Telework, Wages, and Time Use in the United States*

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Abstract: Remote work is rapidly increasing in the US. Using data on full-time wage and salary workers from the 2017–2018 American Time Use Survey Leave and Job Flexibilities Module, we estimate hourly wage differentials between teleworkers and office workers and compare how teleworkers and office workers allocate their time on office days and work-at-home days. Using an econometric method that relates selection on observables with selection on unobservables, we find that some teleworkers earn a wage premium, but it varies by occupation, gender, parental status, and teleworking intensity. In all subsamples, male, but not female, home-based teleworkers earn a wage premium. Among occasional teleworkers, we find a wage premium for all subsamples with the exception of mothers and men without children. Using time diaries, we find that teleworkers spend less time on commuting and grooming activities but more time on leisure and household production activities and more time with family on work-at-home days than office days. We do not find differences in workers' hours on average by telework status, but male teleworkers regardless of their work location on their diary day work slightly fewer minutes on weekday workdays than office workers.

Keywords: remote work, working from home, telework, wages, time use, commuting

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1. Introduction

Remote work has been rising steadily in the US over the past two decades, propelled by advances in communications technology and an expansion of high-speed internet services. According to the 2017–2018 American Time Use Survey Leave and Job Flexibilities (ATUS-LV) module, 25 percent of wage and salary workers did some work at home while 13 percent of workers worked exclusively from home at least once every two weeks (U.S. Bureau of Labor Statistics 2019). Following the declaration of the World Health Organization (WHO) on March 11, 2020 that the novel coronavirus (COVID-19) outbreak was a pandemic, many workers were pushed into home offices, at least temporarily, in an attempt to slow the spread of the virus.[1] By early May 2020, 35 percent of employed persons reported that they had worked from home at some point in the past month because of the pandemic, suggesting that telework rose substantially from its pre-pandemic level (U.S. Bureau of Labor Statistics 2020).[2] Many experts believe that this dramatic relocation of work from office to home due to the pandemic will have a lasting impact on the location of work. Dingel and Neiman (2020) estimate that up to 37 percent of all US jobs held at the beginning of 2020 could feasibly be done entirely from home, while Barrero, Bloom, and Davis (2020) predict that 22 percent of all full workdays will be supplied from home after the pandemic ends. This shift is likely to be permanent, especially for high-income earners, because of better-than-expected experiences working from home during the pandemic, investments in physical and human capital enabling working from home, reluctance to

[1] In the first week after physical distancing measures were implemented, Microsoft reported that their Teams app had 12 million additional users per day (Timberg et al. 2020).

[2] Numerous real-time surveys also document the dramatic increase in WFH in the US as a result of the pandemic (see, for example, Adams-Prassl, Boneva, Golin, and Rauch 2020; Bartik, Cullen, Glaeser, Luca, and Stanton 2020; Bick, Blandin, and Mertens 2020; Brynjolfsson, Horton, Ozimek, Rock, Sharma, and Ye 2020).

return to pre-pandemic activities, innovation supporting working from home and diminished stigma. Thus, the post-COVID-19 era will likely be the era of telework.

Telework (also referred to as telecommuting or remote work) is a formal or informal arrangement that allows workers to work from home or another location other than a traditional workplace. It is very often combined with the option to vary one's hours of work over the course of the day or week. The flexibility allowed by telework can possibly improve worker and family well-being if the time that would have been spent commuting can be devoted to more useful or enjoyable activities, such as social interactions, household production or child care. Parents who work from home report that their number one reason for doing so is to coordinate their work schedule with their personal or family needs (Woods 2020). To the extent that working from home (WFH) makes workers happier and allows them to better balance their work and home responsibilities, it can lead to higher productivity and higher wages. WFH can also lead to higher productivity if workers are better able to concentrate on their job tasks in a home setting rather than an office setting, or they are more alert or rested because they have eliminated their taxing commutes and/or reallocated some of their time to sleeping or relaxing leisure activities. On the other hand, employees who choose to work from home may be different in both observable and unobservable ways from those who work at a traditional workplace, and some may be willing to accept lower wages in exchange for location and schedule flexibility.

In this paper, we ask the following two questions: (1) What is the impact of teleworking on wages? and (2) Do the time-use patterns of teleworkers and office workers vary in a way that could explain observed differences in wages by telework status? For our analyses, we use data on full-time wage and salary workers from the 2017–2018 ATUS-LV Module, which for the first time added questions about teleworking frequency to the ATUS data. This module allows us to determine whether a worker can work some or all of their workdays exclusively from home. In our analyses, we divide regular teleworkers into two groups based on whether they work three or more days a week exclusively from home. We refer to these teleworkers as home-based teleworkers and occasional teleworkers. When we refer to office workers, we mean workers whose location of work is at a traditional workplace for their occupation and industry, which is not necessarily an office setting. In addition, office workers do not work days exclusively from home on a regular basis.

To investigate whether home-based and occasional teleworkers earn a wage premium or pay a wage penalty, we use an econometric technique that relates selection on observables to selection on unobservables in order to place bounds on the true causal effects of teleworking on wages. To answer the second question, we first use time-diary data from the ATUS-LV module to compare conditional mean time use and the timing of daily activities on weekday workdays for teleworkers on home days versus office days, and also to compare teleworkers to office workers. This approach allows us to examine how teleworkers choose to reallocate their time savings when they work from home, and which activities they value most. We also examine all days to compare how time-use patterns vary among home-based teleworkers, occasional teleworkers, and office workers in order to investigate whether teleworkers differ from office workers in the way that they spend their time over the week.

We find that some teleworkers earn a wage premium, but the magnitude of the wage premium varies by gender, parental status, major occupation group, and intensity of teleworking. On average and regardless of parental status or occupation group, male home-based teleworkers earn more than office workers, but female home-based teleworkers do not earn a wage premium.

Among occasional teleworkers, we find a wage premium for all except mothers and men without children.

On WFH days, male and female teleworkers gain a significant time windfall due to a reduction in time spent on commuting and grooming activities. They spend some of this time watching TV and using the computer for leisure. However, there are also some differences by gender. On WFH days, male teleworkers spend more time preparing food and enjoying meals. Fathers also spend more time doing child care and more overall total time with their children, and married men spend more time with their partner. Females, on the other hand, spend more time on all household production activities. Mothers also spend more total time with their children, but not with their partner, nor do they increase their primary child care time.

We also find evidence that teleworkers are shifting some of their activities between workdays and non-workdays, so that on the average day teleworkers and office workers spend similar amounts of time on most activities. However, home-based teleworkers still gain a statistically significant amount of time by decreasing commuting and grooming time, and occasional female teleworkers gain some time by decreasing grooming time. Among mothers, home-based teleworkers spend more time with their children than office workers on the average day. Among fathers, home-based teleworkers spend more time on primary child care than office workers on the average day.

We find that most workers are working from 9 to 5, regardless of their telework status. However, we do find evidence that teleworkers have greater flexibility in scheduling their hours on their WFH day. Fathers spend more time in the hours before and after school with their children and females spend more time on household production during core working hours. Workers also differ in terms of the timing of their leisure activities. Finally, there are some differences in sleep schedules on WFH days versus office days, with teleworkers rising later in the morning on their WFH days. Overall, these findings on time use and the timing of activities suggest that teleworking enables families to better balance work and family responsibilities.

2. Background

2.1 Wage Effects of Telework

There are various hypothesized ways that telework may affect wages. Teleworkers who spend less time commuting may be happier, less tired, and therefore more productive. Commuting to work is one of the least enjoyable daily activities (Kahneman et al. 2004; Kahneman and Krueger 2006), and thus eliminating it would increase happiness. Golden, Henly, and Lambert (2013) and Kim, Henly, Golden and Lambert (2020) find a positive relationship between flexible schedule control, WFH as part of normal working hours, and worker happiness and job satisfaction. Furthermore, worker happiness is tied to productivity (Oswald, Proto, and Sgroi 2015). Song and Gao (2020) also show that workers who work from home are less tired compared to those who work in the office, perhaps either because commuting is tiring or because they are able to use the time that they would have spent commuting to get more sleep. More time sleeping would have a positive effect on productivity and wages (Gibson and Shrader 2018; Groen and Pabilonia 2019). It is also possible that worker productivity is higher while WFH if workers face fewer interruptions or distractions from co-workers (Global Workplace Analytics 2020b).

A few randomized-controlled trials provide evidence that WFH can be more productive than working in the office, at least for some workers. For example, Bloom, Liang, Roberts and Ying (2015) randomly assigned employees at a large Chinese travel company to work from home. They find that the home-based teleworkers are more productive, have fewer unscheduled absences and lower quit rates than their office counterparts. In a random experiment at a large Italian company, Angelici and Profecta (2020) find that once-a-week teleworkers are more productive and have fewer absences, with stronger effects for women. In another experiment, Dutcher (2012) shows that worker productivity is higher for creative tasks, but not routine tasks, done from home.

On the other hand, productivity could be negatively impacted if teleworkers are more likely to experience stress and mental health problems due to their inability to separate home and work responsibilities (Mann and Holdsworth 2003). During core work hours, children and other family members may call for attention or teleworkers may be distracted by household chores. Their work may also spill over into non-traditional work hours and cause conflicts with other family members. Teleworkers with competing demands on their time may also shirk while on the clock.

Along with differences in productivity, wages may reflect incentive pay and compensating differentials for the costs of maintaining office space and for monitoring costs. From an employer's standpoint, telework arrangements are easier to implement when workers do not require costly supervision or coordination, where teamwork is less important and output can be easily measured, and in jobs where workers have a high degree of autonomy. If monitoring is costly, managers may grant telecommuting rights to their most trusted and highly productive workers, who have a lower propensity to shirk. Alternatively, they may pay efficiency wages to elicit greater effort when monitoring is problematic. In areas where office space is more expensive, employers have an additional incentive to encourage work from home with monetary incentives. On the other hand, employers who place a higher value on teamwork may encourage on-site presence with higher wages or promotions, leading to lower wage trajectories for teleworkers even with no difference in productivity (Rhee 2008; Bloom, Liang, Roberts and Ying 2015; Glass and Noonan 2016).

Among all flexible workplace practices, work location flexibility is one of the most highly valued by workers, and many workers are willing to accept lower wages for the option to work from home (Mas and Pallais 2017; He, Neumark and Weng forthcoming; Maestas, Mullen, Powell, von Watcher and Wenger 2018). Workers may value WFH because WFH days could allow couples to better coordinate joint leisure, and allow parents to spend more time with their children (Hamermesh 2002; 2020). In addition, by eliminating the commute, they save on the monetary costs of travel and prepared foods (Global Workplace Analytics 2020a).

Policy activists often advocate expansion of flexible location arrangements as a way to keep mothers attached to the labor force. If so, telework has the potential to lead to higher earnings for women and reduce the gender pay gap and the motherhood wage penalty. However, if women view WFH as a job amenity while men see it as a demand of the job, men may select themselves into jobs that pay a premium for WFH while women may accept lower pay in exchange for location flexibility, and therefore WFH could increase the gender wage gap (Maestas et al. 2018; Kleven, Landais, and Søgaard 2019).

Whether teleworking leads to higher or lower wages is ultimately an empirical question. Prior studies provide mixed evidence on the wage effects of WFH in the US, though they vary in how they classify teleworkers, with some including those bringing supplemental work home from the office to catch-up on unfinished projects in the evenings and others examining only home-based teleworkers. Most are cross-sectional in nature and do not account for selection effects. Using the 2001 and 2004 Current Population Survey Work Schedules and Work at Home (CPS-WS) Supplements, Weeden (2005) finds a positive relationship between flexible work arrangements and wages, with higher wage premiums in non-manual occupations. Using the 2001 CPS-WS Supplement, Gariety and Shaffer (2007) show wage premiums associated with WFH in some industries, but wage penalties in other industries. They attribute the negative wage differentials as being driven by preferences for WFH and the positive differentials as being driven by WFH being more productive, either as a result of selection by employers or from workers being able to be more productive while WFH. Using the Decennial Censuses, Oettinger (2011) documents wage penalties in the 1980 and 1990 censuses, and a small wage premium in the 2000 census for home-based workers. Between 1980 and 1990, the wage penalties fell fastest in IT-intensive occupations. More recently, using ACS and Decennial Census data and controlling for selection using a Heckman selection model, White (2019) finds that home-based workers went from paying a 26 percent wage penalty in 1980 to earning a 5 percent wage premium in 2014.

