Does the Ability to Work Remotely Alter Labor Force Attachment? An Analysis of Female Labor Force Participation[1]

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Abstract
This paper analyzes whether access to jobs that can be performed remotely affects labor market outcomes of women, especially along the participation margin. First, recent trends in remote utilization suggest that the gap in remote utilization between men and women has been closing down in recent months, with larger progress for prime-age women with young children. Second, I directly analyze the relationship between labor market flows and access to remote jobs over two main demographic dimensions: for prime-age women and for prime age-women with young children. My results point to the importance of remote work in reducing the probability of leaving the labor force for those groups, an effect that has building up since before the pandemic. Furthermore, I find evidence that the effect on the exit margin is salient around childbirth. Finally, I directly quantify the importance of access to remote jobs for labor force participation. I find that, since 2011, remote work had added around 5 percentage points to the prime-age female labor force participation, although, more recently, progress on participation has been coming from individuals in non-remote jobs. Prime-age women and prime-age women with children are among the demographics groups that are benefit the most from the work-from-home revolution.

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JEL Classification: J21, J13

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At the onset of the COVID-19 pandemic, a large share of the employed switched to remote work. According to the Bureau of Labor Statistics (BLS)'s Current Population Survey (CPS), almost 40 percent of workers were working remotely in May 2020 because of the pandemic (figure 1, purple line), adding to the evidence from other individual- and firm-level surveys.[3] Remote work because of the pandemic gradually declined over subsequent months, representing 5.2 percent of employment by September 2022. As the definition of *remote work because of the pandemic* became too narrow, starting in October 2022, the BLS added new supplemental questions to CPS that focused on remote work more generally and compared current trends with remote work as of February 2020.[4] According to the responses to the new supplemental questions, in recent months, almost 20 percent of workers reported working remotely for all or part of the survey reference week (green line). Recent usage of remote work appears well above February 2020 levels (black line), which were between 9 and 10 percent.

While remote work peaked in the immediate aftermath of the pandemic and was, in recent months, almost double the levels observed in February 2020, those usage indicators remain well below measures of remote ability. In particular, figure 1 also compares CPS definitions of remote work with a measure of remote ability built upon Montenovo et al. (2020).[5] Even at the peak of remote usage in May 2020, the gap between ability and actual remote work remained more than 10 percentage points. To more quickly contrast notions of remote ability and current usage, I propose a measure of *remote utilization*, defined as the ratio of the share of employment performing remote work to the share of jobs characterized by remote ability. Figure 2 identifies the behavior of remote utilization over our sample period. With limited variation in remote ability over short time horizons, remote utilization mostly reflects *actual usage* of remote work: It reached 40 percent in recent months (green line), about double the pre-pandemic levels (dashed line).

Did access to remote work and changes relative to the pre-pandemic period influence the labor market outcomes of different demographic groups? This work focuses primarily on differences by gender. To start with, figure 3 illustrates the features of remote ability and remote utilization across males and females. Historically, women have been employed in occupations with higher remote ability; a larger gap in ability between females and males opened up at the end of 2019 (left panel). The differences in ability explain why female remote utilization is slight below that of males (right panel); differences in utilization—of 3 percentage points (pp) as of February 2020—however, have become less pronounced over time.

Prime-age individuals have relied more on remote utilization. As shown in figure 4, levels of remote utilization are 20 pp higher than for the overall working population. Two other features of this graph deserve more attention. First, remote utilization for both male and female prime-age individuals was above 100 percent in May 2020; this issue could either reflect the relative rigidity

[3] In the CPS, whether a person worked remotely was determined through answers to the following question: "At any time in the last 4 weeks, did you telework or work at home for pay because of the coronavirus pandemic?" Among other survey measures, see Bartik et al. (2020) and Brynjolfsson et al. (2020).

[4] People who reported to working remotely are those who indicated they teleworked or worked at home for pay at any time during the survey reference week.

[5] Montenovo et al. (2020) characterize occupations as displaying the ability to work remotely if email, phone, and memo usage is very important; thus, their measure, thus, appears to identify occupations featuring "*remote communications*". See Langemeier and Tito (2022) for a discussion of an alternative measure proposed by Dingel and Neiman (2020) as well as implications on aggregate labor market outcomes.

of the measure of remote ability—in contrast with some short-term adaptability of jobs that could not generally be performed remotely and that adopted "remote attributes" in the immediate aftermath of the pandemic—or missing observations.[6]

Second, as with the entire working-age distribution, gaps in utilization have shrunk over the post-pandemic period, from 5 pp to a little over 3 pp. Interestingly, the gaps in utilization for prime-age groups are a touch higher than those for all employees.

Following the analysis by Bauer and Wang (2023), I further decompose remote utilization of prime-aged men and women by looking at the presence of own children aged 5 years or younger, an important determinant of labor force participation according to the literature. The left panel of figure 5 compares men and women in a household with no child aged 5 years or younger, while the right panel shows utilization measures across men and women with one or more young children.

Interestingly, while remote utilization has diverged between men and women with no young children, the gaps in utilization—which were also larger in the pre-pandemic period—have fully closed between men and women with young children; the utilization for women with young children was even at a slightly higher level compared to men in the latest CPS data.

While the analysis of figures 3-5 highlights changes in remote utilization and in access to remote work for prime-age women, and especially those with young children, I now move to address the labor market implications of those changes. As measures of utilization are available only over a short sample period, I'll focus on how access to remote work has shaped the labor market prospects of prime-age women relative to prime-age men. Langemeier and Tito (2022) underscore that there are general labor market benefits associated with occupations that can be performed remotely; here, I will dissect the differential impact across demographic group. My baseline analysis links labor market flows with my preferred measure of remote ability and observable demographics of the groups of interest,

$$y_{i,j\to k,st} = \beta_0 + \beta_1 Female_{it} + \beta_2 Remote\ Ability_{st} + \beta_1 Female_{it} \cdot Remote\ Ability_{st} + \varepsilon_{it} \quad \text{(a)}$$

where $y_{i,j\to k,st}$ is an indicator equal to 1 if individual i changes labor market status ($j \to k$) at time t, $Female_{it}$ is a dummy equal to 1 for prime-age women, and $Remote\ Ability_{st}$ denotes occupations where, according to the O*Net classification, the usage of e-mail, memo, and phone is important or very important.[7] In particular, I linked individuals across months and identified sequences of movements between inside and outside of the labor force as well as between employment and unemployment. The coefficient estimates of model (a) should be interpreted as indicating the probability of changing labor market status relative to an individual whose status does not change the following period. My analysis characterizes labor market flows across three

[6] Occupation codes are missing for about one-third of my CPS sample; furthermore, I am not able to assign a "remote" classification for an additional 5 percent of the observations in the CPS. Other than for the May 2020 episode, the measure of remote utilization appears well-behaved over the rest of the sample period and across different demographic dimensions.

