without restrictions. These results square with recent work by the Hamilton Project

at the Brookings Institution, which showed that women with young children have been able to remain in the labor force by working from home (Bauer and Wang 2023).

Our results are broadly consistent with the observed trends in labor supply for women with children during the pandemic. Initially, the labor supply of women with children was disproportionately impacted during the early stages of the pandemic (Albanesi and Kim 2021; Couch, Fairlie, and Xu 2022). However, these effects diminished over time since female employment prior to the pandemic was more concentrated in jobs that can be done remotely (Cowan 2023). During the post-COVID recovery, prime-age female labor force participation reached a record high, driven by a rebound in maternal labor force participation for children under five (Bauer and Wang 2023). As of mid-2023, full days worked at home continue to account for 28 percent of paid workdays among Americans 20-64 years old (Barrero, Bloom, and Davis 2023) with married women still more likely to report that they telework once a week compared with other workers (Bauer and Wang 2023).

2. Literature Review

Research on the COVID-19 pandemic has shown that the pandemic had a disproportionate impact on the labor force participation of married women (Alon et al. 2020; Faberman, Mueller, and Şahin 2022; Schroeter, Lalive, and Karunanethy 2023; Cheng et al. 2020). For example, Garcia and Cowan (2022) find that school closures during the 2020-21 academic year led to a decrease in the probability of women being at work. Importantly, they find workers in jobs with high telework potential did not experience reductions in work hours when schools were closed. Hansen, Sabia, and Schaller (2022) study the effect of K-12 reopenings on the employment outcomes for married women with school-age children. They find K-12 reopenings were associated with a 3.3 percentage point increase in employment and a 0.76 increase in weekly work hours among married women with school-aged children. Hansen, Sabia, and Schaller (2022) estimate reopenings led to a 3.9 percentage point reduction in remote work among married mothers, with larger reductions among college-educated mothers. This suggests that broadband access and remote work during COVID helped balance the competing demands of family and career that mothers face.

Research prior to the COVID-19 pandemic has shown that access to broadband increases the labor force participation of married women. Dettling (2017) finds that broadband use increases labor force participation for married women in the U.S. by 4.1 percentage points but has no impacts on single women or men. She finds that the increase in participation is explained by women using the internet for telework and time-saving tasks related to home

production. Viollaz and Winkler (2020) find that a 1 percentage point increase in internet adoption in Jordan between 2010-2016 increased female labor force participation by about 0.7 percentage points.

We contribute to the existing literature on how broadband affects labor force participation by focusing on the importance of state-level municipal broadband restrictions. We focus on municipal restrictions because these policies create barriers to broadband access despite other state-level policies that aim to increase broadband access (Whitacre and Gallardo 2020). Municipal restrictions have also been shown to affect broadband access more than other state-level policies such as funding or opening a broadband office (Whitacre and Gallardo 2020). This is likely due to the fact that private internet service provider (ISP) incumbents often have little incentive to provide broadband to under-served areas. The high capital investment required to set up broadband is often a barrier. Therefore, workers in states without municipal restrictions have greater access to broadband (Whitacre and Gallardo 2020). We test whether greater access to broadband facilitates more flexible work arrangements, encouraging marginally attached workers – such as women with children – to remain in the labor force.

3. Data

Most of our data comes from two sources. First, we measure whether states had broadband restrictions in place as of January 2018 using the Pew Broadband Policy Explorer website. Second, we measure individual-level labor force outcomes using the monthly Current Population Survey (CPS) from January 2018 to June 2023. We also collect data on COVID-19 cases, COVID-19 deaths, and school closures to use as controls in the analysis.

3.1. State Broadband Regulation

Data on state-level broadband policies come from the Pew Charitable Trusts' state broadband policy explorer. Pew's full database of state-level broadband-related policies includes funding, setting up a dedicated broadband taskforce, right-of-way legislation, municipal restrictions, etc. We focus on whether states had municipal restrictions on broadband in place prior to the COVID-19 pandemic. As of January 2018, 18 states had regulations in place that make establishing community broadband difficult. These regulations include outright bans on the establishment or operation of municipal broadband infrastructure or bureaucratic obstacles making it infeasible to create a citywide network.[1]

[1]Five other states (Iowa, Arkansas, Colorado, Oregon, and Wyoming) had implemented other roadblocks, such as requiring the municipal broadband service to be self-sustaining, price matching with incumbent internet service providers, and/or phantom cost require-

Figure 1 shows the years in which states first implemented restrictions on municipal broadband. Most restrictions went into place between 1999 and 2005, though two states passed restrictions between 2006-2011. We find that states rarely revoke their restrictions on municipal broadband once they are put into place. Indeed, only Washington state reversed its policy on municipal restrictions between Jan 2019 and May 2023.[2]

Figure 2 shows a map of the states with and without municipal restrictions in place as of 2018. The states with broadband restrictions are generally spread out geographically. With the exception of the Northeast region, we find that all regions of the country feature states with and without restrictions on municipal broadband.

3.2. Remote Work

We analyze the effect of municipal restrictions on telework (working from home) during the COVID-19 pandemic using the American Community Survey (ACS) in addition to the CPS. The ACS is a nation-wide survey with an annual sample size of about 3.5 million addresses. The ACS provides 1-year estimates for the means of transportation to work for geographic areas with at least 65,000 people. The ACS variable TRANWORK reports the respondent's primary means of transportation to work over the course of the previous week. Full-time telework can be identified using this variable both before and after the COVID period. We use this variable to show that telework increased considerably after 2020, particularly in states without restrictions on municipal broadband.

The CPS variable COVIDTELEW reports whether the respondent teleworked or worked from home for pay at any time during the previous four weeks due to the COVID-19 pandemic. This broader measure is only available between May 2020 and September 2022. We use this variable to show that telework was more common among people living in states without broadband restrictions compared to people living in states with restrictions.

3.3. Labor Market Outcomes

Data on labor market outcomes and respondent characteristics come from the monthly Current Population Survey (CPS) between January 2018 to June 2023. The CPS provides information on labor force participation, hours worked, and employment. For employment, we consider whether a person is employed (Employed, Any) and whether an employed person is at work the

ments (BroadbandNow 2021).

[2] A bill removing all restrictions on public broadband in Washington was signed into law by Governor Jay Inslee on May 13, 2021. Colorado and California also revoked their restrictions in 2016 and 2018, respectively, so they are classified as not having restrictions in our analysis.

previous week (Employed, At Work).[3] Whether an individual is at work is defined as doing any work for pay or profit or working at least fifteen hours without pay in a family business or farm in the previous week. This excludes individuals who are employed but currently absent from work due to illness, childcare problems or family/personal obligations. To examine the channels that affect labor force attachment, we also include measures of non- or under-employment related to childcare. We use CPS variables to identify respondents who report that they were "taking care of house and family" while not in the labor force (NILF) or working part time last week due to "child care problems". These variables have been used in previous COVID-19-related research to show that women with school-aged children took on a disproportionate share of childcare responsibilities while schools were closed (i.e., the "COVID motherhood penalty") (Garcia and Cowan 2022; Hansen, Sabia, and Schaller 2022).

The CPS records the demographic characteristics of respondents, such as age, gender, education, race, marital status, number of children, age of children, metro status, state-of-residence, and survey-year. We characterize the respondent's racial/ethnic group as either White Non-Hispanic, Black Non-Hispanic, other Non-Hispanic, or Hispanic. We characterize the respondent's educational attainment as either less than a high school degree, high school degree, some college, bachelor's degree, or advanced degree.

Our empirical approach compares labor market outcomes for people living in states with municipal broadband restrictions to people living in states without restrictions before and after the COVID-19 pandemic. Therefore, Table 1 compares summary statistics for these populations in the pre-pandemic period (2018-19). In general, we find that respondents in states with and without broadband restrictions have similar levels of labor force outcomes in the pre-pandemic period. However, we find that respondents in states without restrictions are more likely to have bachelor's or advanced degrees. They are also more likely to be Hispanic or Other Race, and they are more likely to live in a central city. Given these differences, we control for these characteristics in our dynamic difference-in-differences design, which is described in the next section.[4]

[3]During the early stages of the pandemic, some workers who were not at work during the entire reference week were misclassified as employed but absent from work by the BLS. Analyses of the underlying data suggest that this group included some workers affected by the pandemic who should have been classified as unemployed on temporary layoff (U.S. Bureau of Labor Statistics 2022). For this reason, we use both employed and employed, at work as our outcomes.