2.2 Telework and Time Use

To examine how WFH is associated with work and non-work time-use patterns, a few studies (Wight and Raley 2009; Eldridge and Pabilonia 2010; Genadek and Hill 2017) use data on matched respondents from the 2004 CPS-WS Supplement and the 2004–2005 ATUS. Although teleworkers can be identified in the supplement, the matched sample is much smaller than the new ATUS-LV module sample due to job turnover between the final CPS interview and the ATUS interview occurring 2–5 months later, and it covers only a portion of the year (July 2004 to January 2005) whereas the ATUS-LV module covers most days over a two-year period. In addition, WFH was not as prevalent in 2004 as it was in 2017–2018.[3] Using the matched

[3] We estimate that, in 2004, 15 percent of wage and salary workers in the US reported that they did some work at home, but only 3 percent of workers worked exclusively at home at least one day every two weeks (Current

sample, Wight and Raley (2009) find that women who ever work from home spend less time doing market work than those who do not work from home. They also find that fathers who ever work at home spend less time on primary child care. More recently, Genadek and Hill (2017) examine differences in parents' time with children under the age of 13 between different workplace flexibility measures and find that mothers, but not fathers, who have work location flexibility spend more total time with their children (almost 50 minutes more) than mothers who do not work from home. Neither Wight and Raley (2009) nor Genadek and Hill (2017) distinguish in their analyses between work-at-home days and work brought home from the office and done in the evening; however, Eldridge and Pabilonia (2010) surmise that the majority of the work done at home in 2004 was work brought home from the office and done in the evening or over the weekend.

A couple of studies (Giménez-Nadal, Molina and Velilla 2019; Song and Gao 2020) use ATUS data prior to the release of the ATUS-LV module to examine the relationship between working from home and workers' subjective well-being. However, these studies could not determine whether workers were WFH on an occasional basis or for the majority of their workdays or just bringing work home from the office on their diary day, nor could they identify all teleworkers from the location of work on the respondents' single diary day. Giménez-Nadal, Molina and Velilla (2019), however, find that working exclusively from home on the diary day results in a shift from market work activities to non-market work and leisure activities during core working hours.

Using the new ATUS-LV module, Restrepo and Zeballos (2020) find that among all prime-age white-collar workers, those who work at home on their weekday diary day spend less

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Population Survey Data at NBER 2004). For additional findings from this supplement, see U.S. Bureau of Labor Statistics (2005).

time working, commuting and on personal care, but more time on leisure, in food production and sleeping. Also, using the ATUS-LV module, Frazis (2020) examines the characteristics of all wage and salary workers who are ever paid to work exclusively at home on their workday, and studies the effects of WFH on workers' time allocation. He finds that teleworkers reallocate time from commuting and grooming activities to leisure activities and sleep and that secondary child-care time increases. We examine full-time, non-agricultural wage and salary workers and classify workers based on their frequency of teleworking. We do not require workers who telework on a regular basis to also report being paid for their work at home, although 89 percent of the teleworkers in our sample do state that they are being paid for work done from home, because all workers are compensated for their work (which is their reason for working) even if it is delayed compensation in terms of a promotion (Song 2009).[4] We consider only full-time workers in order to examine the effects of location flexibility on time use and wages for workers who have more similar usual hours worked per week. In addition, we examine workers separately by gender, given the large differences in both time allocation and occupations held by men and women (Aguiar and Hurst 2007; Blau and Kahn 2017).

3. Data and Descriptive Statistics

3.1 Data

For our analyses, we use information about wage and salary workers' job flexibility and work schedules on their main jobs collected as part of the 2017–2018 ATUS LV Module as

[4] For example, an educator may work certain contractual hours in a school building and may consider their Sundays spent grading each week as unpaid even if those hours are part of their usual/customary hours worked. On Sundays, they may have a choice to work in the workplace or work exclusively at home. Thus, our analysis focuses on flexibility in the location of work.

well as information collected as part of the main ATUS interview and time diary.[5] The main ATUS sample consists of a sample of people living in households that have completed their final CPS interview occurring 2-5 months earlier. Only one respondent per household is interviewed; however, the ATUS contains a household roster and demographic and labor market information for each respondent and all other household members, including age, education, employment, earnings and usual weekly hours worked. In addition, one retrospective time diary is collected where the respondent sequentially details how she spends her time over a 24-hour period starting at 4 a.m. on the day prior to the interview (start and stop times are reported for each activity). Activities are coded into detailed categories and, for most activities, both the location of the activity and who else was present during the activity are also available, with the exception of sleep and personal care activities. Only the respondents' primary activities are collected, with the exception of secondary child care. We examine major time use categories, including work and work-related activities, travel time, personal care, household production, caregiving activities and leisure activities as well as important subcategories, such as commuting, and summary measures of time with family, friends and coworkers (Appendix Table A1 details how we group activities into mutually-exclusive categories). Half of ATUS respondents are surveyed about a weekday and the other half about a weekend day. We use the LV module final weights throughout our analyses. The main advantage of the new ATUS-LV module is that it provides information on WFH feasibility for main jobs that allows us to distinguish between home-based and occasional teleworkers as well as office workers in a nationally representative dataset. It also allows us to examine non-market work activities and the timing of activities by WFH status. The

[5] Code for replication can be found here: http://doi.org/10/5281/zenodo.4381047. The data is available at https://www.bls.gov/tus/lvdatafiles.htm (U.S. Bureau of Labor Statistics 2017–2018). For additional findings from the LV Module, see U.S. Bureau of Labor Statistics (2019).

main drawback is that time diary data are available for only one person per household on a single day; therefore, we are unable to analyze the impact of telecommuting on spousal time allocation, with the exception of couple time together, nor can we compare WFH days to office workdays for the same workers.

We restrict the sample to full-time, non-agricultural wage and salary workers aged 18–64 who usually work at least 35 hours per week on their main job, because we want to be able to compare workers' time allocation on typical workdays by work location and estimate wage differentials for workers with similar hours. We define a "home-based teleworker" as a worker who works exclusively at home three or more days a week, and an "occasional teleworker" as a worker who works exclusively at home at least once a month and at most two days a week.[6] An "office worker" is a worker who either never works exclusively from home or works exclusively at home less than once a month.

Our sample consists of 341 home-based teleworkers, 844 occasional teleworkers, and 6,870 office workers, or 4 percent, 9 percent and 87 percent of sample workers, respectively. About 28 percent of all workers in our sample do some work from home, but only 13 percent report regularly working entire days exclusively at home as part of their main job (at least once a month). Although 4 percent are classified as home-based teleworkers, many home-based teleworkers still go into the office on occasion, with 2.2 percent of full-time workers typically

[6] Note that our definition of home-based teleworker corresponds closely with the home-based worker definition derived from the ACS, which asked respondents "How did this person usually get to work LAST WEEK?" If a respondent answers that they "worked at home," then they are classified as a home-based worker. In 2019, the ACS changed the phrase "worked at home" to "worked from home" to better reflect how workers refer to this option (U.S. Census Bureau 2017).

working 5 or more days a week at home and 1.8 percent typically working 3–4 days a week at home.[7]

Around 90 percent of teleworkers report that they also have flexible hours defined as the ability to frequently change the time they begin and end their workday, while only half of office workers report the same.[8] When asked whether they can change the time that they begin and end work on a frequent basis (as opposed to occasionally or rarely), about half of all teleworkers but only 14 percent of office workers report that they can. Over 93 percent of teleworkers report working daytime schedules between 6 a.m. and 6 p.m., compared to 85 percent of office workers. In addition, a higher percentage of teleworkers have a regular Monday-Friday work schedule, over 80 percent compared to 71 percent among office workers.

3.2 Descriptive Statistics

Figure 1 illustrates the prevalence of telework (home-based plus occasional) by detailed occupation group. The highest share of teleworkers by far is among computer and mathematical scientists (about 42 percent). Between 20 and 30 percent of workers working in 1) management, 2) art, design, entertainment and sports, 3) life, physical, and social science, 4) business and financial operations, and 5) legal occupations are regular teleworkers. On the other hand, occupations such as 1) food preparation, 2) production, 3) installation, maintenance, and repair, and 4) transportation and material moving have barely any teleworkers. Figure 2 illustrates the

[7] Workers were asked how many days they work per week. Among home-based teleworkers who work 5+ days a week at home, they work about 0–0.22 days in the office, while those who work 3–4 days a week at home work between 1.32 and 2.32 days in the office.
[8] See Mas and Pallais (2020) for a review of alternative workplace arrangements and different surveys that measure their prevalence.

incidence of telework by major industry group. Business and professional services, information, and financial industries have the greatest shares of teleworkers, with almost 28 percent each.[9]

In Table 1, we compare the mean demographic and job characteristics across our three worker types, separately by gender. Although not reported in Table 1, we do not find any difference in the share of workers who work from home by gender, overall or by the intensity of teleworking. On average, teleworkers are more educated, more likely to be partnered, have a spouse/partner who is employed, be non-Hispanic white, be born in the United States, live in a metropolitan area and earn higher wages. They are less likely to be Hispanic, paid by the hour, belong to a union, or have a government sector job than office workers. Home-based male teleworkers are more likely to be older but less likely to have a disability than office workers. Occasional teleworkers are less likely to be black but more likely to be Asian and have an elderly person living in the household. Occasional teleworkers are more likely than office workers to have own children under the age of 18. Home-based male teleworkers are more likely than male office workers to have own school-age children. Home-based female teleworkers are less likely than female office workers to have own children under the age of 6. Home-based female teleworkers are more likely to be paid by the hour and earn lower wages than occasional female teleworkers.

In our sample, professional and technical occupations and managers are overrepresented among teleworkers (around 80% of teleworkers are in these fields, whereas fewer than half of on-site workers are in these occupations). The opposite is true for production, service and support occupations, which together employ half of male workers and 22 percent of female

[9] We note that even though the share of teleworkers in the natural resources and mining industry group is relatively large, only 1 percent of respondents in our sample belong to this group.

workers but account for less than 7 percent of teleworkers. Sales and administrative support occupations are also underrepresented, although to a smaller extent, among female teleworkers.

In terms of industries, business and professional services, finance, insurance, real estate and information are overrepresented among teleworkers, whereas construction, wholesale and retail trade, and leisure and hospitality are underrepresented. Education and health, the industry that employs the largest share of women in our sample, accounts for 43 percent of on-site female workers and only 28 percent of female teleworkers. While the prevalence of home-based and occasional telework may differ by occupation and industry, our sample shows only three statistically significant differences by intensity: 1) occasional male teleworkers are more likely to be in managerial occupations, 2) home-based male teleworkers are more likely to be in public administration and 3) home-based female teleworkers are more likely to be in sales and support occupations.

4. Methodology and Results

4.1 Does Teleworking Lead to Higher or Lower Wages?

To estimate the magnitude and direction of the relationship between teleworking and wages by teleworking intensity, we first estimate log hourly wage regressions using ordinary least squares (OLS) as follows:

$$\log W_i = \alpha + \beta_1 \, \textit{Home-based teleworker}_i + \beta_2 \, \textit{Occasional teleworker}_i + \beta_3 X_i + \varepsilon_i \qquad (1)$$

where the dependent variable, $\log W_i$, is the natural logarithm of the usual hourly wage on the main job. When the hourly wage is not reported (45 percent of respondents), it is calculated by dividing usual weekly earnings by usual weekly hours (excluding overtime). We multiply the top-coded hourly wages and earnings value by 1.5, a common practice in the literature (e.g., Autor, Katz, and Kearney 2008). Wages have been adjusted to 2018 dollars using the CPI-U. *Home-based teleworker*$_i$ and *Occasional teleworker*$_i$ are indicators for the category of teleworker as defined previously; X_i includes controls for the demographic and job characteristics of individual i; α is a constant term; β_1 and β_2 are the coefficients of interest; and ε_i represents the error term. Vector X_i includes a quartic polynomial in age and indicator variables for race and ethnicity (non-Hispanic black, non-Hispanic Asian, Hispanic), presence of a spouse or partner, spouse or partner is employed, education (some college, college, graduate degree), children age 0–5, children age 6–17, presence of another adult age 18–69, an elderly person age 70+ in the household, foreign born, has a disability, Census region residence (Midwest, Northeast, West), metropolitan residence, paid hourly, union member, government sector job, survey year, 9 industries and 4 occupations.[10] Given the potential for heterogeneous effects across workers, we also estimate separate regressions by parental status, and then for three major occupation categories (we collapse services and support, sales and administrative support, and production workers into one category because of the small number of teleworkers in these occupations).

All existing studies, including this one, acknowledge the difficulty of disentangling a causal relationship between wages and work location. Our OLS estimates may be biased due to unobserved worker or firm heterogeneity that is correlated with both wages and telework status. For example, individuals with better negotiation skills or advanced computer training may be more likely to work at home and also receive higher wages. In this case, the coefficients on the telework indicators in the OLS wage regressions would combine the effects of WFH with the impact of these skills on wages, and thus will overestimate the true impact of remote work on

[10] Children includes own household and non-household children listed on the ATUS household roster. This can include household stepchildren. We tried to use more detailed occupation categories, but the sample of teleworkers in some occupations is too thin.

wages. As a final example, Briscoe, Wardell, and Sawyer (2011) find a positive association between workplace size and the probability of WFH among high-skilled IT workers. Because larger firms pay higher wages than smaller firms (Bloom, Guvenen, Smith, Song and von Wachter 2018), our OLS estimates are again likely to be biased upward.