[7] $y_{i,j\to k,st}$ is equal to 1 if the individual moves from status j to k; I set it equal to 0 if the individual remains in status j. Our sample is restricted to individuals aged 25 to 64 years.

dimensions: (1) for women, (2), for jobs that can be performed remotely, (3) for women in jobs that can be performed remotely; thus, the omitted category is that of men in jobs that cannot be performed remotely. Furthermore, I augment model (a) by controlling for a number of other demographic characteristics that are important correlates of remote ability as well as a large set of fixed effects (month, state-year, industry-year) that absorb the variation in labor market flows common across months, geographies, and industries.[8]

Table 1 summarizes the results for labor force flows (panel A) and employment flows (panel B) for prime-age individuals. Starting with panel A, the first three columns look at labor force entry flows—that is, from out to into the labor force. We find that (1) prime-age women are less likely to enter into the labor force, although the coefficient estimates are not significantly different from zero; (2) the ability to work remotely significantly boosts labor force entry for all prime-age individuals; (3) there is no differential effect on labor force entry for women, with the coefficient on the interaction *Female*Remote Ability* becoming insignificant in the full specification (column 3).

Columns 4-6 analyze flows of exit from the labor force—that is, from in to out of the labor force. We continue to find that (1) prime-age women are less attached to the labor force and more likely to exit, and that (2) the ability to work remotely significantly increases labor force attachment for all prime-age individuals. A novel finding in these columns is the additional differential benefit of remote ability for prime-age women: in fact, in contrast with the specifications in the first three columns, I find that prime-age women with access to remote jobs enjoy a lower probability of leaving the labor force. All told, women's ability to perform a job remotely almost entirely offsets their lower labor force attachment.

Panel B expands the analysis by looking at flows in and out of employment. While the characterization of employment flows for (1) prime-age women and for (2) jobs that can be performed remotely is fairly similar to that of labor force movements on both entry and exit margins, the evidence on the differential effects of remote ability for prime-age women is less robust, with only a marginally significant reduction in the probability of exiting employment in the full specification of column 6.

Table 2 explores whether the post-pandemic period brought changes in labor market flows across the same dimensions we highlighted above. Starting with panel A, except for an additional reduction in the probability of leaving the labor force for all prime-age individuals in the post-February-2020 period associated with remote ability, we do not find other significant post-pandemic changes in labor force movements.

Looking at employment flows in panel B, I document two main differences relative to the baseline analysis reported in table 1. First, prime-age men in jobs that can be performed remotely enjoyed an even higher likelihood of becoming employed in the post-pandemic period (columns 1-3). The same result does not apply to prime-age women as the coefficient on the interaction *Female*Remote Ability* Post Feb 2020* is negative and fully offset the impact of *Remote Ability*Post Feb 2020.* Second,

[8] I include the following demographics: age, race, ethnicity, education, marital status, citizenship, tenure, and metro dummies.

the impact on the probability of exiting the pool of employment for prime-age women is significant only after February 2020.

Taken together, these results suggest that changes to labor market flows for prime-age women brought by an increase in the share of jobs that can be performed remotely are not limited to the post-pandemic period but are likely reflective of broader labor market trends.[9]

Next, I'll explore whether the presence of young children creates a further dimension of the interplay between remote ability and labor market outcomes for prime-age women. The results are summarized in table 3, with panel A looking at labor force flows and panel B investigating employment flows. Once again, prime-age women display a lower probability of participating in the labor market, while remote ability remains an important positive determinant of labor market outcomes. The presence of young children has contrasting effects on labor force participation and employment status across prime-age men and women: in fact, while males with young children are more likely to enter and less likely to exit from either the labor force or employment, I find the opposite effect for prime-age women, a result which suggests that women are more likely to be responsible for caregiving. Some contrasting impact also applies to the ability to work from home, although with a reverse sign. In fact, prime-age men with young children employed in jobs that can be performed remotely appear more likely to exit from the labor force or leave employment; prime-age women with young children, instead, are less likely to exit from the labor force or leave employment if in an occupation that can be performed remotely.[10] All told, these findings suggests that remote ability increases labor force attachment for prime-age women, particularly those with young children, by reducing the probability of leaving the labor force or becoming unemployed. The impact on the entry margin, instead, is either muted, as in the case of labor force participation, or not different from that of men, as in the case of employment.

The evidence presented so far suggests that labor market gains from remote work for prime age-women could emerge on the exit margin—for example, after childbirth. Various studies suggest that, throughout early parenthood, a large share of women exhibit significant movements into and out of the labor force, with some variation explained by demographic factors or family circumstances.[11] We review the question of prime-age women's labor force attachment after childbirth through the lenses of the ability to work remotely. In particular, I further exploit the (limited) dynamic dimension in the CPS sample and look at the labor market status of women after giving birth, differentiating outcomes depending on whether the occupation could be performed remotely.

Table 4 reports the results an investigation that focuses on the month after birth. Consistent with my hypothesis and findings from tables 1-3, prime-age women are less likely to leave the labor force after childbirth if employed in jobs that can be performed remotely. The coefficient on the triple interaction, *Female * Remote * After Birth,* partly offsets the higher probability for prime-

[9] Similarly, we do not find significant changes in labor market outcomes for prime-age individuals with young children when comparing pre- and post-pandemic trends, as shown in table A1.
[10] In panel A, the interaction *Remote Ability*Young Child* is, instead, negative and significant for entry labor force flows, pointing to a lower probability of entry for both prime-age men and women.
[11] See, for example, Hynes and Clarkberg (2005) or Lu et al. (2017).

age women to leave the labor force immediately after childbirth.[12] These results, however, should be treated with caution as they are identified on the very small sample of individuals—around 13,000—experiencing a change in the presence of a child under 2 years of age since 2003.

What are the direct implications for labor force participation? Figure 6 takes a reduced-form approach and compares labor force participation rates between the group of jobs that can be performed remotely (*Remote*, green line) and the group of jobs that cannot be performed remotely (*Non-remote*, yellow line) for both prime-age men (left panel) and women (right panel). Interestingly, since 2011, the overall improvement in labor force participation for all prime-age individuals is entirely linked to occupations that can be performed remotely; conversely, participation in non-remote occupations was flat or slightly declining. More recently, however, the relative importance of the two groups in explaining participation across prime-age men and women has changed. While the gap in participation for prime-age men between remote and non-remote jobs had mostly closed just before the COVID-19 pandemic and, subsequently, participation rates for the two groups of jobs have moved roughly in parallel, prime-age women in remote jobs continued to experience gains in participation from access to remote work throughout 2021; as the labor market continued to tighten into 2023, gains in participation accrued more rapidly to women in jobs that could not be performed remotely. This evidence is consistent with our findings from tables 1 and 2 suggesting that gains in labor force attachment reflect longer-term trends in the labor market rather than just post-pandemic developments.