[4]Much of our analysis focuses on married women with children who might have benefited the most from broadband access to work-from-home during the pandemic. Therefore, Appendix Table A1 shows summary statistics for married women with children from 2018-19 in states with and without broadband restrictions. We focus on 25-54 year old (prime-age) married women with children from the CPS monthly survey. Children are coded as

3.4. Control Variables Related to the COVID-19 Pandemic

The COVID-19 pandemic affected labor supply and labor demand in non-random ways across states (Gupta, Simon, and Wing 2020). Therefore, we use several control variables in our analysis to account for these differences. For example, we use time-varying, state-level controls for school closures, COVID-19 cases per capita, and COVID-19 deaths per-capita. These measures vary by state-quarter.

We employ the strategy used by Garcia and Cowan (2022) for measuring school closures. They use the school closures database from Parolin and Lee (2022). These data are aggregated and anonymized mobile phone records from Safegraph, which track year-over-year changes in the number of visitors to each school or childcare facility relative to the pre-pandemic baseline in 2019. We consider institutions closed if there is at least a 50 percent year-over-year decline in the number of in-person visits. We calculate the share of closed institutions in each state in each quarter between 2020 and 2022 as the measure of the extent of school closures in the analysis; thus, the variable is a continuous measure between zero and one. The variable equals zero for all states and quarters before January 2020 and after May 2022.

State-level measures of the cumulative COVID-19 case rate and the cumulative COVID-19 death rate come from the CDC (CDC 2022), and are measured in each state and quarter between 2020 and 2023. Prior to Q1:2020, these measures equal 0 in all states and quarters. We use these measures to control for changes in the severity of the pandemic, and to proxy for differences in labor demand and supply, within states over time. For instance, research shows that COVID-19 cases per capita affected the number of unemployment claims across states in the early pandemic period (Rojas et al. 2020). In addition, Goda and Soltas (2023) show that workers with severe COVID-19 infections reduce their labor supply one year later.

One set of control variables that we do not use, but have been used in other papers, is differences in unemployment insurance (UI) generosity across states. (Coombs et al. 2022) show that the early withdrawal of enhanced benefits in 22 states in June 2021 increased weekly employment among UI beneficiaries. However, enhanced benefits ended in all states in September 2021. Since we employ the use of a quarterly panel and find that our effects persist well into 2022, we are able to discount this channel.

present if a respondent has at least one child in the household between the ages of 0 and 17. For placebo comparison, we examine the effects on married men with children and women without children. In states without municipal restrictions, married women with children have slightly lower labor force attachment prior to the pandemic. They are also more likely to hold an advanced degree, are slightly older, are less likely to be Black, are more likely to be Hispanic, and are more likely to live in a central city.

4. Methods

We estimate the effects of municipal broadband restrictions on labor force outcomes using a repeated (quarterly) cross-section of data constructed from the CPS from Q1:2018 to Q2:2023. We compare labor force outcomes for people living in states with municipal restrictions on broadband to labor force outcomes for people living in states without restrictions before and after the COVID-19 pandemic began in Q1:2020. We focus our analysis on a group of people whose labor force participation may have been particularly sensitive to broadband availability during the COVID-19 pandemic: married women with children. However, we also show results for other sub-groups such as (i) women without children and (ii) married men with children.

Our empirical method uses a dynamic difference-in-differences estimator defined as follows:

$$y_{irst} = \sum_{k=-8, k\neq -1}^{14} \beta_k (Muni_s \times I_k) + \Omega X_{it} + \delta_s + \lambda_{t\times r} + S_{st} + \epsilon_{irst} \quad (1)$$

We estimate Equation (1) as a linear probability model where y_{ist} is an indicator variable for outcomes such as labor force participation and employment for individuals $i = 1, \ldots, N$ in state s in region r at time t, where t indicates a quarter between Q1:2018 and Q2:2023 (22 quarters total). $Muni_s$ is a state-level binary variable that equals one for people living in states that had restrictions on municipal broadband as of Q1:2018. We interact the binary $Muni_s$ variable with binary variables indicating quarters from Q1:2020 (when the COVID-19 pandemic begins). We omit the interaction between $Muni_s$ and Q1:2020 as the base period. X_{it} is a vector of individual characteristics, which allow for differences in labor force outcomes across demographic groups. These controls include respondent education, age, race, marital status, number of children, and metro area residency (e.g. in central city). δ_s are state fixed effects. S_{st} includes state-level controls varying at the quarterly level including school closures, cumulative COVID-19 case rates, and cumulative COVID-19 death rates. We also include time-by-region fixed effects $\lambda_{t\times r}$ to control for time-varying demand for labor by region over time.[5] Finally, we cluster the standard errors at the state-level. We estimate Equation (1) separately for married women with children, women without children, and married men with children. The coefficients of interest, β_k, show the effects of broad-

[5]The CPS identifies the Census region where the respondent's housing unit is located. Collections of states are categorized into regions. For example, the East North Central Division includes Illinois, Indiana, Michigan, Ohio and Wisconsin. There are 9 Census regions in the U.S.

band restrictions on labor force participation for these groups before and after the COVID-19 pandemic start date.

One identifying assumption is that the labor force outcomes for these groups in states with broadband restrictions would have evolved comparably over time to labor force outcomes in states without broadband restrictions, but for the COVID-19 pandemic. We cannot test this assumption directly, but we can estimate differences in trends in labor force outcomes across these states prior to COVID-19. To evaluate differences in trends in the pre-COVID-19 period, we plot our dynamic difference-in-differences estimates. Our estimates for $[\beta_{-8}, \ldots, \beta_{-1}]$ show a lack differential pre-trends in labor force outcomes for women with children. To verify the lack of differential pre-trends, we test whether these parameters are jointly statistically significant.

One advantage of the COVID-19-era analysis is that all of the states with municipal restrictions on broadband implemented those restrictions prior to the COVID-19 pandemic. Only Washington state reversed its policy on municipal restrictions in June 2021.[6] Moreover, it was rare to work from home prior to the pandemic. So it is plausible that municipal restrictions on broadband did not affect labor force outcomes in the two years prior to the pandemic. The fact that we fail to find differential pre-trends in labor force outcomes of married mothers across states with and without municipal restrictions prior to the COVID-19 pandemic seems to support this hypothesis.

Another identifying assumption is that states with municipal restrictions did not adopt policies during the COVID-19 pandemic that affected labor force outcomes differently in their states compared to states without broadband restrictions (or vice versa). For example, it is well known that state and local governments took different approaches to in-person K-12 schooling during the pandemic. If states with municipal restrictions on broadband also closed in-person schooling for longer periods of time, then our results for married women with children could be driven by differences in school closures rather than differences in access to broadband. For this reason, we follow the literature in controlling for school closures. In addition, we control for COVID-19 cases per capita and COVID-19 death rates per capita at the state-quarter-level in an effort to proxy for the severity of the pandemic in different states at different points in time. The rationale behind these control variables is that COVID-19 case/death rates could have affected labor supply/demand differently across states and/or they could have been correlated with state policies to address the pandemic.

With these assumptions and limitations in mind, we summarize the re-

[6] Given that broadband infrastructure takes time to build, we code Washington as a treated state (i.e., one with restrictions) in our main analysis. In robustness tests, we drop CPS respondents from Washington from the sample, and find very similar results.

sults from Equation (1) with a standard difference-in-differences estimator. The standard difference-in-differences model takes the following form:

$$y_{isrt} = \beta_1(Muni_s \times Post_t) + \Omega X_{it} + \delta_s + \lambda_{t\times r} + S_{st} + \epsilon_{isrt} \tag{2}$$

Equation (2) contains the same control variables as in Equation (1). The only difference is that we only include one interaction, which multiplies the binary variable for states with municipal restrictions ($Muni_s$) with an indicator for the post-pandemic period ($Post_t = 1$ from Q1:2020-Q2:2023; $Post_t = 0$ from Q1:2018-Q4:2019). We estimate equation (1) for three subgroups: (i) married women with children, (ii) women without children, and (iii) married men with children. We present the results from equation (1) in table format for each subgroup.

5. Results

This paper shows how municipal restrictions on broadband internet affected labor force outcomes during the COVID-19 pandemic when "work-from-home" (i.e., telework) became commonplace. Our results are divided into three sections. We first describe evidence from both the CPS and the ACS on rates of telework across states with and without broadband restrictions. Second, we estimate the effects of broadband restrictions on the labor force participation and employment of married women with children, a group with somewhat elastic labor supply that might have especially benefited from the ability to work from home. We compare these results with labor force outcomes for women without children and married men with children. Third, we explore heterogeneity in the effects of broadband restrictions on maternal labor supply by education, race, and the age of the youngest child in the home.