Therefore, we also estimate Oster (2019) bounds on the true causal effects. This econometric technique first introduced by Altonji, Elder and Taber (2005) but recently popularized by Oster (2019) relates selection on observables to selection on unobservables using changes in estimated coefficients when observables are included in the model along with an assumption about the relative effect on coefficient stability of including observables versus unobservables. We assume that the selection bias from the observables and the selection bias from the unobservables are proportional ($\delta = 1$) and have the same sign.

Tables 2A and 2B present our OLS coefficient estimates, adding controls successively to show that the estimates are potentially subject to omitted variable bias. In column 1 of Panel A with no controls, we find that the average teleworker earns statistically significantly higher wages, with male home-based teleworkers earning substantially more than male office workers in comparison to the wage premium earned by female home-based teleworkers (84 percent for males and 29 percent for females).[11] When we add controls for demographic characteristics in column 2, the coefficients are reduced in magnitude by more than half. In addition, the R-squared term increases from 0.1 to 0.4. In the final specification, we add controls for job characteristics. The R-squared term increases slightly from 0.4 to 0.5. Again, however, the estimated coefficients fall substantially for males (20 percent wage premium); and for female home-based teleworkers, the coefficient on the home-based teleworker indicator is now negative

[11] $(e^{\beta} - 1)*100$ is the percentage change in the wage due to a unit change in the indicator variable.

and not statistically significant. The coefficient on the occasional teleworker indicator is still significant in column 3, indicating a 15 percent wage premium for occasional male teleworkers and a 19 percent wage premium for occasional female teleworkers.

These results showing the strong effects of selection based on observables suggest that selection on unobservables is also likely to be an issue. Thus, in column 4, for our models with full controls, we report Oster betas, which represent the bias-adjusted estimates when $\delta = 1$ and $R_{max} = 1.3*\tilde{R}$ where $\tilde{R}$ is the estimated R-squared in each regression. Specifically, Oster betas, denoted by β^*, are calculated as:[12]

$$\beta^* = \tilde{\beta} - \delta[\dot{\beta} - \tilde{\beta}]\left(\frac{R_{max} - \tilde{R}}{\tilde{R} - \dot{R}}\right) \quad (2)$$

where $\tilde{\beta}$ and $\tilde{R}$ are the coefficient on the telework indicator and the R-squared from column 3 (full set of controls) and $\dot{\beta}$ and $\dot{R}$ are the coefficient on the telework indicator and the R-squared from a regression with no controls (including the other telework indicator).

Oster betas represent lower bounds in all but one specification, while the estimated coefficients in column 3 represent the upper bounds on the effect of telework on wages. When the Oster bounds include zero, the estimated effects are not robust to correcting for omitted variable bias, as is the case for some of our specifications. For the average worker, we find that male home-based teleworkers earn more than male office workers (a 7–20 percent wage premium), while female home-based teleworkers do not earn a wage premium. However, we find that female occasional teleworkers earn a wage premium of 4–19 percent. While the coefficient on occasional teleworker for the average male workers was statistically significant and indicates a 15 percent wage premium, the estimate is not robust to correcting for omitted variable bias. In

[12] These were estimated using the STATA command psacalc.ado (Oster 2013). Oster (2019) suggested that $R_{max} = 1.3*\tilde{R}$ was an adequate assumption based on a set of randomized control trials. She argued that an $R_{max} = 1$ is too high, especially if measurement error is likely.

a robustness check, we pool males and females and include an interaction between female and our teleworker indicators in the OLS regressions. The coefficient on the gender interaction term with home-based teleworker is negative, of approximately the same magnitude as the coefficient on home-based telework, and statistically significant, while the coefficient on the gender interaction term with occasional teleworker is not statistically significant and close to zero (see Appendix Table A.2).

Looking at the results by parental status in Panels B and C, we find that fathers who are home-based teleworkers earn 9–21 percent more than fathers who are office workers, and fathers who are occasional teleworkers earn 3–21 percent more than fathers who are office workers. Men without children who are home-based teleworkers earn 6–20 percent more than men without children who are office workers. The 10 percent wage premium for occasional teleworking among male workers without children is not robust to correcting for omitted variable bias. Women without children who are occasional teleworkers earn 10–23 percent more than women without children who are office workers; women without children who are home-based teleworkers do not earn a wage premium. Mothers who telework either most of their days or on occasion, however, earn no wage premium. These findings are consistent with the literature suggesting that women are more willing to pay for the option to work from home to better balance work and home responsibilities.

In Panels D-F, we examine the effects of teleworking by major occupation group. Across occupation groups, male teleworkers regardless of intensity earn a substantial wage premium that is robust to correcting for omitted variable bias. Male home-based teleworkers earn 20 percent more than office workers in management, business, and financial operations occupations, 14–17 percent more in professional and technical occupations, and 15–35 percent more in service, sales, administrative support and production occupations. Male occasional teleworkers earn 9–17 percent more than office workers in management, business, and financial operations occupations, 5–12 percent more in professional and technical occupations, and 7–19 percent more in service, sales, administrative support and production occupations.

Turning to female workers, we find no statistically significant coefficients on home-based teleworker. However, as occasional teleworkers, females earn more than office workers in management, business and financial operations occupations (15–24 percent wage premium) and services, sales, administrative support, and production worker occupations (14–27 percent wage premium). The coefficient on occasional teleworker is negative but not statistically significant in professional and technical occupations Therefore, we conclude that women do not earn higher wages for home-based telework, but most women who are not caring for children receive a wage premium for occasional telework.

4.2 Time-Use Patterns: Workdays

To examine differences in time-use patterns on home days versus office days for teleworkers and also between teleworkers by work location and office workers on typical workdays, we estimate minutes spent in daily activities on weekday workdays for respondents who work at least four hours.[13] Similar to Nätti, Tammelin, Anttila, and Ojala (2011), we control for various background characteristics that may result in differences in time allocation. Thus, we estimate the following models using OLS:[14]

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[13] We also explored including those who work at least 60 minutes on their diary day; however, the higher work time restriction leads to more similar mean working times across worker types/locations without a significant drop in observation counts.

[14] While not all workers report doing each activity on their random diary day, they likely all do these activities regularly. In this case, OLS models are appropriate.

$$Y_i = \beta_1 \textit{ Work at home day for teleworker}_i + \beta_2 \textit{ Work at office day for teleworker}_i + \beta_3 \textit{ Work at office day for office worker}_i + \beta_4 X_i + \varepsilon_i \quad (3)$$

where the dependent variable, Y_i, represents the total daily minutes spent in an activity (work, leisure, household production, child care, etc.) or with family, friends, co-workers/clients and alone; the *Work at home day for teleworker*$_i$ indicator equals one if the teleworker (due to the limited sample of WFH days we pool home-based and occasional teleworkers) worked at home for at least four hours and worked in the office for zero minutes, and zero otherwise (they may have also worked at another location besides their home such as visiting a client or working at a coffee shop). The *Work at office day for teleworker*$_i$ indicator equals one if the teleworker worked in the office for at least four hours and zero otherwise, and the *Work at office day for office worker*$_i$ indicator equals one if the office worker worked in the office for at least four hours and zero otherwise (they may have also taken work home); X_i is a vector of demographic and job characteristics as mentioned earlier (these regressions also include log hourly wage and month of interview indicators); and ε_i represents the error term.[15] These models omit the constant term.

In columns 1–3 of Tables 3A and 3B, we present conditional mean time spent for each activity, and then separately total time spent over the diary day with family, friends, coworkers/clients, and alone.[16] Note that time with children is the sum of all time spent on activities during which at least one own child under age 18 was present, including work time; consequently, the majority of time with children is secondary child care. Because these are

[15] We also estimate conditional means only conditioning on demographic characteristics (not shown); and the results are similar, suggesting omitted job characteristics other than work at home do not affect time allocation.

[16] We also examine all workdays when workers work at least four hours, and results are similar for the most part (Appendix Table A.3.A and A.3.B); however, we prefer to focus on weekdays, because teleworkers work primarily on weekdays and we may pick up some work brought home from the office by including weekend days in the analyses instead of focusing on typical workdays.

predicted means, the total minutes working at the workplace and commuting for teleworkers on home days are not zero, even though we defined home days as days with no work occurring in the office. In column 4, we indicate whether the conditional mean differences are statistically significant.

For males (Table 3A), we find that office workers spend 23 minutes longer on all work and work-related activities than teleworkers do on their office days and 36 minutes longer than teleworkers do on their WFH days. Teleworkers on their office days also do some work from home, and they work 17 minutes longer at home than office workers. This is probably because teleworkers all have a type of job where it is feasible to perform at least some work from home, which may not be the case for all office workers. Teleworkers and office workers on office days spend 63 and 57 minutes commuting to work, respectively; thus, teleworkers on WFH days gain about an hour from not having to commute.[17] In addition, they gain an additional 14 minutes on WFH days by reducing their time spent on grooming activities.

In terms of work-life balance, we find that male teleworkers who work from home on their diary day spend 12 more minutes engaged in food preparation and 13 minutes longer eating their meals than male teleworkers who work in the office on their diary day, or 10 and 23 more minutes respectively than male office workers. This difference could be because workers are eating more takeout food when they go to the office. Thus, teleworkers may be eating healthier overall as home-produced meals tend to be higher in nutrients and lower in calories than meals prepared elsewhere (Wolfson, Leung, and Richardson 2020). In addition, male teleworkers on WFH days spend more time caring for family members and pets than male office workers and teleworkers who work in the office on their diary day (17–19 minutes more). Fathers who

[17] We calculate commuting time using the trip tour methodology described in Kimbrough (2019).

telework spend 31 minutes more on primary child-care activities and almost 2 hours more time around their children in general on their WFH days than on their office days. Fathers who work from home on their workday sometimes have children in their presence while working (21 minutes more per day than office workers). This is unsurprising, because children's school hours are usually less than the hours worked each day by parents with full-time jobs. Male teleworkers also spend 43 minutes more watching TV and using computer activities for leisure and 17 minutes more on social activities on WFH days than on office days. They also spend statistically significantly more time with their spouse or partner on WFH days than do office workers and teleworkers on their office days (40–53 minutes more). Teleworkers on WFH days spend less time with their coworkers or clients (and consequently more time alone), but office workers and teleworkers on office days spend similar amounts of time with their coworkers and clients, suggesting that the level of teamwork and face-to-face interaction required for workers who telework and those who do not may be fairly similar on a daily basis.

For females (Table 3B), we find that teleworkers work 26 fewer minutes on WFH days than office days but the differences are not statistically significant. Teleworkers and office workers on their office days spend 52–57 minutes commuting to work; thus, female teleworkers on WFH days also experience a significant time windfall by eliminating their commutes. Going into the office requires almost an hour of grooming, but telework reduces daily grooming by 21 minutes.

In terms of work-life balance, we find that female teleworkers on WFH days spend substantially more time engaging in home production activities than on-site workers do (about 41 minutes more), including 27 minutes longer on housework and household management activities. Female teleworkers also enjoy 32 minutes more time on TV and computer activities on WFH days than office days. Mothers spend more time around their children in general on WFH days than office days (95 minutes more), and they spend more time with their children while WFH (33 minutes more). Mothers' time in primary child care, however, is not affected by work location. In fact, teleworking fathers spend more time in primary child care than teleworking mothers (68 versus 51 minutes). Teleworking mothers, however, have children in their presence to a greater extent than teleworking fathers during work episodes conducted from home (23 minutes difference). It is possible that this additional time spent working with children present could lead to mothers being less productive at work, which could explain the parental differences in wage premiums for female teleworkers. However, the total time spent working while watching children, 46 minutes, is still a small share of the 7 hours and 34 minutes average WFH day for a mother.[18] A more likely explanation for wage differences by parental status is the duration of work. Childless women in our sample have a longer workday when WFH, about 9 hours on average, while mothers work on average 7 hours and 50 minutes on office days. It is therefore possible that full-time employed mothers select themselves into less competitive jobs or jobs that do not require long hours thus forgoing compensation and promotion but gaining work-life balance.

Contrary to male teleworkers, female teleworkers do not spend more time with their spouse or partner on WFH days, which is likely because men’s wives work fewer hours than women’s husbands. However, similar to male teleworkers, female teleworkers spend less time with their coworkers and clients on WFH days but teleworkers and office workers spend similar amounts of time with coworkers/clients on office days. We find no statistically significant

[18] Average total hours worked for mothers and childless women are not shown because the sample sizes are small, only 44 mothers and 58 childless women who are teleworkers are observed WFH on their diary day.

differences in the amount of daily sleep by teleworking status for either men or women among full-time wage and salary workers.[19] Prior findings on sleep differences by telework status are likely due to the authors' inclusion of part-time workers. Overall, teleworkers on office days are similar to office workers (as shown in columns 2 and 3), except that office-based males spend 21 more minutes at work and male teleworkers spend 9 extra minutes eating.