To answer the question on the gains in prime-age labor force participation related to remote ability from an alternative perspective, I propose a counterfactual experiment. I construct a measure of labor force participation for prime-age women in jobs that could be performed remotely as of April 2003, the first month Langemeier and Tito (2022) construct the O*Net-based remote classification of jobs. The comparison with this counterfactual measure highlights what would have happened to prime-age women's participation if there hadn't been any further advancement in remote ability after April 2003. Figure 7 compares the counterfactual measure of prime-age women's participation (teal line) with the actual participation (green line) that takes on board the expansion in the set of jobs that can be performed remotely.

The counterfactual experiment confirms the importance of remote ability in shaping long-term trends. While participation in remote jobs improved since 2011, even for those that were already considered remote as of April 2003, the adoption of remote features in other occupations implied an even faster improvement in prime-age women labor force participation. In the post-pandemic period, the improvement in the counterfactual measure starts to slightly dominate, particularly after 2022.

The last two exercises provide useful benchmarks to quantify the contribution of remote ability to the prime-age female labor force participation rate. In particular, the gap between participation in remote jobs and either non-remote participation or participation in occupations defined remote in the April 2003 classification identify differences that can be attributed to remote ability and its expansion over time. Table 5 summarizes the differences between prime-age women's participation in remote jobs and the two benchmarks; it also calculates the additional

[12] The limited panel structure of the CPS sample does not allow me to identify how the effect of having access to remote work evolves over subsequent months.

contributions—*Add.l Contribution* in columns (2) and *Add.l Counterfactual Contribution* in column (4)—from each gap to the aggregate prime-age female labor force participation rate: in particular, if remote participation and the benchmarks were to move at similar rates, they would imply equal contributions to the aggregate measure; instead, since remote participation has been moving up more, the gap from the benchmarks identifies the additional contribution to the aggregate measure.[13] The contribution to participation from remote ability, reported in column (2), has gradually increased over time, peaking in 2020, likely reflecting the effect of the pandemic. As shown in column 4, about 30 percent of the boost to participation from remote ability is due to the novel adoption of remote features in additional occupations. More recently, instead, labor market improvements appear related to gains in participation in jobs that cannot be performed remotely, with the improvements in remote participation smaller than that of the overall prime-age female participation rate.

Prime-age women with young children in remote jobs have also enjoyed larger gains in participation compared with the overall measure the aggregate. Figure 8 repeats the analysis of Figure 6 for the group of prime-age women with children aged 5 years or younger. As in the baseline case, access to occupations that can be performed remotely has been the main contributor to gains in participation since 2011. Importantly, gains have continued mostly throughout the post-pandemic period: after slowing in 2022 relative to non-remote occupation, participation of prime-age women with young children has continued to move up at a faster pace than non-remote participation in 2023, explaining about 10 basis point of the improvement in the overall LFPR.

The COVID-19 pandemic shifted the attention to remote work, normalizing *remote utilization*. While the shift towards higher remote utilization is relatively recent, the ability to work remotely—which has significantly increased over the past few decades—has long influenced labor market outcomes and has created favorable conditions for particular demographic groups—such as, prime-age women, especially those with young children. My analysis suggests that those groups have been capitalizing on the remote ability of their jobs and have been experiencing an increase in labor force attachment through a lower probability of exiting the labor force. Those gains, while particularly important at the height of the COVID-19 pandemic, are the results of long-term trends rather than recent changes; in fact, in recent years, the improvement in prime-age women labor force participation mostly reflects gains in occupations that cannot be performed remotely, as the labor market continued to tighten. Even so, the influence of remote ability on a wide variety of labor market outcomes is here to stay, despite ongoing questions on the implications for productivity.[14]

[13] The contributions take into account the shares of remote, non-remote, and counterfactual components into the aggregate.

[14] Pre-pandemic studies, such as Bloom et al. (2015) and Choudhury et al. (2021) point to productivity gains associated with remote work, while, more recently, Morikawa (2020), Atkin et al. (2023), and Gibbs et al. (2023) find a negative impact on productivity.

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Table 1: Remote Work and Labor Market Flows, Prime-Age Individuals

Panel A: Flows in and out of the Labor Force

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		$Entry_t$			$Exit_t$	
Female	-0.005	-0.006	-0.003	0.005***	0.005***	0.005***
	(0.005)	(0.005)	(0.005)	(0.001)	(0.001)	(0.001)
Remote Ability	0.019***	0.014***	0.015***	-0.003***	-0.002***	-0.002***
	(0.004)	(0.004)	(0.004)	(0.0005)	(0.0005)	(0.0005)
Female * Remote Ability	-0.013*	-0.011*	-0.010	-0.002***	-0.002***	-0.002***
	(0.007)	(0.006)	(0.006)	(0.001)	(0.001)	(0.001)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Obs.	16,077	16,077	16,077	1,694,078	1,694,078	1,694,078
R-squared	0.003	0.014	0.106	0.001	0.003	0.004

Panel B: Flows in and out of Employment

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		$Entry_t$			$Exit_t$	
Female	-0.005	-0.006	-0.019**	0.008**	0.008***	0.012***
	(0.011)	(0.009)	(0.008)	(0.004)	(0.003)	(0.002)
Remote Ability	0.082***	0.049***	0.049***	-0.030***	-0.018***	-0.017***
	(0.011)	(0.009)	(0.009)	(0.003)	(0.003)	(0.003)
Female * Remote Ability	-0.010	-0.006	-0.003	-0.003	-0.004	-0.005*
	(0.013)	(0.011)	(0.010)	(0.004)	(0.003)	(0.003)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Obs.	77,998	77,998	77,998	1,621,802	1,621,802	1,621,802
R-squared	0.010	0.064	0.102	0.006	0.024	0.036

Source: BLS CPS and O*Net.

$Entry_t$: indicator equal to 1 if the individual moves from out of the labor force into the labor force (panel A) or from unemployment to employment (panel B) between time *t* and *t-1*.

$Exit_t$: indicator equal to 1 if the individual moves from out of the labor force into the labor force (panel A) or from unemployment to employment (panel B) between time *t* and *t-1*.

