

When My Job Didn't Go: The Ability to Work Remotely

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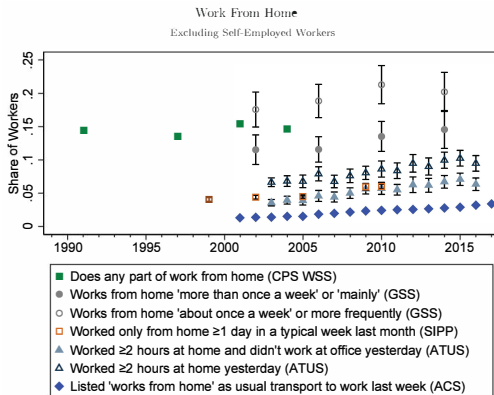
November 1, 2023

IRE: Where Did My Job Go?

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A Shift to Remote Work

- According to individual- and firm-level surveys, between 35 and 45 percent of employees switched to remote work at the onset of the COVID-19 pandemic.
 - ▶ Through early 2020, the share of people who worked from home had remained at relatively low and constant levels (Mas and Pallais, 2020)



A Shift to Remote Work

- According to individual- and firm-level surveys, between 35 and 45 percent of employees switched to remote work at the onset of the COVID-19 pandemic.
 - ▶ Through early 2020, the share of people who worked from home had remained at relatively low and fairly constant levels (Mas and Pallais, 2020)
- How was the shift to remote work possible?
 - ▶ Let's look into the “ability to work remotely”

Measuring the Ability to Work Remotely

- Two main measures, based on the Occupation Information Network (O*Net) survey of abilities by occupation
 - ▶ **Remote Communications**, based on Montenovo et al. (2020).
This measure focuses on email, phone, and memo usage
 - ▶ **No Physical Presence**, based on Dingel and Neiman (2020).
This measure flags physical aspects of jobs—such as, physically dealing with violent people; being exposed to disease or infection; inspecting equipment, structure, or materials; etc.

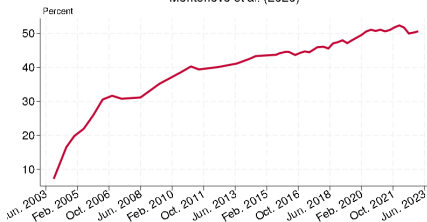
The Ability to Work Remotely Before the Pandemic

- To measure the significance of remote work in overall employment, we match the O*Net occupation indexes with the Bureau of Labor Statistics (BLS) Current Population Survey.
- In February 2020,
 - ▶ Share of employment in occupations characterized by **Remote Communications**: 49.5 percent.
 - ▶ Share of employment in occupations characterized by **No Physical Presence**: 41 percent.

How Did the Ability to Work Remotely Evolve Over Time?

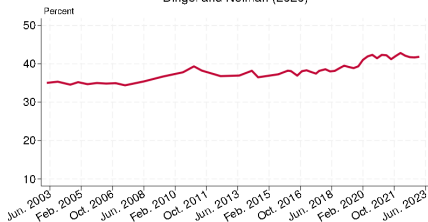
- Employment in occupations characterized by **Remote Communications** has increased dramatically, while minimal changes for occupations characterized by **No Physical Presence**.
 - ▶ Looking at other data sources (CPS 2004 Supplement), share of employment in jobs with the ability to be remote—at 15 percent—seems more consistent with the **Remote Communications**' characterization.

Remote Communications
Montenovo et al. (2020)



Source: BLS' Current Population Survey (CPS) and O*Net.
Note: Share of employment in occupations with indices of e-mail, phone, and memo usage above 4. Data through May 2023.

No Physical Presence
Dingel and Neiman (2020)

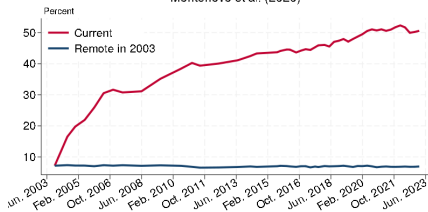


Source: BLS' Current Population Survey (CPS) and O*Net.
Note: Share of employment in occupations that do not require physical presence. Data through May 2023.

The Rise of “New” Remote Jobs: A Decomposition Analysis

- What are those changes in ability related to?
 - ▶ Look at jobs classified as *remote* in 2003, the beginning of our sample.
 - ▶ If only those jobs were attracting more employees, they would account for the evolution of the measures of ability.
 - ▶ Instead, the evolution is mainly driven by jobs taking on board *remote features*

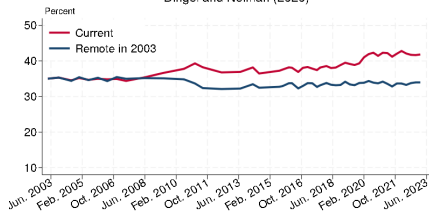
Remote Communications
Montenovo et al. (2020)



Source: BLS CPS and O*Net.

Note: Share of employment in occupations with current indices of e-mail, phone, and memo usage above 4 compares with occupations with usage above 4 since 2003m4. Data through May 2023.