4.3 Time-Use Patterns: All Days

Are teleworkers different in the ways that they allocate their time over the course the week? Do they prefer certain activities over others? Do they shift their activities from office days to home days or from workdays to non-workdays to create more balance in their lives? In a final model similar to equation 3, we predict time on an average day in 2017–2018 for our three groups of workers (home-based teleworkers, occasional teleworkers and office workers) conditional on their demographic and job characteristics and include additional controls for Saturday and Sunday/holiday time diaries.

For males (Table 4A), on the average day, we find no difference in total work time, suggesting neither overworking nor shirking of teleworkers. Home-based teleworkers spend less time commuting on the average day than office workers (18 minutes less). However, occasional teleworkers spend just as much time commuting as office workers, suggesting that the commute may be slightly longer for the former group, which de Vos, Meijers, and van Ham (2018) and de Vos, van Ham, and Meijers (2019) found to be true for some workers in the Netherlands (especially those living in moderately urban municipalities).[20] Home-based teleworkers, but not

[19] We also looked at conditional mean sleep time differences for non-parents who are not constrained by school bell schedules (results not shown), but we find no difference in total sleep time.

[20] Rhee (2008) argues that when telecommuting is adopted, workers may be more likely to choose to commute more to a distant workplace than to a nearby workplace. To further examine commuting time differences, we pool males and females due to the small sample size and similar commute times and estimate commute time on workdays with additional indicators to control for office workday and non-office workday for home-based workers, occasional teleworkers and office workers. We find that occasional teleworkers spend 5 minutes longer commuting to the office

occasional teleworkers, spend less time grooming (11–12 minutes less). Teleworkers spend slightly more time eating and drinking than office workers (9 minutes more). We do not find any differences in TV and computer use on the average day across worker groups, suggesting that men spend the same time watching TV, playing video games and engaging on social media, but teleworkers do more of these activities on their WFH weekdays whereas office workers shift them to non-workdays. Fathers who are home-based teleworkers spend 19 minutes more on primary child care than fathers with office-based jobs. Home-based teleworkers spend only78 minutes per day with coworkers/clients and over 8 hours of awake time alone, while an average office worker spends 4 hours and 40 minutes with coworkers/clients and 5 hours and 20 minutes alone. Occasional teleworkers are similar to office workers in that they spend 4 hours and 10 minutes with coworkers and 5 hours and 30 minutes alone on the average day.

For females (Table 4B), as in the case of males, total work time does not vary by teleworker status. Again, office workers and occasional teleworkers spend more time commuting than home-based teleworkers (18 and 15 minutes more on the average day, respectively). Home-based telework reduces grooming time by 16 minutes compared to office work, and occasional telework reduces it by 6 minutes. We find that female home-based teleworkers spend 10 minutes more per average day engaging in sports and active leisure activities than other workers, but this is the only difference that we find for leisure activities. Among mothers, time spent with children per average day is 52 minutes higher for home-based teleworkers than for office workers, and kids are present during work at home time for 15 more minutes. Home-based workers spend 40 minutes with clients, compared to 3 hours and 50 minutes for occasional teleworkers and 4 hours

than do office workers, and home-based teleworkers spend 11 minutes longer commuting to the office than do office workers, but the standard errors are large and the estimates are not statistically significant.

and 40 minutes for office workers. Time with friends and spouse on the average day is not affected by telework status for men and women.

In terms of potential preferences for weekly activities, we can describe home-based teleworkers as men and women who prefer to spend 2 hours less on commute and 1.5–2 hours less time getting dressed and ready for work than traditional on-site workers. Instead, these men prefer to spend an extra hour per week enjoying meals and women prefer an extra hour of sports. Fathers who choose to work most of the week from home spend an additional 2.2 hours directly engaging with children, while mothers supervise their children while multitasking for 6.1 extra hours per week. Men and women who choose telework over office work are comfortable spending over 20–24 hours more awake time alone. Occasional male teleworkers are not that different from male office workers, except that they possibly face a longer commute, prefer to spend an extra hour per week in meals, spend 3.5 hours less with coworkers and 1 hour and 15 minutes longer alone. Female occasional teleworkers are also not that different from office workers, except that they spend 5.7 fewer hours per week with coworkers and 2 hours and 13 minutes longer alone.

These time-use differences between teleworkers and office workers may be biased due to selection into telework and omitted workplace variables. In addition, the time-use differences between teleworkers on office days and work-at-home days may be biased because home-based workers will appear in the work-at-home day category with higher frequency. In order to verify that our results in Tables 3A, 3B, 4A, and 4B are robust, we estimate linear regressions using OLS (varying the omitted worker group and including a constant term) and calculate Oster betas. For all our statistically significant results, the Oster bounds exclude zero, suggesting that our results are robust (see Appendix Tables A.4 and A.5).

4.4. Timing of Activities: Teleworking 9 to 5?

Workers may also vary the timing of their activities between WFH days and office days. In Figure 3, we show the share of workers among teleworkers on WFH days, teleworkers on office days and office workers on office days who are participating in select activities (work, household production, travel, leisure, sleep, and for parents, time with own children) at each minute of the day on weekday workdays. In Panels A and B, we find that the majority of workers in all groups are working during traditional core working hours (8 a.m. to 5 p.m.). However, we see that male teleworkers are slightly less likely to be working in the afterschool hours (3 to 5 p.m.) on their WFH days than on their office days, although they are just as likely to be working on their WFH days as office workers. Male teleworkers on their WFH days are more likely to be doing household production activities and spending time with children during these after school hours. For example, consider the 4 o'clock diary hour. At this time, 75 percent of male teleworkers on office days are working, while only 60 percent of male teleworkers on home days are working (Panel A). Nineteen percent of male teleworkers on WFH days are doing household production activities (Panel C), while less than 3 percent of male teleworkers on office days are doing household production. Thirty-two percent of fathers who are teleworkers and WFH on their diary day are spending time with children (Panel E), while 7 percent of fathers who are teleworkers and work in the office on their diary day are spending time with children. As would be expected, we see a large dip in the share of all workers working at lunchtime. Male office workers are slightly more likely to be working in the evening hours than are male teleworkers. However, only one percent of male office workers are doing their evening work from home (not shown). Even though their average hours worked are not statistically significantly different across work locations, female teleworkers are much less likely to be working during core working hours on their WFH days than on their office days, suggesting that WFH allows them greater flexibility to conduct household or family responsibilities (Panel B). Looking at travel time (Panels G and H), we find that teleworkers on office days have much more concentrated travel times than do office workers, with large spikes in the share of teleworkers traveling around 8 a.m. and 5 p.m. This suggests that they organize their daily work-life schedules differently. For both men and women, we find that most of their leisure activities on weekday workdays occur after 4 p.m., with the exception of a small share of male teleworkers who participate in leisure activities between 6 and 7 a.m. (18 percent) (Panels I and J). We observe that female teleworkers are more likely to participate in leisure activities between 7 and 9 p.m. on WFH days than on office days, while male teleworkers are substantially more likely to participate in leisure activities between 10 p.m. and 12 a.m. on WFH days than on office days.

Looking at sleep, we find that a slightly greater share of teleworkers is sleeping later in the morning on their WFH days versus office days (Panels K and L). It appears that WFH allows workers' waking hours to shift to later in the day, i.e., they wake later and go to sleep later, which may be an indication that standard work schedules do not sync with their circadian rhythms or that night owls select telework. On average, male teleworkers on WFH days wake up at 6:38 a.m. but at 6:16 a.m. on office days, while female teleworkers on WFH days wake up at 6:32 a.m. but at 6:08 a.m. on office days (22 and 24 minutes earlier on office days, respectively). Thus, even though we do not find differences in the conditional mean sleep time by teleworking status, there may nonetheless be productivity effects resulting from increased quality of sleep on WFH days due to differences in the timing of sleep.

5. Discussion and conclusion

We use pre-COVID data to gain insights into the link between telework and wages and explore a potential mechanism—time allocation—through which these links may operate. Understanding how being able to work entire workdays from home affects wages, and how teleworkers allocate their time is important for post-pandemic policy design of family-friendly workplaces where telework will be ever more prevalent. Because the effects of teleworking vary by gender, our study is relevant to gender equality policy making, as well. We show that mean wages are higher for teleworkers than office workers; however, once we account for omitted variable bias, we find that only some workers earn a wage premium for teleworking. On the whole, full-time employed women who work most days of the week at home do not earn a wage premium, while results for female occasional teleworkers are mixed. Mothers who occasionally work from home do not earn a wage premium, nor do women working in professional and technical occupations. Thus, we do not find clear evidence that increasing the number of telework days for women will reduce the gender wage gap or motherhood wage gap, but it may improve mothers' well-being and possibly even allow some mothers to participate in the labor force who otherwise could not. On the other hand, increasing the frequency of telework may result in higher wages for men, because we find higher wage premiums for male home-based teleworkers in all sub-sample analyses. We also find that fathers earn wage premiums when they telework, while mothers do not (regardless of the intensity of telework), which is consistent with prior research indicating that women are more willing to pay for location flexibility. The strong positive effects of teleworking on wages for males are consistent with telework increasing productivity.

Using time diaries from the new ATUS-LV module, we look at teleworker and office worker time-use patterns to investigate whether they may help explain differences in worker productivity as a result of being able to work exclusively from home on some or all of their workdays. We find many statistically significant differences in time allocation between teleworkers who work from home on their diary day and teleworkers who work in the office on their diary day. We also find differences in time allocation between teleworkers and office workers. On the whole, these differences suggest that WFH allows workers to better balance work and family responsibilities and enjoy more leisure activities as they spend less time commuting and grooming. Workers may be more alert on their jobs when they can skip their morning commute and other preparations for going into the office, resulting in higher productivity on their WFH days. Our results suggesting no difference in total work time for full-time wage and salary workers on the average day among home-based teleworkers, occasional teleworkers and office workers lead us to conclude that workers are not shirking on the job or being overworked as the boundaries between work and home life blur. Instead, they are flexing their work schedules to balance their multiple responsibilities. However, mothers who are home-based teleworkers do not earn wage premiums. This could be because they are interrupted more often by their children (who are more likely to be in their presence) while working from home or because they work a shorter workday compared to women without children.

Teleworkers use some of their time windfall from the elimination of their long commutes to do more household production activities on their WFH days, especially women. We also find that female teleworkers increase their physical leisure activities on the average day. We find some evidence that telework may decrease the gender care gap, because males spend more time on primary child care on WFH days and on the average day if they telework most days in their workweek. We find that parents spend more total time with their children and at different times of the day when they work from home. These non-market work and care activities are more likely to occur during traditional core working hours.

Telework thus potentially has positive implications for child development—because children receive more maternal time overall if their mothers are home-based teleworkers, more parental time after school, when they may need it most, and more primary child care time from their fathers if their fathers are home-based teleworkers (Fiorini and Keane 2014; Hsin and Felfe 2014; Caetano, Kinsler, Teng 2019)—and positive implications for parents' well-being, because parents enjoy spending time with their children more than doing other activities (Connelly and Kimmel 2015; Musik, Meier, and Flood 2016). Our time-use findings are also consistent with mothers being willing to accept lower wages at a job that provides the option to work from home so that they can spend more time with their children. Teleworkers also spend more time watching TV and using the computer for leisure on their WFH days than office days, though not on the average day. This suggests that teleworkers adjust the timing of activities over the days of the week, which also could enhance their well-being. Finally, we find that workers wake-up later in the day on their telecommuting days, although they do not get more sleep overall, which could be a mechanism through which telework leads to higher worker productivity and wages. Overall, our results based on a nationally representative survey suggest that work location flexibility policies may at least in part account for higher productivity for some workers and improve work-life balance for others.