Female: dummy equal to 1 for women.

Remote $Ability_t$: indicator equal to 1 for occupations that require high use of e-mails, memos, and telephone.

Legend: *** denotes significance at 1 percent level, ** significance at 5 percent, and * significance at 10 percent.

Notes: OLS regressions, 2003-2023. Columns (2)-(3) and (5)-(6) include worker observables (age, race, ethnicity, education, marital status, citizenship, tenure, and metro dummies); columns (3) and (6) also add month, state-year, and industry-year fixed effects. Robust standard errors, clustered at the occupation level, are reported in parenthesis.

Table 2: Remote Work and Labor Market Flows, Comparison with Post-Pandemic Outcomes, Prime-Age Individuals

Panel A: Flows in and out of the Labor Force

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		Entry			Exit	
Female	-0.008	-0.008	-0.005	0.005***	0.005***	0.005***
	(0.005)	(0.005)	(0.006)	(0.001)	(0.001)	(0.001)
Female * Post Feb 2020	0.009	0.008	0.007	0.001	0.001	0.001
	(0.012)	(0.012)	(0.013)	(0.001)	(0.001)	(0.001)
Remote Ability	0.017***	0.012***	0.012***	-0.003***	-0.001***	-0.001***
	(0.004)	(0.004)	(0.005)	(0.0005)	(0.0005)	(0.0005)
Remote Ability*Post Feb 2020	0.008	0.007	0.007	-0.002***	-0.002***	-0.002***
	(0.009)	(0.009)	(0.009)	(0.0005)	(0.0005)	(0.0005)
Female * Remote Ability	-0.013*	-0.012*	-0.011	-0.002***	-0.002***	-0.002***
	(0.007)	(0.007)	(0.007)	(0.001)	(0.001)	(0.001)
Female * Remote Ability * Post Feb 2020	-0.001	0.001	0.003	-0.001	-0.001	-0.001
	(0.016)	(0.016)	(0.016)	(0.001)	(0.001)	(0.001)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Obs.	16,077	16,077	16,077	1,694,078	1,694,078	1,694,078
R-squared	0.003	0.015	0.107	0.001	0.003	0.004

Panel B: Flows in and out of Employment

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		Entry			Exit	
Female	-0.009	-0.008	-0.023***	0.006	0.006**	0.011***
	(0.011)	(0.009)	(0.007)	(0.004)	(0.003)	(0.003)
Female * Post Feb 2020	0.018	0.011	0.022	0.007**	0.008**	0.004
	(0.016)	(0.015)	(0.015)	(0.003)	(0.003)	(0.003)
Remote Ability	0.079***	0.043***	0.041***	-0.029***	-0.017***	-0.016***
	(0.010)	(0.009)	(0.009)	(0.003)	(0.003)	(0.003)
Remote Ability*Post Feb 2020	0.026*	0.035***	0.033**	-0.002	-0.003	-0.004
	(0.014)	(0.013)	(0.013)	(0.003)	(0.003)	(0.003)
Female * Remote Ability	-0.005	-0.001	0.004	0.000	-0.001	-0.003
	(0.012)	(0.010)	(0.009)	(0.004)	(0.004)	(0.003)
Female * Remote Ability * Post Feb 2020	-0.021	-0.021	-0.032*	-0.010***	-0.009***	-0.006*
	(0.020)	(0.019)	(0.019)	(0.004)	(0.003)	(0.003)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Obs.	77,998	77,998	77,998	1,621,802	1,621,802	1,621,802
R-squared	0.013	0.066	0.104	0.006	0.024	0.037

Source: BLS CPS and O*Net.

$Entry_t$: indicator equal to 1 if the individual moves from out of the labor force into the labor force (panel A) or from unemployment to employment (panel B) between time t and t-1.

$Exit_t$: indicator equal to 1 if the individual moves from out of the labor force into the labor force (panel A) or from unemployment to employment (panel B) between time t and t-1.

Female: dummy equal to 1 for women.

Post Feb. 2020: indicator equal to 1 for months after Feb. 2020.

$Remote\ Ability_t$: indicator equal to 1 for occupations that require high use of e-mails, memos, and telephone.

Legend: *** denotes significance at 1 percent level, ** significance at 5 percent, and * significance at 10 percent.

Notes: OLS regressions, 2003-2023. All columns include the Post Feb. 2020 dummy. Columns (2)-(3) and (5)-(6) include worker observables (age, race, ethnicity, education, marital status, citizenship, tenure, and metro dummies); columns (3) and (6) also add month, state-year, and industry-year fixed effects. Robust standard errors, clustered at the occupation level, are reported in parenthesis.

Table 3: Remote Work and Labor Market Flows, Prime-Age Individuals by Presence of Young Children

Panel A: Flows in and out of the Labor Force

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		Entry			Exit	
Female	-0.001	-0.003	-0.001	0.003***	0.004***	0.003***
	(0.006)	(0.006)	(0.006)	(0.001)	(0.001)	(0.001)
Young Chld	0.029***	0.030***	0.031***	-0.002***	-0.002***	-0.002***
	(0.005)	(0.006)	(0.006)	(0.001)	(0.001)	(0.001)
Female * Young Chld	-0.022**	-0.017	-0.017	0.008***	0.008***	0.008***
	(0.011)	(0.012)	(0.012)	(0.001)	(0.001)	(0.001)
Remote Ability	0.022***	0.018***	0.019***	-0.003***	-0.002***	-0.002***
	(0.005)	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)
Remote Ability * Young Chld	-0.016**	-0.019***	-0.023***	0.000	0.001*	0.001*
	(0.006)	(0.006)	(0.007)	(0.000)	(0.000)	(0.000)
Female * Remote Ability	-0.014*	-0.011	-0.011	-0.002***	-0.002***	-0.001***
	(0.008)	(0.008)	(0.007)	(0.001)	(0.000)	(0.000)
Female * Remote Ability*Young Chld	0.005	0.004	0.008	-0.003***	-0.003***	-0.003***
	(0.015)	(0.015)	(0.016)	(0.001)	(0.001)	(0.001)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Obs.	16,077	16,077	16,077	1,694,078	1,694,078	1,694,078
R-squared	0.005	0.016	0.108	0.002	0.003	0.004