5.1. Broadband Restrictions and Remote Work

First we show how municipal restrictions on broadband internet affected the probability that survey respondents teleworked (worked from home) during the COVID-19 pandemic. We use ACS 1-year data to show trends in telework over time from 2018–2021. The ACS variable TRANWORK reports the respondent's primary means of transportation to work over the course of the previous week. Full-time telework can be identified using this variable both before and after the COVID period. We do not use this outcome for regression analyses since there are only two data points (i.e., 2020 and 2021) available for the COVID period. Further, ACS estimates from 2020 must be treated with caution since survey collection was disrupted by the pandemic. Despite this, a clear pattern is visible. States with restrictions tend to have persistently

lower rates of telework in both 2020 and 2021. This can be seen in the graph in Figure 3. A similar pattern is seen for the various subgroups of interest. In restriction states, telework rates are 1.4 percentage points lower for married women with children, 2.4 percentage points lower for women without children, 1.1 percentage points lower for married men with children. Among the various subgroups, women with children have the highest rate of telework (over 20%). Further, women with children were more likely (than other groups) to work remotely before the pandemic (2017-19) suggesting they prefer more flexible work arrangements.

Next, we examine telework propensities in the CPS data. The CPS variable COVIDTELEW reports whether the respondent teleworked or worked from home for pay at any time during the previous four weeks due to the COVID-19 pandemic. Figure 4 plots this broader measure as a quarterly time series for prime-age workers (it is only available between May 2020 and September 2022). During this period, workers in restriction states consistently work from home at lower rates (between 2.9 to 6.4 percent with the largest difference in Q1 2021). Therefore, our results on telework suggest that states' restrictions on municipal broadband internet make telework less feasible.

5.2. Maternal Labor Force Outcomes

The results for married mothers' labor force outcomes appear in Figure 5 and Table 2. Figure 5 plots the dynamic difference-in-differences estimates for three maternal labor force outcomes: the probability of being in the labor force (LFP), the probability of being employed at all, and the probability of being employed, at work. We find that married women with children in states with municipal restrictions were 1.7% ($= \frac{-0.012}{0.71} * 100\%$) less likely to be in the labor force and 2.2% ($= \frac{-0.015}{0.69} * 100\%$) less likely to be employed during the COVID-19 pandemic compared to their counterparts in states without broadband restrictions. The results are driven by a relative decline in labor force participation for married mothers in states with municipal restrictions starting in Q3-2021 and extending through Q4-2022.[7] This divergence in maternal labor force participation across states with and without broadband restrictions coincides with the expiration of extended federal unemployment benefits (Coombs et al. 2022). In other words, married mothers' ability to work from home may have become especially consequential for their labor force participation as unemployment insurance benefits expired.[8]

[7]This divergence in maternal labor force participation rates across restriction and non-restriction states can also be seen in the raw trends for the same labor force outcomes in Figure A1. Labor force participation and employment decline in states with restrictions (dotted line) starting in Q3-2021 while they increase in states without restrictions (solid line).

[8]Related to the timing of the effect, we rule out alternative explanations such as changes in sample sizes or school re-openings (which we control for).

To test the parallel trends assumption underlying our difference-in-differences strategy, we test the joint statistical significance of the pre-period difference-in-differences coefficients. The p-values on the joint tests are 0.19, 0.27, and 0.12, respectively. Therefore, the results support the parallel trends assumption for labor force participation and employment status as outcomes.

Table 2 summarizes the effects of broadband restrictions on labor force outcomes for married women with children (Panel A), women without children (Panel B), and married men with children (Panel C). We find that broadband restrictions only reduce labor force participation among married women with children. The probability that married mothers are in the labor force is 0.012 lower in states with municipal restrictions on broadband compared to states without restrictions during the pandemic (column 1). Additionally, the probability that married mothers are employed-at-work is 0.015 lower in states with municipal restrictions compared to states without restrictions during the pandemic (column 2). There is also a reduction in the probability that married mothers are employed (at all) in states with restrictions during the pandemic, but there is no effect on number of hours worked. Hence our results suggest that municipal restrictions on broadband primarily affected the extensive margin of labor force participation for married mothers, rather than the intensive margin. Panels B and C generally show no relationship between municipal restrictions on broadband and labor force outcomes for women without children and married men with children.[9,10]

Table 3 shows that most of the decrease in labor force attachment in states with broadband restrictions during COVID-19 comes from married mothers shifting from employment to childcare (Panel A). Married mothers in states with restrictions on municipal broadband are 4.3% ($= \frac{0.012}{0.277} * 100\%$) more likely to work part-time or not-at-all due to "family reasons" (column 1). They are 4.3% ($= \frac{0.011}{0.256} * 100\%$) more likely to "not be in the labor force (NILF)" because they are "taking care of house or family" (column 2). However, we find no difference in probability of having "child care problems" for married mothers in states with broadband restrictions compared to states without restrictions during COVID-19 (column 3). Women without children may have experienced a small (0.4 percentage point) decrease in the probability of being part-time or not working due to family reasons (opposite sign of our finding for

[9] Appendix tables A2 through A5 present complete regression estimates for all three groups of interest. Appendix table A2 reports the estimates for labor force participation, table A3 reports the estimates for "employed at work," table A4 reports the estimates for employment overall, and table A5 reports the estimates for hours worked last week.

[10] We also perform a robustness check on the results. We drop Washington State from the analysis because it was the only state to change its municipal restrictions on broadband during the COVID-19 period. Appendix table A6 shows the results with this specification. These results are even stronger (i.e., more precise) than the results from the full sample in Table 2.

married women with children). Besides this, as in Table 2, we find no significant effects of municipal restrictions on broadband during COVID for these outcome variables for women without children or married men with children (Panels B and C, respectively).

5.3. Heterogeneity by Maternal Characteristics

Next, we present results showing how municipal restrictions on broadband affect the labor force outcomes of married mothers with different characteristics, namely by education levels, by race, and by age of youngest child. Table 4 shows results by education level for married women with children. Previous research has shown that college graduates were more likely to work remotely during the pandemic (Goldin 2022). We find that restrictions on municipal broadband decrease labor force participation more among college-educated married mothers compared to non-college-educated married mothers, and that the results are more precisely estimated for college-educated married mothers. This result is consistent with Atasoy (2013) who found, prior to the pandemic, that broadband access increased employment the most in counties with high shares of college graduates. However, the differences in our estimates between college-educated and non-college educated mothers are not statistically significantly different from one another. This may be because a large share of women without a college degree also worked in teleworkable jobs as of 2022 (Cowan 2023), and/or because we are under-powered to detect the differences.

Table 5 shows results by race (white vs. non-white) for married women with children. Here we find that restrictions on municipal broadband affect women of different races similarly; both white and non-white married mothers reduce their labor force participation in states with restrictions compared to states without restrictions during the COVID-19 pandemic. In other words, our estimated effects by race are not statistically significantly different.

Next we divide the sample of married mothers into groups based on the age of the youngest child. Using the CPS COVIDTELEW variable (described in section 5.1, we find that mothers with young children are 3.3 percent more likely to work remotely between 2020-2022 (this gap is over 4 percent in 2020), suggesting they have more flexible work arrangements (result not shown). Hence, we expect mothers with younger children to be most affected. In Table 6, we split the sample by child age, separating married mothers whose youngest child is between the ages of 0 and 11 versus those whose youngest child is between 12 and 17. The relative decline in labor force participation in states with broadband restrictions comes almost entirely from mothers with younger children.

6. Conclusion

This paper shows how restrictions on municipal broadband internet affected the labor force outcomes of married women with children before and after the COVID-19 pandemic. We cite previous research showing that people living in states with municipal restrictions on broadband have less access to high-speed internet than people living in states without such restrictions. We show that trends in telework sharply diverge during the pandemic, where states with restrictions see lower rates of working from home. Our hypothesis in this paper was that reduced access to high-speed internet reduced peoples' ability to work from home after Q1-2020. Our analysis focuses on one group of people whose labor supply may have been especially sensitive to remote work options during the pandemic – married women with children. For comparison, we also consider the effects of broadband restrictions on two other groups – women without children and married men with children. Our difference-in-differences estimates reveal that municipal broadband restrictions reduced labor force participation and employment among married women with children. Though LFP was increasing overall for these groups in the post-pandemic period, LFP increased faster among these groups in states without restrictions on broadband internet. In contrast, we find that broadband restrictions did not affect labor force outcomes for women without children or married men with children.