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Table 1. Sample means

	Men			Women		
	Home-based teleworkers	Occasional teleworkers	Office workers	Home-based teleworkers	Occasional teleworkers	Office workers
N	159	458	3,590	182	386	3,280
Hourly wage($)	47.996***	49.085***	27.063	**29.327*****	**38.917*****	23.431
	(25.269)	(28.679)	(18.821)	(15.782)	(21.465)	(16.440)
Some college	**0.189****	**0.097*****	0.255	0.168***	0.146***	0.281
College degree	0.407***	0.512***	0.220	0.345***	0.408***	0.274
Graduate degree	0.329***	0.326***	0.121	**0.306*****	**0.385*****	0.166
Lives with spouse/partner	0.787***	0.755***	0.626	0.658***	0.665***	0.572
Spouse/partner employed	0.566*	0.570***	0.453	0.597***	0.589***	0.490
Age	44.358**	41.798	39.989	42.159	42.187	41.071
	(11.165)	(10.961)	(12.313)	(11.012)	(10.807)	(12.651)
Black, non-Hispanic	0.122	0.090***	0.112	0.156	0.094***	0.149
Asian, Non-Hispanic	**0.033**	**0.106*****	0.056	0.035	0.079**	0.055
Hispanic	0.073***	0.061***	0.199	0.098***	0.064***	0.147
Own children age<=5	0.138	0.205***	0.171	0.134**	0.167*	0.140
Own children age 6–17	0.266***	0.231***	0.196	0.207	0.267*	0.207
Other adult 18–69	0.175*	0.192***	0.304	0.233**	0.191***	0.331
Elderly person age 70+	0.044	0.005***	0.032	0.035	0.016*	0.036
Has a disability	**0.00****	**0.240**	0.330	0.290	0.018	0.300
Foreign born	**0.094*****	**0.166**	0.204	0.083**	0.087***	0.145
Metropolitan residence	0.932**	0.971***	0.860	0.958***	0.957***	0.856
Midwest	0.232	0.260	0.244	0.200	0.171***	0.240
Northeast	0.235**	0.215***	0.161	0.177	0.197**	0.167
West	0.267	0.199	0.229	0.252	0.250***	0.197
Year 2018	0.429	0.541	0.496	0.550**	0.554	0.514
Weekend/holiday diary day	**0.238*****	**0.308**	0.302	0.285	0.320	0.296
Flexible work schedule	0.540***	0.505***	0.157	0.527***	0.458***	0.125
Paid hourly	0.162***	0.140***	0.593	**0.297*****	**0.171*****	0.615
Union member	0.048***	0.039***	0.133	0.067***	0.055***	0.129
Government job	0.108***	0.120*	0.153	**0.096*****	**0.214****	0.238
Occupation:						
Management, business and financial operations	**0.254*****	**0.351*****	0.145	0.303***	0.410***	0.171
Professional and technical	0.526***	0.467***	0.207	0.428	0.419**	0.341
Service and support	0.023***	0.037***	0.141	0.041***	0.010***	0.140
Sales and administrative support	0.181*	0.113	0.137	**0.223**	**0.152*****	0.267
Production	0.016***	0.032***	0.371	0.005***	0.009***	0.081
Industry:						
Natural resources and mining	0	0.022	0.011	0	0.004	0.004
Construction	0.017***	0.023***	0.107	0.009	0.012	0.010
Manufacturing	0.099**	0.152	0.182	0.092	0.094	0.079
Wholesale and retail trade	0.079	0.061***	0.138	0.047	0.067***	0.101
Transportation and utilities	0.017***	0.038***	0.089	0.015	0.026	0.029
Information	0.049***	0.040***	0.019	0.070**	0.022	0.014
Finance activities	0.203***	0.144***	0.057	0.165***	0.164***	0.082
Business and professional services	0.289***	0.312***	0.113	0.239***	0.178***	0.090
Education and health services	0.170	0.122	0.124	0.286***	0.284***	0.427
Leisure, hospitality, other services	0.056*	0.037***	0.098	0.036**	0.078	0.106
Public administration	**0.021****	**0.050**	0.062	0.041	0.073	0.059

Note: ATUS leave module weights used. Standard deviations are in parentheses for continuous variables. Sample: full-time wage and salary workers age 18–64. ***, **, * indicate differences are statistically significant with respect to office workers at the 1, 5, and 10% level, respectively. In **bold**: differences between home-based and occasional teleworkers are statistically significant at the 5% level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table 2A. Effects of teleworking on log hourly wages for men

MEN	No controls	Add personal controls	Add job controls	Oster beta
	1	2	3	4
Panel A. All workers				
Home-based teleworker	0.608***	0.282***	0.186***	0.065
	[0.058)	(0.055)	(0.060)	
Occasional teleworker	0.602***	0.261***	0.144***	-0.018
	(0.045)	(0.037)	(0.034)	
R^2	0.11	0.41	0.53	
N	4,207	4,207	4,207	
Panel B. Own children age <18				
Home-based teleworker	0.565***	0.282***	0.188***	0.086
	(0.072)	(0.068)	(0.066)	
Occasional teleworker	0.640***	0.285***	0.192***	0.030
	(0.049)	(0.044)	(0.043)	
R^2	0.13	0.43	0.52	
N	2,062	2,062	2,062	
Panel C. No own children age <18				
Home-based teleworker	0.628***	0.286***	0.184**	0.056
	(0.086)	(0.081)	(0.094)	
Occasional teleworker	0.550***	0.245***	0.097**	-0.036
	(0.068)	(0.055)	(0.049)	
R^2	0.09	0.38	0.54	
N	2,145	2,145	2,145	
Panel D. Occupations: Management, business and financial operations				
Home-based teleworker	0.250*	0.16	0.182*	0.185
	(0.131)	(0.099)	(0.107)	
Occasional teleworker	0.363***	0.198***	0.154***	0.083
	(0.059)	(0.048)	(0.050)	
R^2	0.07	0.39	0.45	
N	814	814	814	
Panel E. Occupations: Professional, technical				
Home-based teleworker	0.266***	0.208***	0.157**	0.130
	(0.075)	(0.069)	(0.081)	
Occasional teleworker	0.273***	0.171***	0.114**	0.045
	(0.068)	(0.056)	(0.047)	
R^2	0.04	0.29	0.41	
N	1,125	1,125	1,125	
Panel F. Occupation: Service, sales, admin support, production				
Home-based teleworker	0.788***	0.418***	0.298**	0.144
	(0.131)	(0.130)	(0.127)	
Occasional teleworker	0.494***	0.260**	0.174*	0.070
	(0.122)	(0.107)	(0.099)	
R^2	0.05	0.3	0.42	
N	2,268	2,268	2,268	

Notes: Columns 1–3 in this table reports OLS regression coefficients where we regress log hourly wages on teleworker status. ATUS leave module weights used. Standard errors are in parentheses. Controls in column 2: year, region, education, spouse or partner, spouse/partner employed, quartic polynomial in age, race/ethnicity (black, Asian, Hispanic), own children age 0–5, own children age 6–17, presence of other adult age 18–69, presence of elderly person age 70+, foreign born, metropolitan residence, disability indicator. Additional controls in column 3: paid hourly, union member, government job, industry, occupation. Column 4 shows Oster betas assuming $\delta = 1$ and $R_{max} = 1.3*\tilde{R}$.
***indicates statistical significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table 2B. Effects of teleworking on log hourly wages for women

WOMEN	No controls	Add personal controls	Add job controls	Oster beta
	1	2	3	4
Panel A. All workers				
Home-based teleworker	0.255***	0.095*	-0.015	-0.089
	(0.057)	(0.055)	(0.048)	
Occasional teleworker	0.530***	0.266***	0.173***	0.040
	(0.040)	(0.039)	(0.037)	
R^2	0.07	0.35	0.51	
N	3,848	3,848	3,848	
Panel B. Own children age <18				
Home-based teleworker	0.336***	0.073	-0.033	-0.133
	(0.075)	(0.064)	(0.059)	
Occasional teleworker	0.519***	0.224***	0.113**	-0.032
	(0.049)	(0.046)	(0.045)	
R^2	0.08	0.41	0.56	
N	1,793	1,793	1,793	
Panel C. No own children age <18				
Home-based teleworker	0.213***	0.104	-0.011	-0.067
	(0.075)	(0.074)	(0.066)	
Occasional teleworker	0.529***	0.282***	0.211***	0.094
	(0.059)	(0.057)	(0.053)	
R^2	0.07	0.34	0.5	
N	2,055	2,055	2,055	
Panel D. Occupations: Management & financial operations				
Home-based teleworker	0.187**	0.053	0.001	-0.029
	(0.083)	(0.078)	(0.075)	
Occasional teleworker	0.449***	0.238***	0.219***	0.137
	(0.065)	(0.060)	(0.056)	
R^2	0.09	0.35	0.47	
N	806	806	806	
Panel E. Occupations: Professional, technical				
Home-based teleworker	0.021	-0.062	-0.129	-0.168
	(0.096)	(0.091)	(0.079)	
Occasional teleworker	0.235***	0.100*	0.082	0.031
	(0.064)	(0.061)	(0.064)	
R^2	0.02	0.31	0.46	
N	1,386	1,386	1,386	
Panel F. Occupation: Service, sales, admin support, production				
Home-based teleworker	0.318***	0.207**	0.107	0.049
	(0.105)	(0.091)	(0.081)	
Occasional teleworker	0.560***	0.373***	0.241***	0.133
	(0.072)	(0.069)	(0.068)	
R^2	0.06	0.24	0.39	
N	1,656	1,656	1,656	

Notes: ATUS leave module weights used. Standard errors are in parentheses. See the notes for Table 2A for control variables. Columns 4 shows Oster betas assuming $\delta = 1$ and $R_{max} = 1.3*\tilde{R}$.
***indicates statistical significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table 3A. Conditional mean time use for men, Monday-Friday workdays (minutes/day)

MEN Time Use Activities	Teleworkers on home days	Teleworkers on office days	Office workers on office days	Differences between groups
	1	2	3	4
N	83	182	1,401	
Work & work-related activities	507	520	543	3>1** 3>2*
Working at main job	490	516	537	3>1*** 3>2*
Work from workplace	-4	485	527	all ***
Work from home	481	23	6	all ***
Work from other place	13	8	4	
Travel time	35	97	82	3>1*** 2>1*** 2>3**
Commute	5	63	57	3>1*** 2>1***
Non-work-related	31	30	26	
Personal care	568	578	558	2>3*
Sleep	462	460	459	
Grooming	23	37	41	3>1*** 2>1***
Meals	79	66	57	1>3*** 1>2* 2>3*
Household production	56	44	46	
Food preparation	26	14	16	1>3** 1>2**
Housework	15	18	16	
Buying goods and services	8	8	8	
Household management	8	4	5	
Care	40	21	23	1>3** 1>2**
Primary child care (fathers)	68	37	38	1>3*** 1>2***
Leisure	235	181	188	1>3*** 1>2***
Social activities	48	31	31	1>3*
Sports and active leisure	10	13	12	
Relaxing	25	24	20	
TV and computer for leisure	150	107	117	1>3** 1>2***
With own children <18 (fathers)	245	132	140	1>3*** 1>2***
With spouse/partner (couples)	214	174	161	1>3*** 1>2*
With friends	2	16	17	3>1*** 2>1**
With coworkers/clients	0	415	429	3>1*** 2>1***
Alone	685	329	329	1>3*** 1>2***
Child present during work (fathers)	23	2	2	1>3** 1>2**

Notes: ATUS leave module weights used. Workdays are days on which the respondent reports at least 4 hours of work. The table contains conditional mean values computed from OLS regressions with the following set of controls: year, region, month, spouse or partner present, spouse/partner employed, quartic polynomial in age, education, race/ethnicity (black, Hispanic, Asian), own child age 0–5, own child age 6–17, presence of another adult age 18–69, presence of an elderly person age 70+, disability indicator, foreign born, metropolitan residence, paid hourly, flexible hours schedule, union member, multiple job holder, log hourly wage, government job, industry, occupation. Column 4 shows whether the group differences are statistically significant.
***indicates statistical significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table 3B. Conditional mean time use for women, Monday-Friday workdays (minutes/day)

WOMEN Time Use Activities	Teleworkers on home days	Teleworkers on office days	Office workers on office days	Differences between groups
	1	2	3	4
N	86	147	1,249	
Work & work-related activities	509	533	521	
Working at main job	507	529	515	
Work from workplace	0	493	507	3>1*** 2>1***
Work from home	501	34	6	all***
Work from other place	5	3	3	
Travel time	33	86	78	3>1*** 2>1***
Commute	1	57	52	3>1*** 2>1***
Non-work-related	31	29	26	
Personal care	568	569	582	
Sleep	477	460	463	
Grooming	36	57	58	3>1*** 2>1***
Meals	54	52	57	
Household production	103	62	63	1>3*** 1>2***
Food preparation	38	28	28	
Housework	37	17	17	1>3** 1>2**
Buying goods and services	15	10	12	
Household management	12	5	7	1>2*
Care	29	35	31	
Primary child care (mothers)	51	59	62	
Leisure	200	156	165	1>3*** 1>2***
Social activities	30	28	31	
Sports and active leisure	14	11	9	
Relaxing	26	15	19	
TV and computer for leisure	124	92	94	1>3*** 1>2**
With own children <18 (mothers)	270	175	172	1>3*** 1>2**
With spouse/partner (couples)	146	143	148	
With friends	21	19	17	
With coworkers/clients	12	445	443	3>1*** 2>1***
Alone	632	280	282	1>3*** 1>2***
Child present during work (mothers)	46	13	5	1>3**

Notes: ATUS leave module weights used. Workdays are days on which the respondent reports at least 4 hours of work. See the notes for Table 3A for control variables. Column 4 shows whether the group differences are statistically significant.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table 4A. Time use conditional means for men, Monday-Sunday typical day of the week (minutes/day)