Panel B: Flows in and out of Employment

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		Entry			Exit	
Female	0.009	0.003	-0.009	0.003	0.005*	0.008***
	(0.011)	(0.009)	(0.008)	(0.003)	(0.003)	(0.002)
Young Chld	0.042***	0.014*	0.015**	-0.011***	-0.002**	-0.003**
	(0.008)	(0.007)	(0.007)	(0.001)	(0.001)	(0.001)
Female * Young Chld	-0.072***	-0.045***	-0.045***	0.025***	0.018***	0.018***
	(0.013)	(0.012)	(0.012)	(0.003)	(0.002)	(0.002)
Remote Ability	0.083***	0.053***	0.052***	-0.030***	-0.019***	-0.018***
	(0.012)	(0.010)	(0.009)	(0.003)	(0.003)	(0.003)
Remote Ability * Young Chld	-0.003	-0.011	-0.010	0.003**	0.004***	0.004***
	(0.010)	(0.010)	(0.010)	(0.001)	(0.001)	(0.001)
Female * Remote Ability	-0.018	-0.013	-0.008	0.000	-0.001	-0.002
	(0.013)	(0.011)	(0.010)	(0.004)	(0.003)	(0.003)
Female * Remote Ability*Young Chld	0.035**	0.026	0.022	-0.016***	-0.013***	-0.013***
	(0.017)	(0.016)	(0.016)	(0.003)	(0.003)	(0.002)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Obs.	77,998	77,998	77,998	1,621,802	1,621,802	1,621,802
R-squared	0.011	0.064	0.103	0.007	0.024	0.036

Source: BLS CPS and O*Net.

to employment (panel B) between time t and $t-1$.

employment (panel B) between time t and $t-1$.

Female: dummy equal to 1 for women.

Young Chld: presence of own 1 or more children aged 5 years or younger.

Remote Ability$_t$: indicator equal to 1 for occupations that require high use of e-mails, memos, and telephone.

Legend: *** denotes significance at 1 percent level, ** significance at 5 percent, and * significance at 10 percent.

Notes: OLS regressions, 2003-2023. Columns (2)-(3) and (5)-(6) include worker observables (age, race, ethnicity, education, marital status, citizenship, tenure, and metro dummies); columns (3) and (6) also add month, state-year, and industry-year fixed effects. Robust standard errors, clustered at the occupation level, are reported in parenthesis.

Table 4: Remote Work and Labor Force Participation of Prime-Age Individuals Around Childbirth

Exit from the Labor Force

Variables	(1)	(2) Exit	(3)
Remote	-0.002***	-0.002***	-0.002***
	(0.000)	(0.000)	(0.001)
After Birth	0.002	0.002	-0.002
	(0.001)	(0.001)	(0.001)
Remote * After Birth	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)
Female	0.000	0.000	0.001
	(0.002)	(0.002)	(0.002)
Female * After Birth	0.027***	0.028***	0.027***
	(0.005)	(0.005)	(0.005)
Female * Remote	0.001*	0.001*	0.001*
	(0.001)	(0.001)	(0.001)
Female * Remote * After Birth	-0.011**	-0.012**	-0.011**
	(0.005)	(0.005)	(0.005)
Worker Observables	n	y	y
Month FE	n	n	y
State-Year FE	n	n	y
Industry-Year FE	n	n	y
Occupation-Year FE	n	n	y
Obs.	1,694,078	1,694,078	1,694,078
R-squared	0.001	0.003	0.008
Num. IDs	1,080,993	1,080,993	1,080,993

Source: BLS CPS and O*Net.

Exit: indicator equal to 1 if the individual moves from in to out of the labor force.

After Birth: Dummy equal to 1 for prime-age individuals in the month after they experience a change in the presence of children aged 2 years or younger.

Female: dummy equal to 1 for women.

Remote: indicator equal to 1 for occupations that require high use of e-mails, memos, and telephone.

Legend: *** denotes significance at 1 percent level, ** significance at 5 percent, and * significance at 10 percent.

Notes: FE regressions, 2003-2023. Columns (2) and (3) include worker observables (age, race, ethnicity, education, marital status, citizenship, tenure, and metro dummies); column (3) also adds month, state-year, and industry-year fixed effects. Robust standard errors are reported in parenthesis.

Table 5: Contribution of Remote Ability to Prime-Age Women Labor Force Participation

Period	(1) Remote vs. Non-Remote (pp)	(2) Add.l Contribution (pp)	(3) Counterfactual (pp)	(4) Add.l Counterfactual Contribution (pp)
2012-2015	1.73	0.73	0.54	0.23
2016-2019	4.91	1.46	1.91	0.63
2020	10.29	2.72	4.01	1.06
2021	11.03	0.38	4.13	0.06
2022	10.55	-0.25	3.93	-0.10
2023	9.71	-0.43	3.66	-0.14

Source: BLS and O*Net

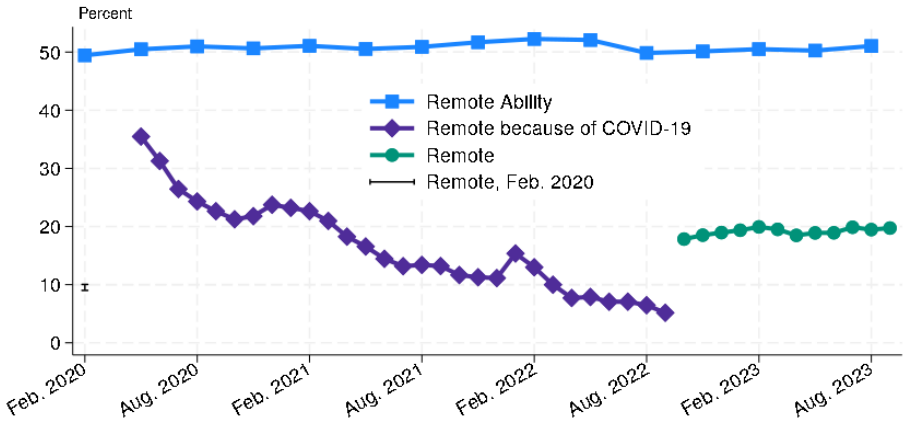
Remote vs. Non-Remote: Difference between LFPR at jobs that can be performed remotely vs. jobs that cannot be performed remotely for prime-age women.

Counterfactual: Difference between LFPR at jobs that can be performed remotely vs. LFPR at jobs that could be performed remotely in April 2003.

Note: Contribution of the remote work to changes in the prime-age women's LFPR. Column (2) reflects the impact of the Remote vs. Non-Remote Gap, while columns (4) reports the effect of the Counterfactual Gap.