Our results are driven by relative decreases in labor force participation among women with children in states with broadband restrictions beginning in Q3-2021. This time period coincides with the expiration of federal extended unemployment benefits. As such, labor force participation among married mothers began increasing overall in 2021, but LFP increased more in states without restrictions on municipal broadband. We posit this divergence across states occurred because married mothers had the ability to work remotely in states without broadband restrictions.

To explore the channels that affected maternal labor force attachment, we examine non-employment or under-employment related to childcare. The results show that married mothers alone shifted from employment to caregiving in states with municipal restrictions on broadband. Additionally, social norms and the gender wage gap might have compelled mothers to yield home office space to their spouses or children in states where access to high-speed internet was more limited (Moldovan 2020).

Overall, this paper highlights the importance of broadband access in the modern economy. Access to high speed internet makes work easier, especially for women with children. Therefore, our paper shows that there are economic consequences to states' municipal restrictions on broadband; namely, broadband restrictions can reduce labor force participation among marginally

attached groups of workers.

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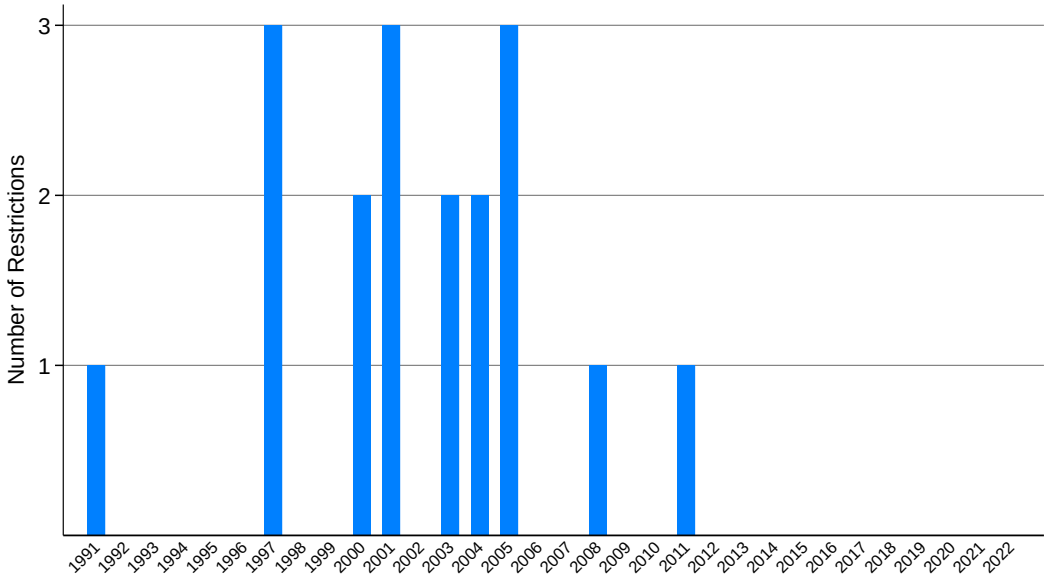
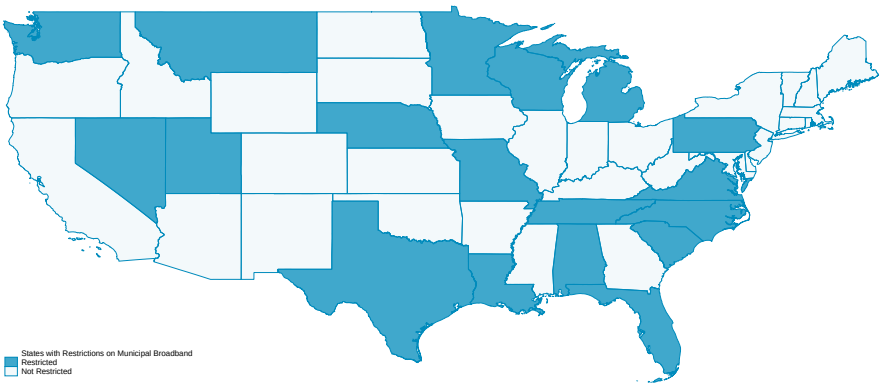
Figure 1: Number of Municipal Restrictions Passed in State Legislatures



Source: Pew State Broadband Policy Explorer, 1999–2022

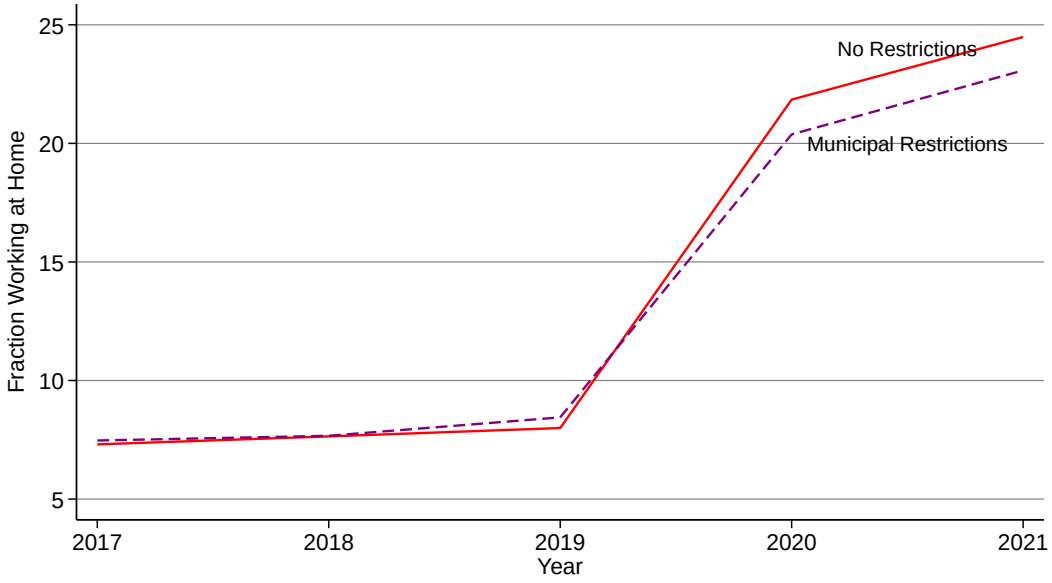
Figure 2: States with Restrictions on Municipal Broadband (2018)



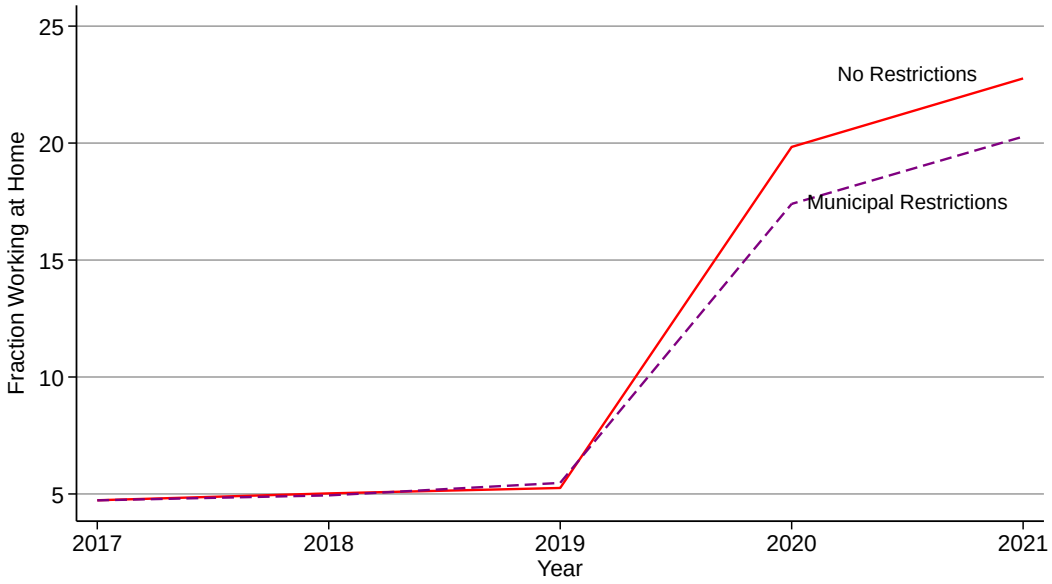
Source: Pew State Broadband Policy Explorer