MEN Time Use Activities	Home-based teleworkers	Occasional teleworkers	Office workers	Differences between groups
	1	2	3	4
N	159	458	3,590	
Work & work-related activities	356	351	364	
Working at main job	348	346	357	
Work from workplace	106	275	331	all***
Work from home	205	56	11	all***
Work from other place	32	15	15	
Travel time	69	91	82	2>1*
Commute	18	36	36	3>1*** 2>1***
Non-work-related	46	51	45	
Personal care	608	615	605	
Sleep	510	497	501	
Grooming	25	36	37	3>1*** 2>1***
Meals	73	73	64	1>3* 2>3**
Household production	84	88	87	
Food preparation	21	21	21	
Housework	39	41	39	
Buying goods and services	18	20	18	
Household management	10	7	8	
Care	41	36	32	
Primary child care (fathers)	68	55	50	1>3*
Leisure	283	255	271	
Social activities	57	55	57	
Sports and active leisure	19	19	18	
Relaxing	39	28	27	
TV and computer for leisure	152	147	159	
With own children <18 (fathers)	281	269	250	
With spouse/partner (couples)	290	274	264	
With friends	29	35	39	
With coworkers/clients	78	250	280	3>1*** 2>1*** 3>2*
Alone	495	329	318	1>3*** 1>2***
Child present during work (fathers)	11	8	3	

Notes: ATUS leave module weights used. Columns 1–3 contains conditional mean values computed from OLS regressions with the following set of controls: year, region, month, Saturday, Sunday, spouse or partner present, spouse/partner employed, quartic polynomial in age, education, race/ethnicity (black, Hispanic, Asian), own child age 0–5, own child age 6–17, presence of another adult age 18–69, presence of an elderly person age 70+, disability indicator, foreign born, metropolitan residence, paid hourly, flexible hours schedule, union member, multiple job holder, log hourly wage, government job, industry, occupation. Column 4 shows whether the group differences are statistically significant.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table 4B. Time use conditional means for women, Monday-Sunday typical day of the week (minutes/day)

WOMEN Time Use Activities	Home-based teleworkers	Occasional teleworkers	Office workers	Differences between groups
	1	2	3	4
N	182	386	3,280	
Work & work-related activities	351	334	340	
Working at main job	348	330	331	
Work from workplace	44	241	304	all***
Work from home	273	72	11	all***
Work from other place	35	16	16	
Travel time	67	78	79	
Commute	14	29	32	3>1** 2>1*
Non-work-related	54	50	45	
Personal care	608	620	627	3>1*
Sleep	505	509	506	
Grooming	36	47	53	3>1*** 2>1*** 3>2**
Meals	59	59	62	
Household production	119	118	115	
Food preparation	33	41	36	
Housework	46	42	46	
Buying goods and services	23	25	24	
Household management	15	9	10	1>2*
Care	40	47	44	
Primary child care (mothers)	66	81	79	
Leisure	257	243	236	
Social activities	69	61	60	
Sports and active leisure	21	11	11	1>3** 1>2**
Relaxing	32	23	25	
TV and computer for leisure	121	137	126	
With own children <18 (mothers)	335	293	283	1>3**
With spouse/partner (couples)	249	251	239	
With friends	43	33	31	
With coworkers/clients	40	231	280	all***
Alone	504	309	290	1>3*** 1>2***
Child present during work (mothers)	20	18	5	1>3** 2>3**

Notes: ATUS leave module weights used. See the notes for Table 4A for control variables. Column 4 shows whether the group differences are statistically significant.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

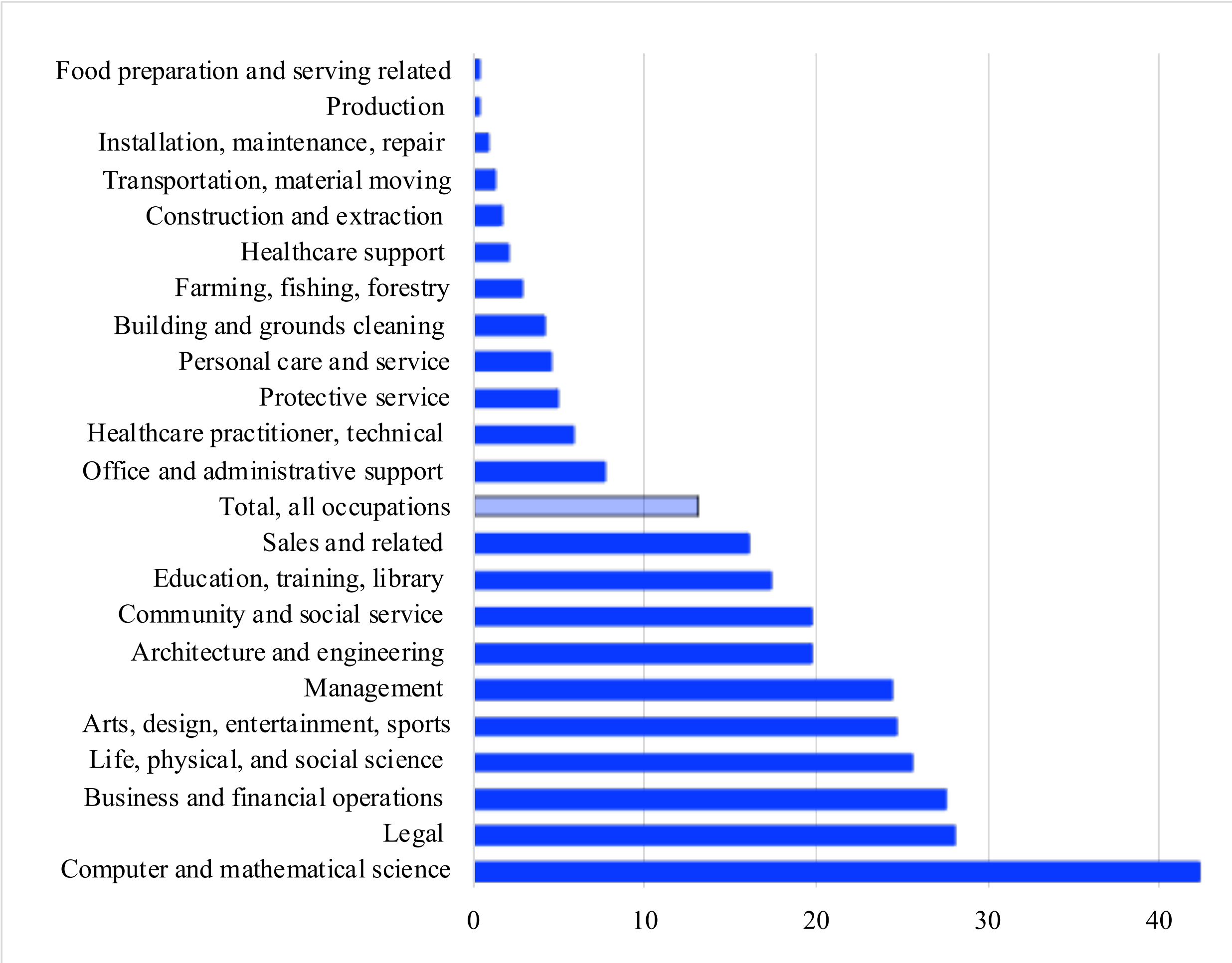

Fig. 1 Percent of teleworkers among full-time wage and salary workers by detailed occupation group, 2017–2018

Source: Author's calculations using ATUS-LV module (2017–2018)

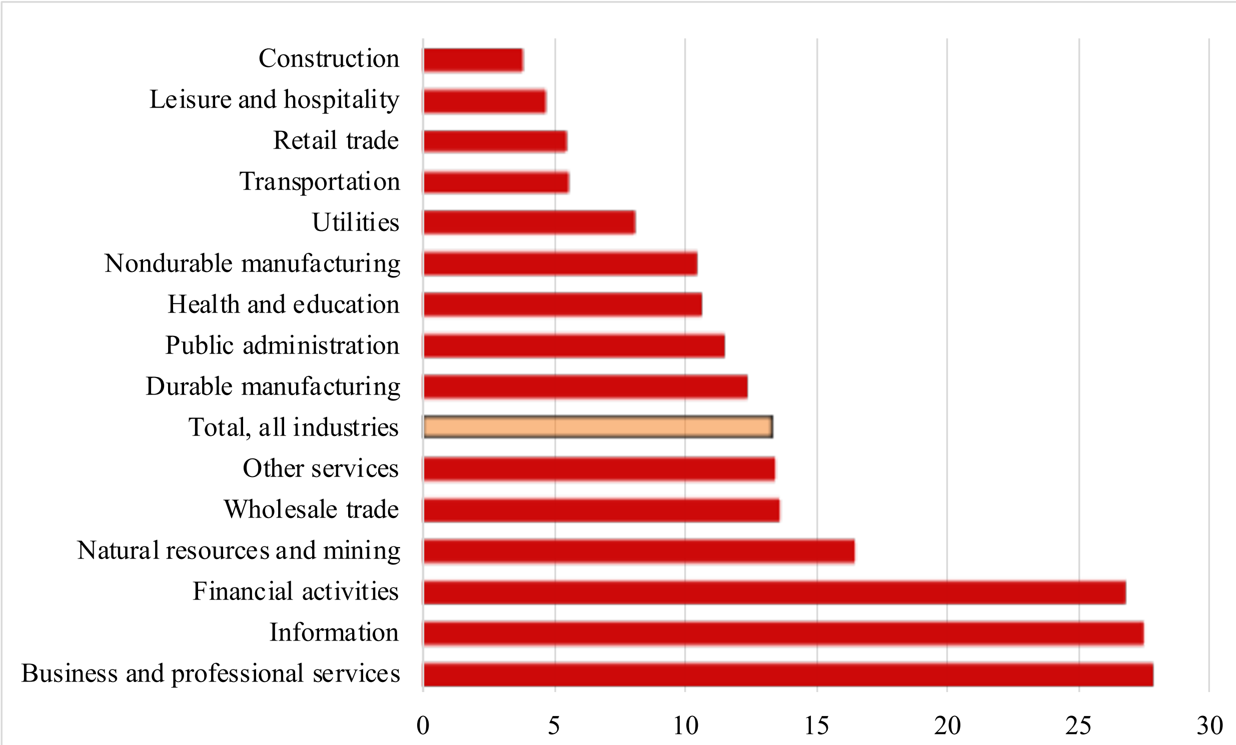

Fig. 2 Percent of teleworkers among full-time wage and salary workers by major industry group, 2017–2018

Source: Author's calculations using ATUS-LV module (2017–2018)