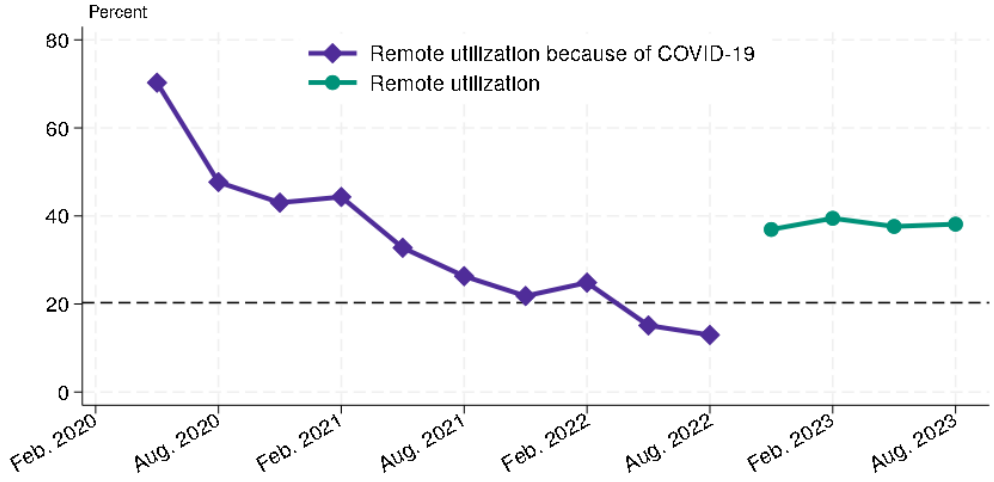
FIGURES

Figure 1: Remote Work vs. the Ability to Work Remotely



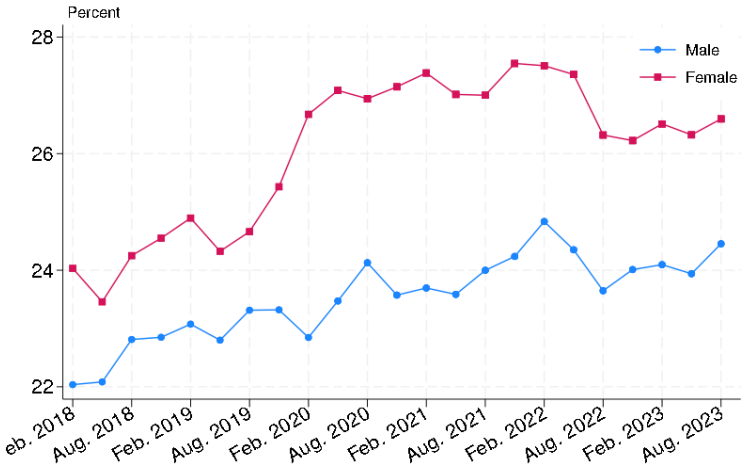
Source: U.S. Census Bureau and U.S. Department of Labor, Employment and Training Administration (USDOL/ETA).
Note: Comparison between the share of employment in occupations with the ability to work remotely and reports of remote work from survey respondents.

Figure 2: Remote Utilization



Source: U.S. Census Bureau and USDOL/ETA.
Note: Ratio of remote usage to remote ability. Black dashed line represents remote utilization as of February 2020.

Figure 3: Remote Ability and Remote Utilization by Gender

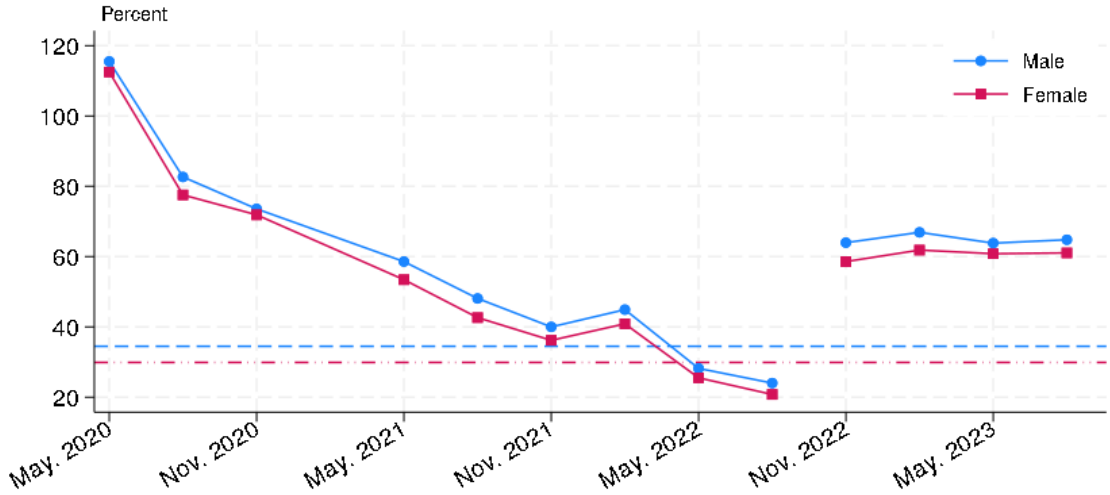


Source: U.S. Census Bureau and USDOL/ETA.
Note: Share of employment by gender in occupations that can be performed re



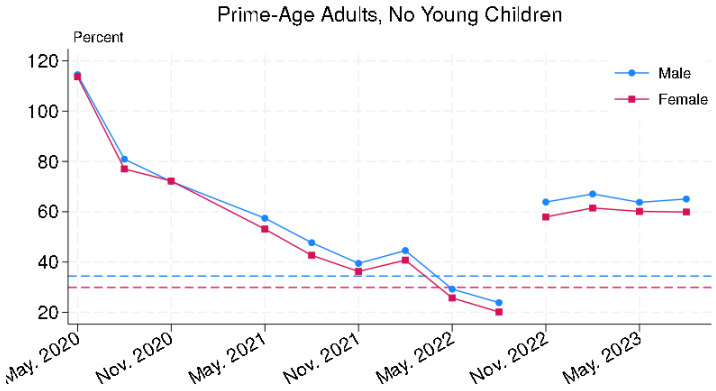
Source: U.S. Census Bureau and USDOL/ETA.
Note: Utilization of remote work by gender. Data through September 2022 refe
remote work because of the COVID-19 pandemic; data after October 2022 refe
remote work more generally. Dashed line denotes pre-pandemic utilization for
males, while dash-dotted line is for females.