Figure 3: Trends in Telework by State Municipal Broadband Restrictions

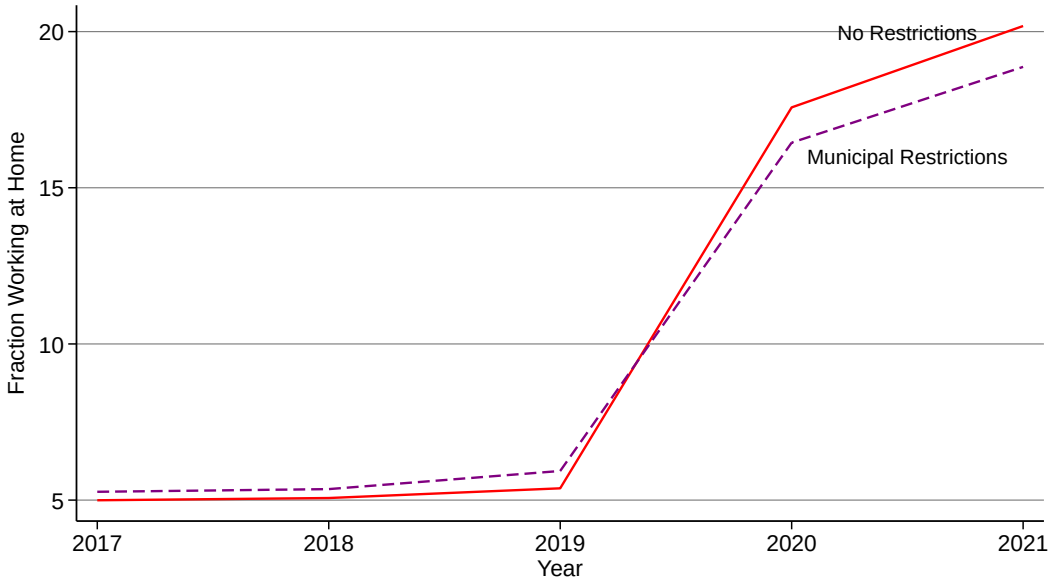
(a) Married Women with Children



(b) Women without Children



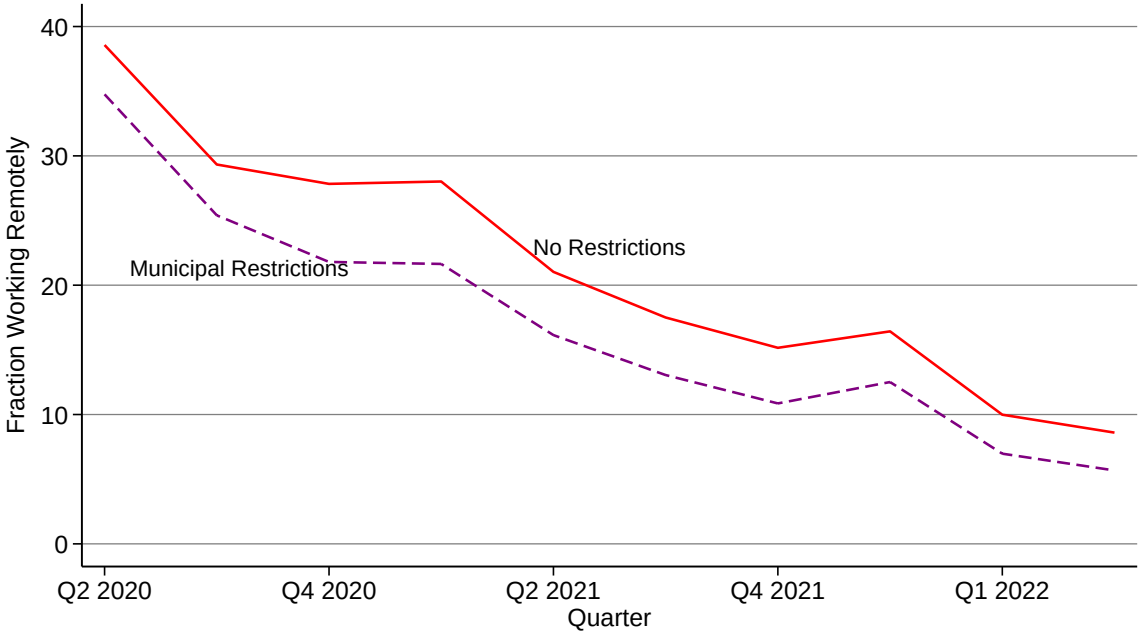
(c) Married Men with Children



Notes: Prime Age Workforce (25 to 54 Years Old)

Source: American Community Survey 1-year estimates, 2017–2021.

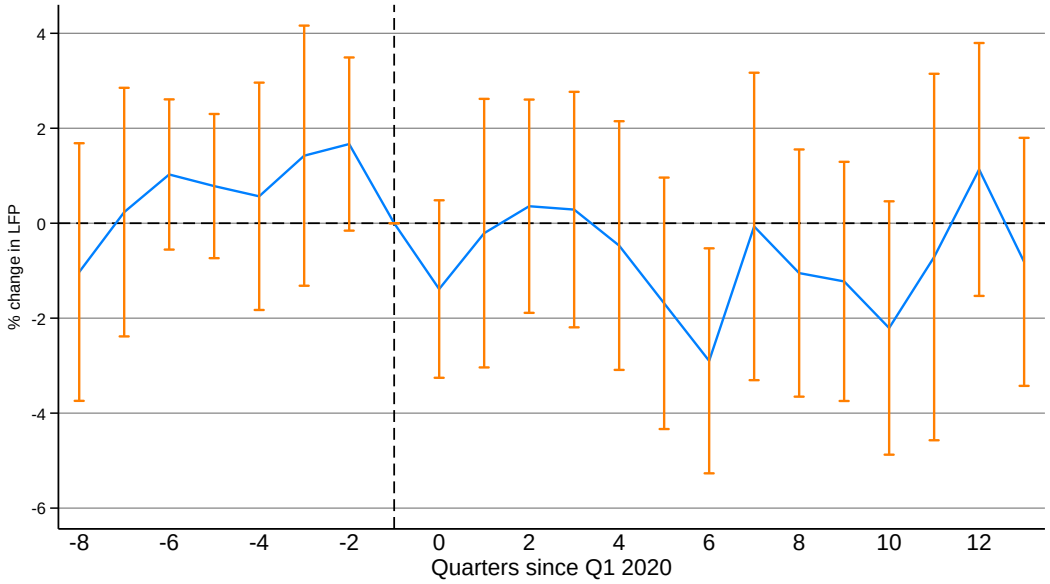
Figure 4: Quarterly Trends in Work From Home by State Municipal Broadband Restrictions



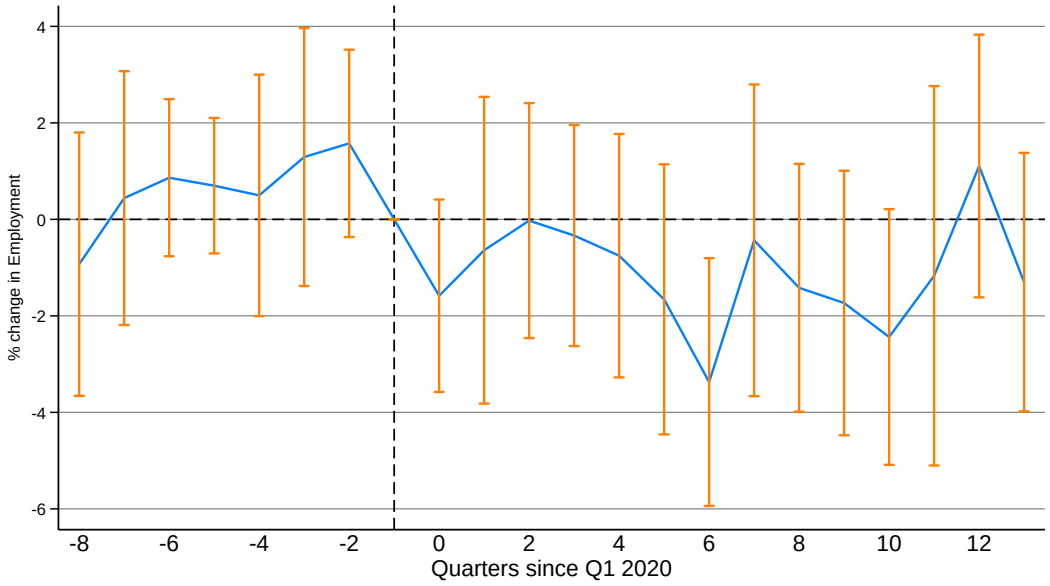
Source: Prime-Age Workers, Monthly Current Population Survey, 2020-2022