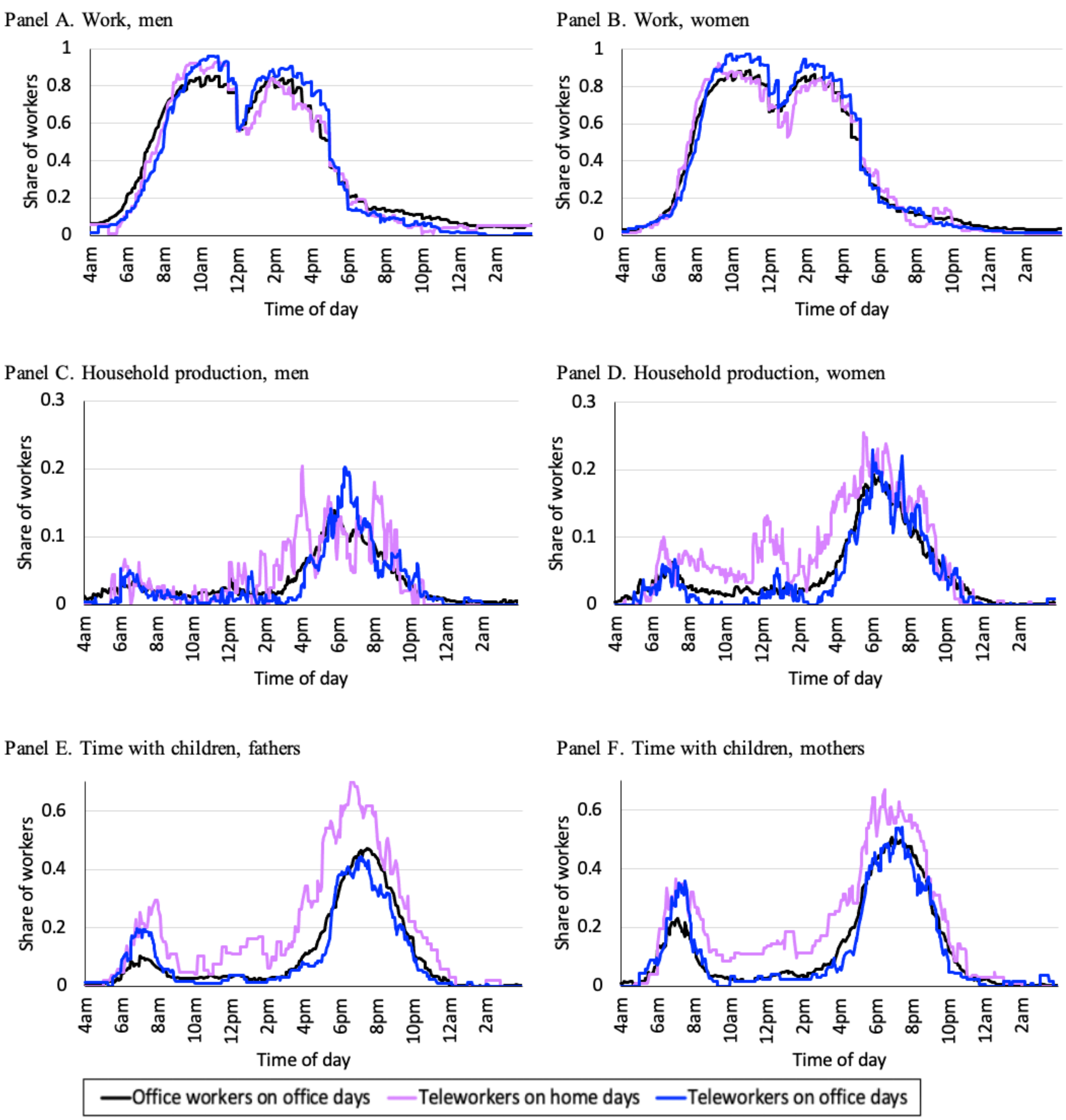

Fig. 3 Time use by type of worker and work location. Monday-Friday workdays

Note: Workdays are days on which the respondent reports at least four hours of work. Sample sizes for work, household production, travel, leisure, sleep and graphs are: men (N = 1,401, 83, 182), women (N = 1,249, 86, 147) for the three groups of workers respectively. Sample sizes for time with own children graphs are: Fathers (N = 681, 49, 100), Mothers (N = 551, 37, 82). Time with own children includes time spent working.
Source: Author's calculations using ATUS-LV module (2017–2018)

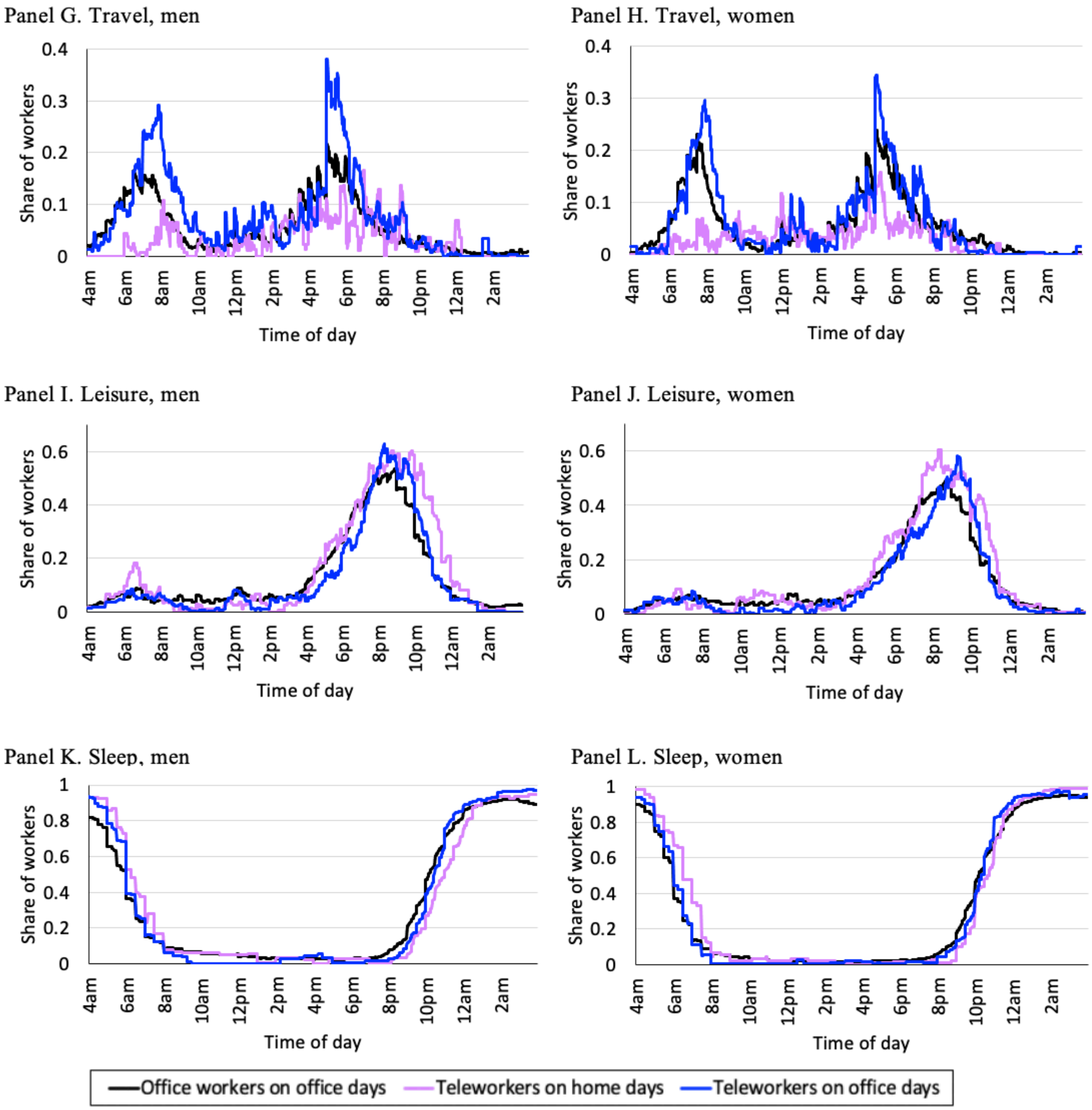

Fig. 3 Time use by type of worker and work location. Monday-Friday workdays (Continued)

Note: Workdays are days on which the respondent reports at least four hours of work. Sample sizes for work, household production, travel, leisure, sleep and graphs are: men (N = 1,401, 83, 182), women (N = 1,249, 86, 147) for the three groups of workers respectively. Sample sizes for time with own children graphs are: Fathers (N = 681, 49, 100), Mothers (N = 551, 37, 82). Time with children includes time spent working.
Source: Author's calculations using ATUS-LV module (2017–2018)

APPENDIX

Table A.1. Variables from the American Time Use Survey

Time-Use Category	**ATUS Activity Tier Codes and Variables**
Work and work-related activities	T1 = 5
Working at main job	T1 = 5 & T2 = 1 & (T3 = 1 | T3 = 99)
Work from workplace	T1 = 5 & T2 = 1 & T3 ≠ 2 & TEWHERE = 2
Work from home	T1 = 5 & T2 = 1 & T3 ≠ 2 & TEWHERE = 1
Work from other place	T1 = 5 & T2 = 1 & T3 ≠ 2 & TEWHERE ≠ 1 or 2
Travel time	T1 = 18
Commuting	T1 = 18 & T2 = 5. Adjusted using trip tour methodology.
Non-commuting	T1 = 18 (excluding T2 = 5). Adjusted using trip tour methodology.
Personal care	T1 = 1, T1 = 8 & (T2 = 4 | T2 = 5), T1 = 11
Grooming	T1 = 1 & T2 = 2
Sleep	T1 = 1 & T2 = 1
Other personal care	T1 =1 & T2 = 3, 4, 5, or 99, T1==8 & T2=4, 5
Meals	T1 = 11
Household production	T1 = 2 & T2 ≠ 6, T1 = 7, T1 = 8 (T2 ≠ 4, 5, 7), T1 = 9 & T2 ≠ 3, T1 = 10
Buying goods and services	T1 = 7, T1 = 8 & T2 ≠ 4, 5, 7, T1 = 9 & T2 ≠ 3, T1 = 10
Housework (cleaning, laundry)	T1 = 2 & T2 = 1
Food preparation and clean-up	T1 = 2 & T2 = 2
Home and vehicle maintenance	T1 = 2 & (T2>2 & T2<=99 & T2 ≠ 6, 9)
Household Management	T1 = 2 & T2 = 9

Note: T1 refers to first tier activity code. T2 refers to second tier activity code. T3 refers to third tier activity code. TEWHERE refers to the location of the activity. TUWHO refers to who was in the room or accompanied you on an activity. Trip tour methodology on average increases work-related travel by 3 min for men and by 8 min for women compared to reported commute time (Kimbrough, 2019). In turn, non-work related travel is reduced by the same amount. This methodology classifies as commute trip chains that contain no stop of more than 30 minutes and either begin at home and end at work or begin at work and end at home. The travel time (but not the stop time) on such tours is summed to calculate each worker's commute, or work-related time.

Table A.1. Variables from the American Time Use Survey (Continued)

Time-Use Category	**ATUS Activity Tier Codes and Variables**
Care	
Primary child care for household and nonhousehold children	T1 = 3 & T2<=3, T1 = 4 & T2<=3
Adult care	T1 = 3 & (T2 = 4, 5), T1 = 4 & (T2 = 4, 5)
Pet care & veterinary services	T1 = 2 & T2 = 6, T1 = 8 & T2 = 7, T1 = 9 & T2 = 3
Leisure	T1 = 6, T1 = 12, T1 = 14, T1 = 13 & T2>=2, T1 = 15, T1 = 16 & (T2 = 1 & T3<=2), T1 = 50
Social and organizational activities	T1 = 6, T1 = 12 & T2 ≠ 3, T1 = 14, T1 = 13 & T2>=2, T1 = 15
Sports and active leisure	T1 = 13 & T2 = 1
Relaxing (listening to music, reading,	T1 = 12 & T2 = 3 & T3 ≠ 3, 4, 7, 8
Watching TV and, using computer for	T1 = 12 & T2 = 3 & T3 = 3
Time with family and friends	
Time with own children under age 18	All activities where TUWHO = 22 or TUWHO = 40
Time with spouse/partner (excluding work time)	TRTSPOUSE, TRTUNMPART
Time with coworkers/clients	TRTCCC_WK
Time with friends	TRTFRIEND
Time Alone (including at work)	TRTALONE_WK

Note: T1 refers to first tier activity code. T2 refers to second tier activity code. T3 refers to third tier activity code. TEWHERE refers to the location of the activity. TUWHO refers to who was in the room or accompanied you on an activity. Trip tour methodology on average increases work-related travel by 3 min for men and by 8 min for women compared to reported commute time (Kimbrough, 2019). In turn, non-work related travel is reduced by the same amount. This methodology classifies as commute trip chains that contain no stop of more than 30 minutes and either begin at home and end at work or begin at work and end at home. The travel time (but not the stop time) on such tours is summed to calculate each worker's commute, or work-related time.

Table A.2. Effects of teleworking on log hourly wages, pooled men and women

	No controls	Add personal controls	Add job controls
	1	2	3
Home-based teleworker	0.426***	0.293***	0.195***
	(0.046)	(0.054)	(0.058)
Occasional teleworker	0.572***	0.267***	0.148***
	(0.031)	(0.037)	(0.034)
Home-based teleworker x Female		-0.206***	-0.217***
		(0.077)	(0.074)
Occasional teleworker x Female		-0.01	0.014
		(0.052)	(0.048)
Female		-0.190***	-0.136***
		(0.016)	(0.017)
R^2	0.09	0.39	0.52
N	8,055	8,055	8,055

Notes: ATUS leave module weights used. Standard errors are in parentheses. See the notes for Table 2A for control variables.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.