Figure 4: Remote Utilization by Gender for Prime-Age Adults

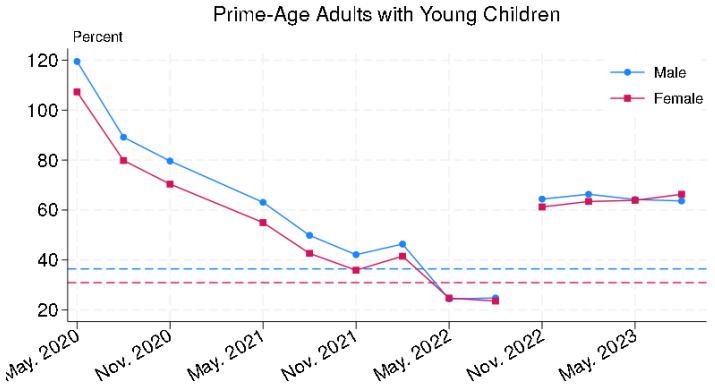


Source: U.S. Census Bureau and USDOL/ETA.
Note: Utilization of remote work by gender for prime-age individuals. Data through September 2022 refer to remote work because of the COVID-19 pandemic; data after October 2022 refer to remote work more generally. Dashed line denotes pre-pandemic utilization for males, while dash-dotted line is for females.

Figure 5: Remote Utilization for Prime-Age Males and Females by Presence of Young Children (0-5 years of age)

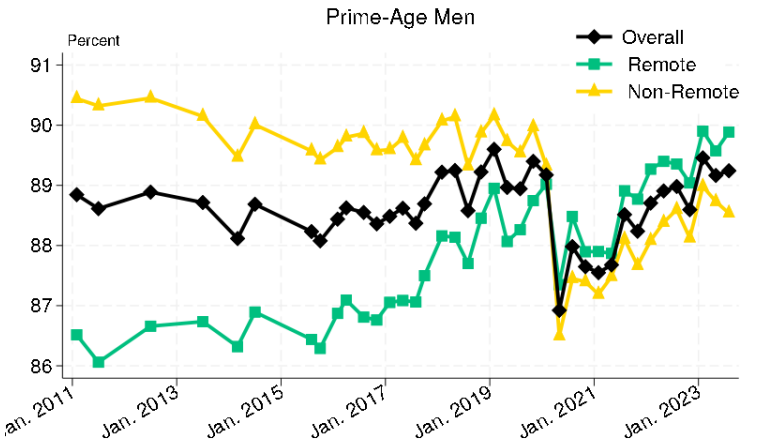


Source: BLS CPS and O*Net.
Note: Utilization of remote work by gender for adults aged 25 to 54 years old
below 5 years of age. Data through September 2022 refer to remote work bec
COVID-19 pandemic; data after October 2022 refer to remote work more gen
line denotes pre-pandemic utilization for males, while pink dashed line is for f

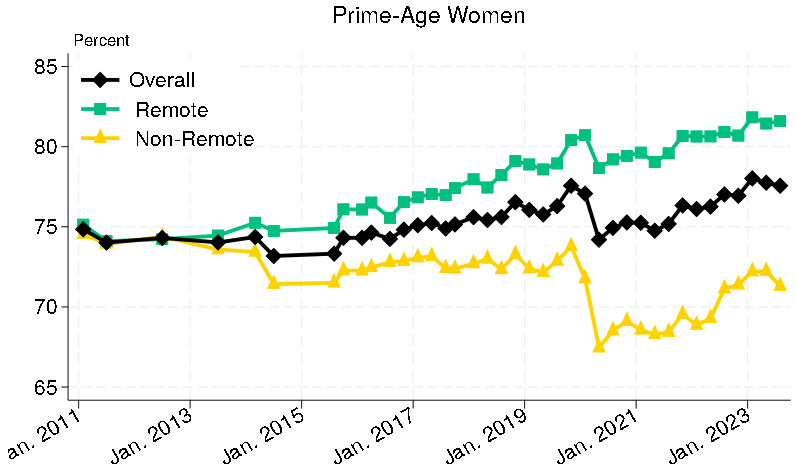


Source: BLS CPS and O*Net.
Note: Utilization of remote work by gender for adults aged 25 to 54 years with
below 5 years of age. Data through September 2022 refer to remote work bec
COVID-19 pandemic; data after October 2022 refer to remote work more gen
line denotes pre-pandemic utilization for males, while pink dashed line is for f

Figure 6: Labor Force Participation, Prime-Age Individuals

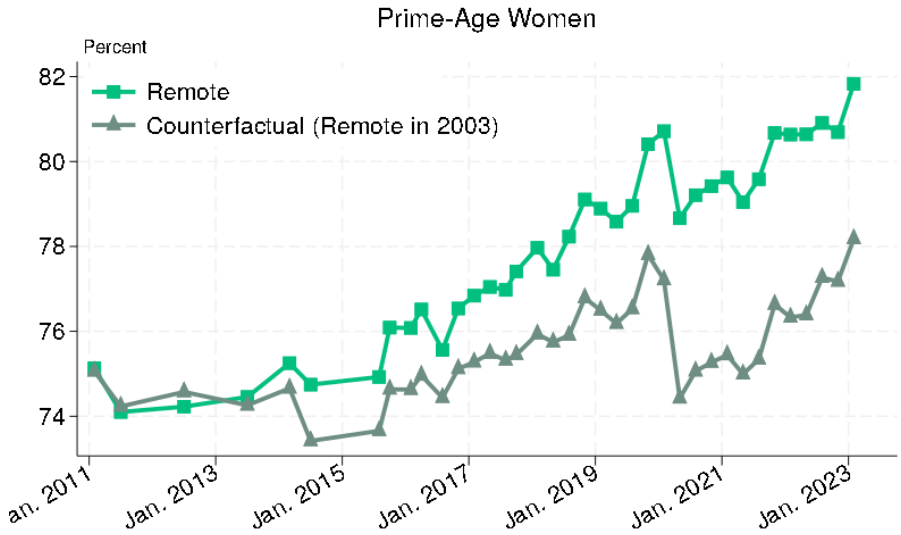


Source: BLS and O*Net.
Note: Labor force participation rate for prime-age men in jobs that can be perf
vs. jobs that cannot be performed remotely.