Figure 5: Dynamic Effects of Municipal Broadband Restrictions on Labor Force Outcomes of Married Women with Children: Event Study Estimates

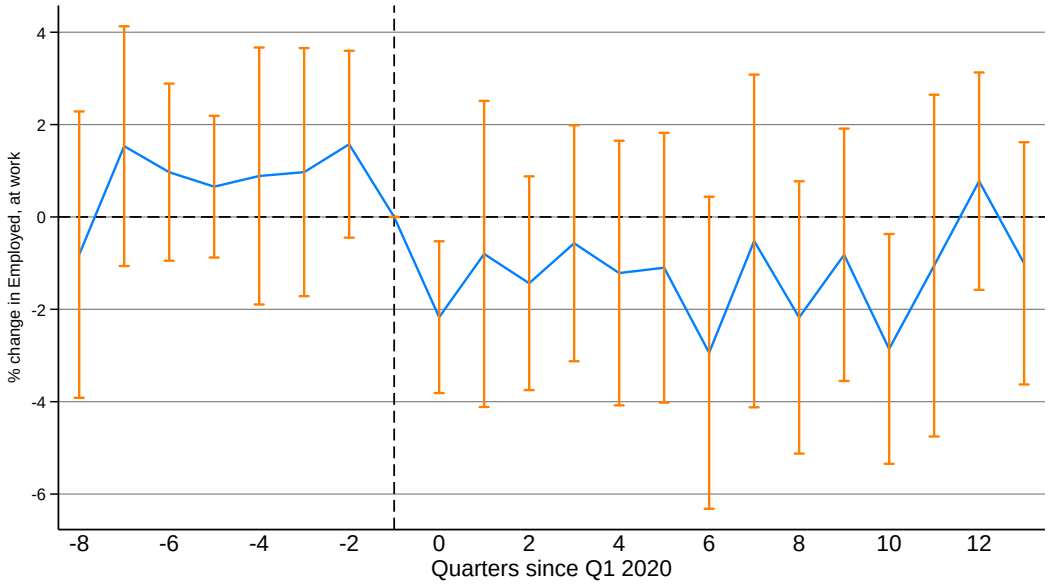
(a) Labor Force Participation



(b) Employment



(c) Employed, At Work



Notes: Q1 2018 to Q2 2023: 25 to 54 Years Old, Married Women with Children
Source: Monthly Current Population Survey, 2018–2023.

Table 1: Summary Statistics 2018–2019, All Prime-Age Workers

	States without Restrictions	States with Restrictions
Labor Force Particpation	0.825	0.825
	(0.380)	(0.380)
Employed, Any	0.797	0.800
	(0.402)	(0.400)
Employed, At Work	0.772	0.775
	(0.419)	(0.418)
Hours Worked Last Week	40.403	40.735
	(11.603)	(11.757)
Not in Labor Force, Family Reasons	0.083	0.084
	(0.276)	(0.278)
Part-Time/Not Working, Family Reasons	0.091	0.092
	(0.288)	(0.288)
Part-Time, Childcare Reasons	0.008	0.007
	(0.089)	(0.083)
Less than High-School	0.075	0.076
	(0.264)	(0.265)
High-School	0.597	0.629
	(0.491)	(0.483)
Some College	0.253	0.273
	(0.435)	(0.446)
College degree	0.256	0.245
	(0.436)	(0.430)
Advanced Degree	0.147	0.127
	(0.354)	(0.333)
Age	39.110	39.196
	(8.754)	(8.728)
Black	0.113	0.146
	(0.317)	(0.353)
White	0.563	0.595
	(0.496)	(0.491)
Hispanic	0.206	0.186
	(0.405)	(0.389)
Other Race	0.117	0.074
	(0.322)	(0.261)
Number of Own Children	1.079	1.106
	(1.247)	(1.264)
In Central City	0.328	0.278
	(0.470)	(0.448)
N	668,499	426,954

Notes: Means with standard deviation in parentheses. Sample includes adult (25-54) persons. Observations are weighted using CPS individual sample weights. Hours are estimated conditional on employment.
Source: CPS Monthly Estimates 2018–2019

Table 2: Effects of Municipal Restrictions on Labor Force Outcomes by Sub-Group

	(1) Labor Force Participation	(2) Employed, At Work	(3) Employed, Any	(4) Hours Last Week
Panel A: Married Women with Children				
Restrictions ×Post	-0.0123*	-0.0155**	-0.0134*	0.1290
	(0.0071)	(0.0074)	(0.0069)	(0.1437)
R^2	0.094	0.085	0.099	0.028
N	496,613	496,613	496,613	329,100
Panel B: Women without Children				
Restrictions ×Post	0.0002	0.00000	-0.0005	-0.0332
	(0.0036)	(0.00355)	(0.0032)	(0.1461)
R^2	0.074	0.068	0.076	0.021
N	684,948	684,948	684,948	500,632
Panel C: Married Men with Children				
Restrictions ×Post	0.0020	0.0022	0.0003	-0.1426
	(0.0030)	(0.0039)	(0.0037)	(0.0878)
R^2	0.017	0.022	0.026	0.021
N	464,419	464,419	464,419	418,916

Notes: The treatment variable is a dummy for persons (aged 25 to 54) living in states with municipal restrictions as of Q1:2018. All regressions include state fixed effects and region by quarter fixed effects. Individual control variables include age, race (Black Non-Hispanic, other Non-Hispanic, and Hispanic), education (less than high school, some college, bachelor's degree, advanced degree), metro area residency, marital status, number of children in the household and an indicator for at least one child under 13. State COVID-19 controls include a continuous measure of cumulative cases and deaths per capita (per 1M residents) along with a control for school closures. Observations are weighted using CPS sample weights. Robust standard errors are clustered at the state-level. Significance at 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Table 3: Effects of Municipal Restrictions on Labor Force Status (Family Reasons)

	(1) Part-Time or Not Working, Family Reasons	(2) NILF, Taking Care of House or Family	(3) Part-Time, Child-Care Problems
Panel A: Married Women with Children			
Restrictions ×Post	0.0120*	0.0115*	0.0007
	(0.0064)	(0.0062)	(0.0018)
R^2	0.096	0.096	0.007
N	496,613	496,613	496,613
Panel B: Women without Children			
Restrictions ×Post	-0.0042*	-0.0035	-0.0006*
	(0.0025)	(0.0023)	(0.0003)
R^2	0.054	0.054	0.002
N	684,948	684,948	684,948
Panel C: Married Men with Children			
Restrictions ×Post	-0.0001	-0.0004	0.0003
	(0.0020)	(0.0017)	(0.0005)
R^2	0.005	0.005	0.002
N	464,419	464,419	464,419

Notes: Part-Time or Not Working, Family Reasons is an indicator for any the following: (i) Main reason not looking for work during last four weeks - "can't arrange childcare," (ii) Major activity (NILF) - "taking care of house or family," (iii) Reason for working part time last week - "childcare problems," or (iv) Reason for absence from work - "childcare problems." The treatment variable is a dummy for persons (aged 25 to 54) living in states with municipal restrictions as of Q1:2018. All models include state fixed effects and region by quarter fixed effects. Individual control variables include age, race (Black Non-Hispanic, other Non-Hispanic, and Hispanic), education (less than high school, some college, bachelor's degree, advanced degree), metro area residency, marital status, number of children in the household and an indicator for at least one child under 13. State COVID-19 controls include a continuous measure of cumulative cases and deaths per capita (per 1M residents) along with a control for school closures. Observations are weighted using CPS sample weights. Robust standard errors are clustered at the state-level. Significance at 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Table 4: Effects of Municipal Restriction on Labor Force Outcomes by Education

	(1) Labor Force Participation	(2) Employed, At Work	(3) Employed, Any	(4) Hours Last Week
Panel A: College-Educated Married Women with Children				
Restrictions $\times Post$	-0.0144**	-0.0191***	-0.0154**	0.1095
	(0.0070)	(0.0070)	(0.0066)	(0.2743)
R^2	0.046	0.044	0.046	0.022
N	252,290	252,290	252,290	185,077
Panel B: Non College-Educated Married Women with Children				
Restrictions $\times Post$	-0.0094	-0.0108	-0.0106	0.2154
	(0.0106)	(0.0111)	(0.0105)	(0.1897)
R^2	0.058	0.059	0.061	0.025
N	244,323	244,323	244,323	144,023