Source: Author's calculations using ATUS-LV module (2017–2018)

Table A.3.A. Conditional mean time use for men, Monday-Sunday typical workday (minutes/day)

MEN Time Use Activities	Teleworkers on home days	Teleworkers on office days	Office workers on office days	Differences between groups
	1	2	3	4
N	97	192	1,719	
Work & work-related activities	495	519	543	3>1*** 3>2**
Working at main job	477	515	537	3>1*** 2>1** 3>2*
Work from workplace	-7	482	527	all ***
Work from home	471	23	6	all ***
Work from other place	13	8	4	
Travel time	37	98	81	3>1*** 2>1*** 2>3**
Commute	5	64	56	3>1*** 2>1***
Non-work-related	33	31	25	
Personal care	575	579	560	
Sleep	467	465	460	
Grooming	23	37	41	3>1*** 2>1***
Meals	82	65	57	1>3*** 1>2** 2>3*
Household production	59	43	46	1>3* 1>2**
Food preparation	25	14	16	1>3** 1>2**
Housework	15	17	16	
Buying goods and services	11	8	8	
Household management	9	4	5	
Care	38	21	23	1>3** 1>2**
Primary child care (parents)	66	36	38	1>3*** 1>2***
Leisure	243	183	189	1>3*** 1>2***
Social activities	53	31	31	1>3** 1>2*
Sports and active leisure	9	13	11	
Relaxing	27	23	20	
TV and computer for leisure	147	109	118	1>3** 1>2**
With own children <18 (parents)	256	133	141	1>3*** 1>2***
With spouse/partner (couples)	221	175	163	1>3*** 1>2**
With friends	7	18	18	3>1* 2>1*
With coworkers/clients	0	417	431	3>1*** 2>1***
Alone	668	322	324	1>3*** 1>2***
Child present during work (parents)	22	3	3	1>3** 1>2*

Notes: ATUS leave module weights used. Workdays are days on which the respondent reports at least 4 hours of work. See the notes for Table 3A for control variables. Column 4 shows whether the group differences are statistically significant.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table A.3.B. Conditional mean time use for women, Monday-Sunday typical workday (minutes/day)

WOMEN Time Use Activities	Teleworkers on home days	Teleworkers on office days	Office workers on office days	Differences between groups
	1	2	3	4
N	102	153	1,483	
Work & work-related activities	507	531	520	
Working at main job	505	526	514	
Work from workplace	0	489	506	3>1*** 2>1*** 3>2*
Work from home	492	33	5	all ***
Work from other place	14	4	3	
Travel time	33	86	78	3>1*** 2>1*** 2>3*
Commute	1	56	51	3>1*** 2>1***
Non-work-related	33	32	27	
Personal care	565	569	582	
Sleep	474	460	464	
Grooming	34	55	57	3>1*** 2>1***
Meals	54	52	57	
Household production	104	64	64	1>3*** 1>2***
Food preparation	40	30	27	1>3* 1>2*
Housework	36	18	18	1>3** 1>2**
Buying goods and services	14	11	12	
Household management	14	5	7	1>3* 1>2**
Care	31	35	30	
Primary child care (parents)	52	57	60	
Leisure	200	158	167	1>3*** 1>2***
Social activities	30	30	32	
Sports and active leisure	14	10	9	
Relaxing	26	16	20	
TV and computer for leisure	123	92	95	1>3** 1>2**
With own children <18 (parents)	288	175	170	1>3*** 1>2***
With spouse/partner (couples)	158	148	149	
With friends	20	19	17	
With coworkers/clients	13	436	441	3>1*** 2>1***
Alone	617	288	282	1>3*** 1>2***
Child present during work (parents)	61	14	5	1>3*** 1>2**

Notes: ATUS leave module weights used. Workdays are days on which the respondent reports at least 4 hours of work. See the notes for Table 3A for control variables. Column 4 shows whether the group differences are statistically significant.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)

Table A.4. Coefficients on ‘Work at home day for teleworker’, Monday-Friday workdays

Time Use Activities	MEN, N=1,666				WOMEN, N=1,482			
	Relative to office worker on office day		Relative to teleworkers on office days		Relative to office worker on office day		Relative to teleworkers on office days	
	Coefficient (S.E)	Oster beta	Coefficient (S.E)	Oster beta	Coefficient (S.E)	Oster beta	Coefficient (S.E)	Oster beta
	1	2	3	4	5	6	7	8
Work & work-related activities	-42.5*** (14.7)	-52.8	-15.6 (16.6)	-10.4	-13.4 (16.5)	-15.1	-23.9 (19.3)	-33.2
Working at main job	-50.2*** (13.3)	-54.6	-25.9 (15.9)	-22.5	-8.5 (16.3)	-9.9	-23.5 (19.2)	-32.5
Travel time	-47.1*** (6.1)	-48.8	-61.1*** (8.5)	-71.7	-46.8*** (5)	-48.7	-52.6*** (6.2)	-61.2
Commute	-51.4*** (3.2)	-50.3	-58.5*** (5.3)	-63.6	-50.0*** (3.2)	-52.1	-54.8*** (4.6)	-62.9
Non-work-related	5.8 (5.5)	2.2	1.2 (7.1)	-4.1	4.8 (4.6)	4.4	1.8 (5.5)	-0.1
Personal care	12.4 (13.7)	18.1	-10.6 (15.6)	-14.9	-13.6 (10.5)	-15.3	-1.4 (13.6)	1.0
Sleep	7.1 (13.1)	12.2	1.4 (14.7)	5.0	13.7 (10.6)	12.8	17.1 (13.4)	17.2
Grooming	-17.4*** (3.0)	-17.7	-13.9*** (3.4)	-12.1	-21.6*** (4.8)	-22.1	-21.5*** (5.2)	-19.9
Meals	22.3*** (5.9)	22.1	13.4* (7.1)	7.5	-3.8 (4.7)	-5.0	1.8 (5.3)	3.4
Household production	10.4 (8.2)	11.0	12.6 (8.7)	13.0	40.5*** (14.6)	42.6	41.5*** (13.9)	45.9
Food preparation	9.4** (4.2)	9.9	11.4** (4.5)	12.6	12.4* (6.5)	14.0	9.9 (6.4)	10.6
Housework	-1.8 (4.2)	-1.4	-2.9 (4.7)	-3.1	19.3** (8.5)	21.1	19.4** (7.9)	21.6
Buying goods and services	0.3 (2.4)	0.1	0.7 (2.5)	1.1	3.6 (4.1)	2.9	5.6 (4.1)	6.1
Household management	2.5 (3.8)	2.1	3.4 (3.8)	3.4	4.7 (3.5)	4.3	6.6* (3.8)	7.1
Care	16.7** (6.5)	14.1	18.0*** (6.7)	16.5	-1.7 (5.3)	-1.4	-6.4 (6.5)	-8.3
Primary child care (parents)	29.5*** (10.3)	26.4	30.9*** (11)	27.4	-10.7 (12.3)	-3.3	-8.1 (12.8)	-7.1
Leisure	51.6*** (13.8)	58.1	54.0*** (15.8)	70.6	35.2*** (12.7)	37.0	44.2*** (14.5)	52.2
Social activities	17.7* (10.2)	17.4	17.6 (12.3)	17.4	-1.0 (8.0)	-1.5	1.6 (8.8)	2.8
Sports and active leisure	-1.4 (4.2)	-3.4	-3.2 (5)	-5.9	5.3 (5)	4.9	3.8 (5.8)	3.0
Relaxing	4.8 (6.4)	6.0	1.1 (6.5)	1.1	6.5 (7.8)	5.1	10.9 (8.0)	11.6
TV and computer for leisure	29.8*** (12.2)	39.6	36.0*** (13.2)	49.7	29.1*** (11.2)	31.8	31.8** (12.5)	38.2
With own children <18 (parents)	105.7*** (17.8)	116.3	113.0*** (20.3)	115.3	98.5*** (36.3)	101.0	95.1** (37.9)	97.8
With spouse/partner (couples)	53.0*** (18.7)	53.8	40.8* (20.7)	29.1	-1.7 (17.1)	-4.9	3.3 (21.8)	0.5
With friends	-15.3*** (5.3)	-14.5	-14.0** (6.1)	-15.4	4.1 (9.7)	4.3	1.8 (10.3)	0.5
With coworkers/clients	-430.7*** (15.3)	-446.0	-416.6*** (20.8)	-391.0	-430.5*** (12.8)	-419.1	-431.3*** (22.6)	-319.5
Alone	351.2*** (24.9)	346.1	356.2*** (29)	359.8	355.8*** (40)	342.2	355.6*** (43.2)	329.6
Child present at work (parents)	20.1** (9.7)	19.4	20.5** (10.5)	18.0	41.5* (21.9)	42.5	33.7 (22.0)	29.4

Notes: ATUS leave module weights used. See Table 3A notes for control variables. Oster betas assuming $\delta = 1$ and $R_{max} = 1.3*\tilde{R}$.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author’s calculations using ATUS-LV module (2017–2018)

Table A.5. Coefficients on 'Home-based teleworker', all days

Time Use Activities	MEN, N=4,207				WOMEN, N=3,848			
	Relative to office worker		Relative to occasional teleworkers		Relative to office worker		Relative to occasional teleworkers	
	Coefficient (S.E)	Oster beta	Coefficient (S.E)	Oster beta	Coefficient (S.E)	Oster beta	Coefficient (S.E)	Oster beta
	1	2	3	4	5	6	7	8
Work & work-related activities	-14.7 (20.6)	-25.5	2.1 (21.9)	-3.9	13.1 (19.9)	9.2	17.3 (21.5)	13.5
Working at main job	-13.5 (20.4)	-23.1	1.9 (21.8)	-2.6	18.5 (19.8)	14.4	18.8 (21.5)	13.0
Travel time	-13.6 (10.5)	-17.2	-22.3* (11.5)	-27.4	-11.1 (9)	-12.1	-11 (9.4)	-12.5
Commute	-17.7*** (5.7)	-18.8	-18.0*** (5.9)	-19.9	-18.2** (8)	-19.5	-15.2* (8.1)	-15.0
Non-work-related	1.1 (9.2)	-1.1	-5 (10.3)	-10.6	8.9* (5.2)	9.3	4.1 (5.8)	2.0
Personal care	6.8 (13.3)	12.4	-6 (14.2)	-3.4	-18.5 (13.4)	-17.5	-11.5 (13.9)	-7.0
Sleep	12.4 (11.3)	20.5	14.2 (12.5)	25.5	-0.9 (10.9)	1.4	-4.2 (11.5)	-2.7
Grooming	-12.1*** (2.6)	-12.3	-10.6*** (2.7)	-10.1	-16.0*** (3.5)	-16.3	-10.0*** (3.9)	-6.9
Meals	9.2* (4.9)	8.4	-0.3 (5.8)	-5.1	-2.7 (4.2)	-2.9	-0.4 (4.7)	-0.4
Household production	1.2 (8.8)	3.4	-2.2 (10.6)	0.2	3.7 (11.8)	5.8	0.4 (12.4)	2.0
Food preparation	-0.1 (2.9)	-0.2	0.2 (3.2)	0.2	-1 (4.5)	0.7	-6.7 (4.8)	-6.9
Housework	-0.2 (7.1)	1.3	-2 (8.7)	-0.9	0.5 (7.9)	1.5	3.1 (8.1)	5.7
Buying goods and services	-0.5 (2.7)	1.9	-2.7 (3.4)	-1.1	-0.9 (3.8)	-1.3	-2 (4.4)	-3.2
Household management	2 (3.8)	1.3	2.3 (3.7)	1.6	5.1 (3.4)	4.9	6.0* (3.6)	6.0
Care	9.2*(5.3)	9.1	4.4 (6.4)	3.0	-4.7 (5.2)	-4.9	-7.3 (6.0)	-8.7
Primary child care (parents)	18.4** (9.1)	19.0	13.3 (10.5)	12.1	-13.2 (10.1)	-16.9	-14.3 (11.1)	-20.2
Leisure	11.7 (15.2)	15.6	24.7 (15.9)	39.3	19.2 (14.3)	21.7	12.1 (15.5)	11.9
Social activities	0 (9.5)	-0.3	2.3 (10.9)	2.6	9.4 (10.4)	10.7	9.4 (11.3)	11.3
Sports and active leisure	1.7 (4.9)	0.6	0.7 (5.2)	-1.0	8.6* (4.6)	7.9	10.0** (4.9)	9.8
Relaxing	12 (9.5)	12.4	10.7 (9.7)	10.7	5.8 (6.4)	5.3	7.5 (6.9)	7.4
TV and computer for leisure	-2.8 (12.5)	4.4	8.7 (13.0)	23.8	-3.2 (13.0)	-0.6	-14.8 (14.1)	-16.6
With own children <18 (parents)	30.8 (21.5)	49.4	12.7 (24.4)	27.2	55.1** (26.8)	53.8	42.0 (29.3)	32.1
With spouse/partner (couples)	26.8 (18.1)	35.4	16.1 (19.2)	23.2	9.7 (21.1)	8.2	0.4 (21.8)	-2.5
With friends	-7.2 (8.6)	-4.8	-4.6 (9.3)	-0.4	14.1 (10.9)	14.9	10.9 (11.8)	10.5
With coworkers/clients	-204.6*** (23.1)	-207.9	-176.6*** (25.4)	-168.7	-239.4*** (20)	-240.8	-192.7*** (23.9)	-168.8
Alone	174.9*** (26.1)	170.3	165.3*** (28.8)	154.8	212*** (27.9)	204.9	192.0*** (31.1)	174.4
Child present at work (parents)	7.2 (4.8)	7.0	3.3 (5.5)	-0.1	15.6** (6.7)	16.9	1.5 (8.5)	-5.0

Notes: ATUS leave module weights used. See Table 4A notes for control variables. Oster betas assuming $\delta = 1$ and $R_{max} = 1.3*\tilde{R}$.
***indicates significance at the 0.01 level, **at the 0.05 level, and *at the 0.10 level.
Source: Author's calculations using ATUS-LV module (2017–2018)