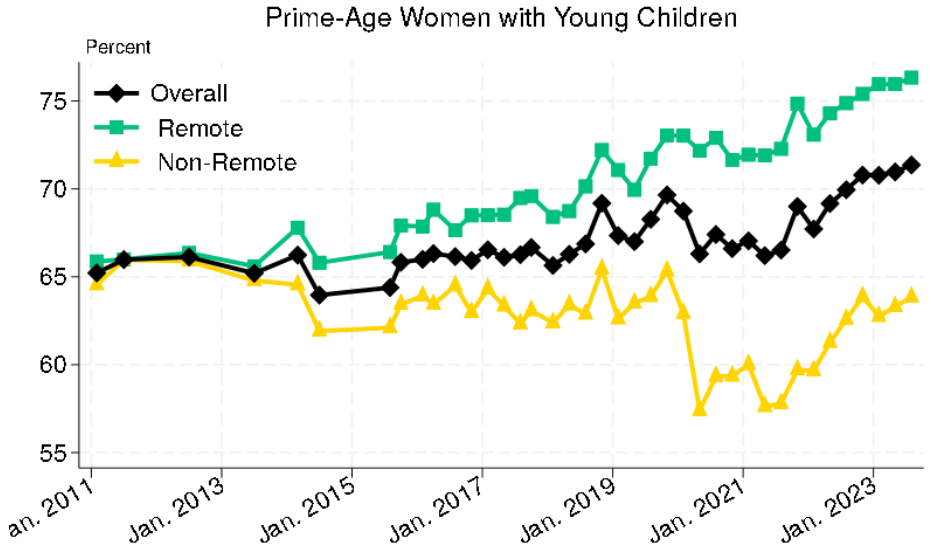
Source: BLS and O*Net.
Note: Labor force participation rate for prime-age women in jobs that can be p
vs. jobs that cannot be performed remotely.

Figure 7: Counterfactual Experiment: Prime-Age Women Labor Force Participation, Current Remote Ability vs. Remote Ability as of April 2003



Source: BLS and O*Net.
Note: Labor force participation rate for prime-age women in jobs that can be p
vs. jobs that can be performed remotely as of APril 2003.

Figure 8: Labor Force Participation: Remote vs. Non-Remote Occupations



Source: BLS and O*Net.
Note: Labor force participation rate for prime-age women with one or more chi
or younger in jobs that can be performed remotely vs. jobs that cannot be perf

Table A1: Remote Work and Labor Market Flows, Prime-Age Individuals by Presence of Young

Panel A: Flows in and out of the Labor Force

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		Entry			Exit	
Female	-0.005	-0.006	-0.003	0.003***	0.003***	0.003***
	(0.006)	(0.006)	(0.007)	(0.001)	(0.001)	(0.001)
Young Chld	0.026***	0.027***	0.028***	-0.002***	-0.002***	-0.002***
	(0.006)	(0.006)	(0.006)	(0.000)	(0.000)	(0.000)
Female * Young Chld	-0.016	-0.010	-0.013	0.008***	0.008***	0.008***
	(0.012)	(0.012)	(0.012)	(0.001)	(0.001)	(0.001)
Female * Young Chld*Post Feb 2020	-0.025		-0.014	0.000	0.000	
	(0.022)		(0.024)	(0.001)	(0.001)	
Remote Ability	0.020***	0.015***	0.016***	-0.003***	-0.001***	-0.001***
	(0.006)	(0.005)	(0.005)	(0.000)	(0.000)	(0.000)
Remote Ability * Young Chld	-0.014**	-0.017**	-0.019**	0.000	0.001*	0.001*
	(0.007)	(0.007)	(0.008)	(0.000)	(0.000)	(0.000)
Remote Ability * Young Chld*Post Feb 2020	-0.007	-0.010	-0.015	0.000	0.000	
	(0.014)	(0.014)	(0.017)	(0.001)	(0.001)	
Female * Remote Ability	-0.014	-0.012	-0.012	-0.001**	-0.001***	-0.001**
	(0.008)	(0.008)	(0.008)	(0.001)	(0.001)	(0.000)
Female * Remote Ability*Young Chld	0.004	0.003	0.009	-0.004***	-0.004***	-0.004***
	(0.016)	(0.016)	(0.017)	(0.001)	(0.001)	(0.001)
Female * Remote Ability*Young Chld*Post Feb 20	-0.001	0.001	0.004	-0.001	-0.001	-0.001
	(0.018)	(0.018)	(0.018)	(0.001)	(0.001)	(0.001)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Observations	16,077	16,077	16,077	1,694,078	1,694,078	1,694,078
R-squared	0.005	0.017	0.109	0.002	0.003	0.005

Panel B: Flows in and out of Employment

	(1)	(2)	(3)	(4)	(5)	(6)
Variables		Entry			Exit	
Female	0.004	-0.002	-0.016**	0.001	0.003	0.007***
	(0.010)	(0.008)	(0.007)	(0.004)	(0.003)	(0.002)
Young Chld	0.040***	0.006	0.009	-0.011***	-0.003**	-0.003***
	(0.007)	(0.008)	(0.008)	(0.001)	(0.001)	(0.001)
Female * Young Chld	-0.068***	-0.034***	-0.037***	0.026***	0.019***	0.019***
	(0.013)	(0.012)	(0.012)	(0.003)	(0.002)	(0.002)
Female * Young Chld*Post Feb 2020						
Remote Ability	0.079***	0.045***	0.042***	-0.030***	-0.018***	-0.017***
	(0.011)	(0.009)	(0.009)	(0.004)	(0.003)	(0.003)
Remote Ability * Young Chld	-0.002	-0.006	-0.008	0.003**	0.004***	0.004***
	(0.010)	(0.011)	(0.012)	(0.002)	(0.001)	(0.001)
Remote Ability * Young Chld*Post Feb 2020		-0.020	-0.012	-0.000	-0.001	-0.001
		(0.027)	(0.027)	(0.003)	(0.003)	(0.003)
Female * Remote Ability	-0.010	-0.006	-0.003	-0.003	-0.004	-0.005*
	(0.013)	(0.011)	(0.010)	(0.004)	(0.003)	(0.003)
Female * Remote Ability*Young Chld	-0.023	-0.026	-0.033*	-0.011***	-0.010***	-0.007**
	(0.020)	(0.021)	(0.020)	(0.004)	(0.003)	(0.003)
Female * Remote Ability*Young Chld*Post Feb 20	0.013	0.031	0.016	0.003	0.004	0.004
	(0.033)	(0.042)	(0.042)	(0.005)	(0.005)	(0.005)
Worker Observables	n	y	y	n	y	y
Month FE	n	n	y	n	n	y
State-Year FE	n	n	y	n	n	y
Industry-Year FE	n	n	y	n	n	y
Observations	77,998	77,998	77,998	1,621,802	1,621,802	1,621,802
R-squared	0.014	0.066	0.104	0.007	0.024	0.037

Source: BLS CPS and O*Net.

Entry$_t$: indicator equal to 1 if the individual moves from out of the labor force into the labor force (panel A) or from unemployment to employment (panel B) between time *t* and *t-1*.

Exit$_t$: indicator equal to 1 if the individual moves from out of the labor force into the labor force (panel A) or from unemployment to employment (panel B) between time *t* and *t-1*.

Female: dummy equal to 1 for women.

Young Chld: presence of own 1 or more children aged 5 years or younger.