Notes: The treatment variable is a dummy for persons (aged 25 to 54) living in states with municipal restrictions as of Q1:2018. All models include state fixed effects and region by time fixed effects. Individual control variables include age, race (Black Non-Hispanic, other Non-Hispanic, and Hispanic), education (less than high school, some college, bachelor's degree, advanced degree), metro area residency, marital status, number of children in the household and an indicator for at least one child under 13. State COVID-19 controls include a continuous measure of cumulative cases and deaths per capita (per 1M residents) along with a control for school closures. Observations are weighted using CPS sample weights. Robust standard errors are clustered at the state-level. Significance at 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Table 5: Effects of Municipal Restrictions on Labor Force Outcomes by Race

	(1) Labor Force Participation	(2) Employed, At Work	(3) Employed, Any	(4) Hours Last Week
Panel A: White Married Women with Children				
Restrictions $\times Post$	-0.0105	-0.0148**	-0.0117*	0.0896
	(0.0066)	(0.0065)	(0.0064)	(0.1580)
R^2	0.086	0.076	0.088	0.031
N	329,871	329,871	329,871	229,465
Panel B: Non-White Married Women with Children				
Restrictions $\times Post$	-0.0167	-0.0202*	-0.0196*	0.0595
	(0.0110)	(0.0111)	(0.0105)	(0.2400)
R^2	0.077	0.074	0.082	0.028
N	166,742	166,742	166,742	99,635

Notes: The treatment variable is a dummy for persons (aged 25 to 54) living in states with municipal restrictions as of Q1:2018. All models include state fixed effects and region by time fixed effects. Individual control variables include age, education (less than high school, some college, bachelor's degree, advanced degree), metro area residency, marital status, number of children in the household and an indicator for at least one child under 13. State COVID-19 controls include a continuous measure of cumulative cases and deaths per capita (per 1M residents) along with a control for school closures. Observations are weighted using CPS sample weights. Robust standard errors are clustered at the state-level. Significance at 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Table 6: Effects of Municipal Restrictions on Labor Force Outcomes by Age of the Youngest Child

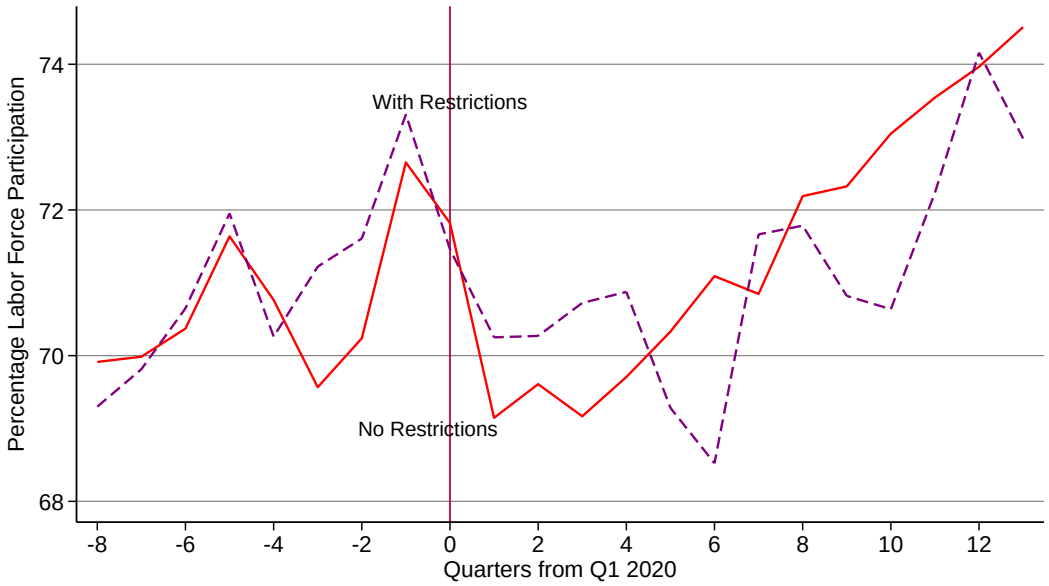
	(1) Labor Force Participation	(2) Employed, At Work	(3) Employed, Any	(4) Hours Last Week
Panel A: Youngest Child Age 0-11				
Restrictions $\times Post$	-0.0151***	-0.0231***	-0.0185***	-0.0790
	(0.0046)	(0.0049)	(0.0047)	(0.1565)
R^2	0.099	0.085	0.103	0.032
N	244,190	244,190	244,190	156,769
Panel B: Youngest Child Age 12-17				
Restrictions $\times Post$	-0.0019	-0.0054	-0.0038	0.0624
	(0.0102)	(0.0132)	(0.0121)	(0.3273)
R^2	0.070	0.065	0.074	0.023
N	128,359	128,359	128,359	94,067

Notes: The treatment variable is a dummy for persons (aged 25 to 54) living in states with municipal restrictions as of Q1:2018. All models include state fixed effects and region by time fixed effects. Individual control variables include age, race (Black Non-Hispanic, other Non-Hispanic, and Hispanic), education (less than high school, some college, bachelor's degree, advanced degree), metro area residency, marital status, and number of children in the household. State COVID-19 controls include a continuous measure of cumulative cases and deaths per capita (per 1M residents) along with a control for school closures. Observations are weighted using CPS sample weights. Robust standard errors are clustered at the state-level. Significance at 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.

Appendices

Figure A1: Trends in Labor Force Outcomes for Married Women with Children by State Municipal Broadband Restrictions, Unadjusted Data

(a) Labor Force Participation



(b) Employment

(c) Employed, At Work

Notes: Q1:2018 to Q2:2023: 25 to 54 Years Old, Married Women with Children
Source: Monthly Current Population Survey, 2018–2023.

Table A1: Summary Statistics 2018–2019, Married Women with Children

	States without Restrictions	States with Restrictions
Labor Force Particpation	0.707	0.711
	(0.455)	(0.453)
Employed, Any	0.690	0.695
	(0.463)	(0.461)
Employed, At Work	0.653	0.659
	(0.476)	(0.474)
Hours Worked Last Week	36.568	36.603
	(11.763)	(11.979)
Part-Time/Not Working, Family Reasons	0.283	0.277
	(0.451)	(0.448)
Not in Labor Force, Family Reasons	0.257	0.255
	(0.437)	(0.436)
Part-Time, Childcare Reasons	0.026	0.022
	(0.159)	(0.145)
Less than High-School	0.071	0.069
	(0.257)	(0.254)
High-School	0.507	0.519
	(0.500)	(0.500)
Some College	0.236	0.258
	(0.425)	(0.438)
College degree	0.293	0.302
	(0.455)	(0.459)
Advanced Degree	0.200	0.179
	(0.400)	(0.383)
Age	39.282	38.748
	(7.167)	(7.147)
Black	0.066	0.082
	(0.248)	(0.274)
White	0.581	0.626
	(0.493)	(0.484)
Hispanic	0.213	0.198
	(0.409)	(0.399)
Other Race	0.140	0.094
	(0.347)	(0.292)
Number of Own Children	2.151	2.180
	(1.020)	(1.053)
In Central City	0.272	0.229
	(0.445)	(0.420)
N	125,352	82,074

Notes: Means with standard deviation in parentheses. Sample includes adult (25-54) married women with children. Observations are weighted using CPS individual sample weights. Hours are estimated conditional on employment.
Source: CPS Monthly Estimates 2018–2019

Table A2: Effects of Municipal Restrictions on Labor Force Participation

	(1) Married Women with Children	(2) Women without Children	(3) Married Men with Children
Restrictions ×Post	-0.0123*	0.0002	0.0020
	(0.0071)	(0.0036)	(0.0030)
Age	0.0429***	0.0030***	0.0062***
	(0.0028)	(0.0011)	(0.0014)
Age-Squared	-0.0005***	-0.0001***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)
High School	0.1359***	0.1873***	0.0139***
	(0.0086)	(0.0098)	(0.0052)
Some College	0.2176***	0.2893***	0.0250***
	(0.0104)	(0.0108)	(0.0062)
Bachelor's Degree	0.2558***	0.3515***	0.0542***
	(0.0102)	(0.0094)	(0.0051)
Advanced Degree	0.3476***	0.3889***	0.0637***
	(0.0102)	(0.0098)	(0.0051)
Child under 13	-0.0566***		-0.0023
	(0.0045)		(0.0016)
COVID Case Rate (per 1M)	0.0000	0.0000	-0.0000***
	(0.0000)	(0.0000)	(0.0000)
COVID Death Rate (per 1M)	-0.0000	0.0000	0.0000**
	(0.0000)	(0.0000)	(0.0000)
Share of School Closures	-0.0253*	-0.0158	-0.0076
	(0.0141)	(0.0111)	(0.0114)
State Fixed Effects	Yes	Yes	Yes
Region-Year-Quarter Fixed Effects	Yes	Yes	Yes
Indicators for Race	Yes	Yes	Yes
Number of Children	Yes	N/A	Yes
Indicator for Married	No	Yes	No
Indicator for Metro Area	Yes	Yes	Yes
R^2	0.094	0.074	0.017
N	496,613	684,948	464,419

Notes: Sample includes individuals ages 25-54 surveyed in the monthly CPS from M1:2018 through M6:2023. Standard errors are clustered at the state-level. Statistical significance at the 1%, 5%, or 10% levels is indicated by ***, **, and *, respectively.

Table A3: Effects of Municipal Restrictions on Employed, At Work

	(1) Married Women with Children	(2) Women without Children	(3) Married Men with Children
Restrictions ×Post	-0.0155**	0.0000	0.0022
	(0.0074)	(0.0036)	(0.0039)
Age	0.0490***	0.0041***	0.0105***
	(0.0032)	(0.0012)	(0.0016)
Age-Squared	-0.0006***	-0.0001***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)
High School	0.1323***	0.1854***	0.0257***
	(0.0070)	(0.0096)	(0.0067)
Some College	0.2079***	0.2850***	0.0435***
	(0.0094)	(0.0103)	(0.0072)
Bachelor's Degree	0.2438***	0.3543***	0.0827***
	(0.0093)	(0.0097)	(0.0062)
Advanced Degree	0.3264***	0.3947***	0.0935***
	(0.0100)	(0.0093)	(0.0067)
Child under 13	-0.0591***		-0.0055***
	(0.0047)		(0.0017)
COVID Case Rate (per 1M)	-0.0000	0.0000	-0.0000***
	(0.0000)	(0.0000)	(0.0000)
COVID Death Rate (per 1M)	-0.0000	0.0000	0.0000***
	(0.0000)	(0.0000)	(0.0000)
Share of School Closures	-0.0165	-0.0289*	-0.0268
	(0.0214)	(0.0157)	(0.0165)
State Fixed Effects	Yes	Yes	Yes
Region-Year-Quarter Fixed Effects	Yes	Yes	Yes
Indicators for Race	Yes	Yes	Yes
Number of Children	Yes	N/A	Yes
Indicator for Married	No	Yes	No
Indicator for Metro Area	Yes	Yes	Yes
R^2	0.085	0.068	0.022
N	496,613	684,948	464,419

Notes: Sample includes individuals ages 25-54 surveyed in the monthly CPS from M1:2018 through M6:2023. Standard errors are clustered at the state-level. Statistical significance at the 1%, 5%, or 10% levels is indicated by ***, **, and *, respectively.

Table A4: Effects of Municipal Restrictions on Employment

	(1) Married Women with Children	(2) Women without Children	(3) Married Men with Children
Restrictions ×Post	-0.0134*	-0.0005	0.0003
	(0.0069)	(0.0032)	(0.0037)
Age	0.0452***	0.0037***	0.0097***
	(0.0028)	(0.0012)	(0.0016)
Age-Squared	-0.0005***	-0.0001***	-0.0001***
	(0.0000)	(0.0000)	(0.0000)
High School	0.1359***	0.1907***	0.0257***
	(0.0078)	(0.0096)	(0.0063)
Some College	0.2218***	0.2960***	0.0441***
	(0.0106)	(0.0102)	(0.0069)
Bachelor's Degree	0.2662***	0.3673***	0.0816***
	(0.0106)	(0.0094)	(0.0061)
Advanced Degree	0.3622***	0.4121***	0.0940***
	(0.0105)	(0.0094)	(0.0067)
Child under 13	-0.0582***		-0.0041**
	(0.0048)		(0.0015)
COVID Case Rate (per 1M)	0.0000	0.0000	-0.0000***
	(0.0000)	(0.0000)	(0.0000)
COVID Death Rate (per 1M)	-0.0000	0.0000	0.0000***
	(0.0000)	(0.0000)	(0.0000)
Share of School Closures	-0.0432***	-0.0453***	-0.0326*
	(0.0156)	(0.0142)	(0.0168)
State Fixed Effects	Yes	Yes	Yes
Region-Year-Quarter Fixed Effects	Yes	Yes	Yes
Indicators for Race	Yes	Yes	Yes
Number of Children	Yes	N/A	Yes
Indicator for Married	No	Yes	No
Indicator for Metro Area	Yes	Yes	Yes
R^2	0.099	0.076	0.026
N	496,613	684,948	464,419

Notes: Sample includes individuals ages 25-54 surveyed in the monthly CPS from M1:2018 through M6:2023. Standard errors are clustered at the state-level. Statistical significance at the 1%, 5%, or 10% levels is indicated by ***, **, and *, respectively.

Table A5: Effects of Municipal Restrictions on Hours Worked Last Week

	(1) Married Women with Children	(2) Women without Children	(3) Married Men with Children
Restrictions ×Post	0.1290	-0.0332	-0.1426
	(0.1437)	(0.1461)	(0.0878)
Age	0.5212***	0.4804***	0.1133*
	(0.0744)	(0.0388)	(0.0599)
Age-Squared	-0.0059***	-0.0057***	-0.0012*
	(0.0009)	(0.0005)	(0.0007)
High School	1.7328***	1.4919***	1.4786***
	(0.3211)	(0.1936)	(0.2464)
Some College	1.6440***	2.2206***	2.0931***
	(0.3954)	(0.2522)	(0.2668)
Bachelor's Degree	2.3212***	3.5154***	1.7391***
	(0.4091)	(0.2027)	(0.2436)
Advanced Degree	4.0794***	4.9946***	2.4541***
	(0.3193)	(0.2071)	(0.2579)
Child under 13	-1.1336***		-0.4363***
	(0.1225)		(0.1266)
COVID Case Rate (per 1M)	0.0000***	-0.0000	-0.0000*
	(0.0000)	(0.0000)	(0.0000)
COVID Death Rate (per 1M)	-0.0003*	0.0001	0.0001
	(0.0002)	(0.0001)	(0.0001)
Share of School Closures	0.8800	0.7169	-1.1614*
	(0.5546)	(0.4790)	(0.6057)
State Fixed Effects	Yes	Yes	Yes
Region-Year-Quarter Fixed Effects	Yes	Yes	Yes
Indicators for Race	Yes	Yes	Yes
Number of Children	Yes	N/A	Yes
Indicator for Married	No	Yes	No
Indicator for Metro Area	Yes	Yes	Yes
R^2	0.028	0.021	0.021
N	329,100	500,632	418,916

Notes: Sample includes individuals ages 25-54 surveyed in the monthly CPS from M1:2018 through M6:2023. Standard errors are clustered at the state-level. Statistical significance at the 1%, 5%, or 10% levels is indicated by ***, **, and *, respectively.

Table A6: Effects of Municipal Restrictions on Labor Outcomes, Washington Excluded

	(1) Labor Force Participation	(2) Employed, At Work	(3) Employed, Any	(4) Hours Last Week
Panel A: Married Women with Children				
Restrictions $\times Post$	-0.0135*	-0.0200***	-0.0167**	0.0802
	(0.0078)	(0.0073)	(0.0071)	(0.1548)
R^2	0.096	0.086	0.100	0.028
N	485,717	485,717	485,717	322,202
Panel B: Women without Children				
Restrictions $\times Post$	0.0016	-0.0008	-0.0005	0.0398
	(0.0039)	(0.0039)	(0.0036)	(0.1525)
R^2	0.075	0.069	0.076	0.021
N	671,074	671,074	671,074	490,395
Panel C: Married Men with Children				
Restrictions $\times Post$	0.0019	0.0009	-0.0008	-0.0997
	(0.0034)	(0.0043)	(0.0040)	(0.0888)
R^2	0.017	0.022	0.026	0.021
N	454,172	454,172	454,172	409,805

Notes: The treatment variable is a dummy for persons (aged 25 to 54) living in states with municipal restrictions in 2020-2021. All regressions include state effects and region by time effects. Individual control variables include age, race (Black Non-Hispanic, other Non-Hispanic, and Hispanic), education (less than high school, some college, bachelor's degree, advanced degree), metro status, marital status, number of children in the household and an indicator for child under 13. State COVID-19 controls include a continuous measure of cumulative cases and deaths per capita along with a control for school closures. Observations are weighted using CPS sample weights. Robust standard errors are clustered at the state level. Significance at 1%, 5%, and 10% levels are indicated by ***, **, and *, respectively.