No Physical Presence
Dingel and Neiman (2020)

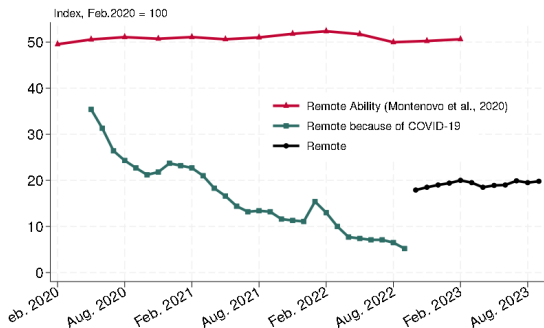


Source: BLS CPS and O*Net.

Note: Share of employment in occupations that currently do not require physical presence compared with occupations that did not require physical presence in 2003. Data through May 2023.

Are Workers Taking Advantage of the “Remote Ability” of their Job?

- Recently, CPS started to track whether individuals have been working remotely.
 - ▶ After peaking in May, “actual” remote work because of the pandemic has gradually subsided.
 - ▶ About 20 percent of employment engaged in remote work in recent months.



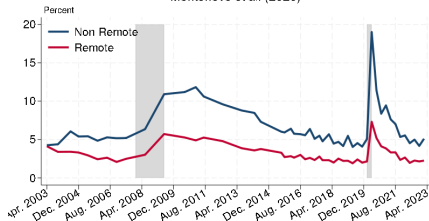
Source: BLS CPS and O*Net.

Notes: Share of employment in occupations with remote communications vs. share of workers reporting to work remotely.

Remote Work and (Un)Employment Outcomes

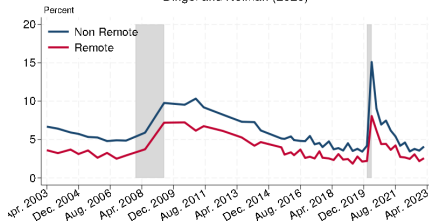
- Unemployment rate of occupations with remote potential is lower; the difference is more pronounced in the COVID-19 recession.
 - ▶ The difference is significant, even after accounting for demographics, geographic characteristics, and industry composition.

Remote Communications
Montenovo et al. (2020)



Source: BLS' Current Population Survey (CPS) and O*Net.
Note: Unemployment rates across occupations with different remote ability.

No Physical Presence
Dingel and Neiman (2020)



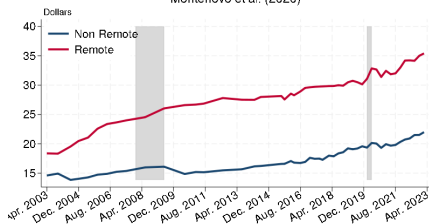
Source: BLS' Current Population Survey (CPS) and O*Net.
Note: Unemployment rates across occupations with different remote ability.

Demographic Characteristics, Unemployment: Regression results

Remote Work And Hourly Wages

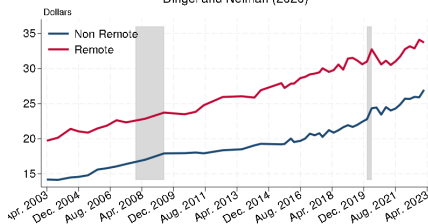
- Occupations with remote potential also enjoy higher wages; the wage premium does not appear to change around recessions.
 - ▶ The difference is significant, even after accounting for demographics, geographic characteristics, and industry composition.

Remote Communications
Montenovo et al. (2020)



Source: BLS' Current Population Survey (CPS) and O*Net.
Note: Hourly wages rates across occupations with different remote ability.

No Physical Presence
Dingel and Neiman (2020)



Source: BLS' Current Population Survey (CPS) and O*Net.
Note: Hourly wages rates across occupations with different remote ability.

- Wages: Regression results

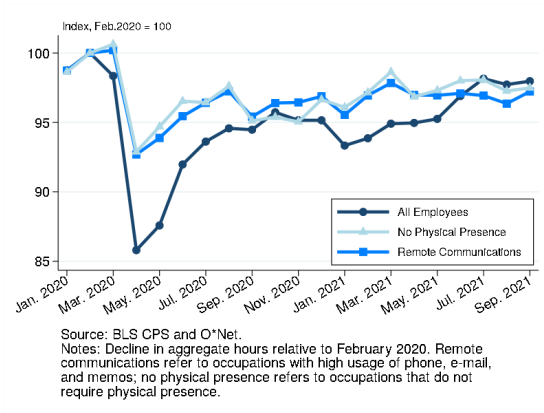
Remote Work during the Pandemic

How important was the ability to work remotely during the pandemic?

- Previous analysis suggests that the unemployment rate of workers in occupations that provided the ability to work remotely increased by less than the unemployment rate of other workers.
- To measure the contribution of “remote work” in softening the impact of the pandemic recession, let’s look at the change in aggregate hours across occupations.

Remote Work during the Pandemic: Measuring the Decline in Hours

- Relative to Feb. 2020, hours in remote occupations by either measure fell remarkably less than in all occupations.
- There are only small differences between the two measures.

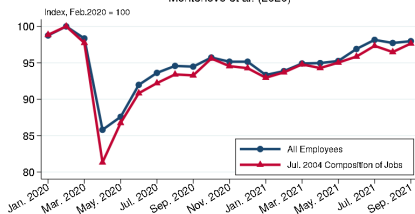


Counterfactual Experiment: Ability to Work Remotely as in 2004

What would have happened if the ability to work remotely had not changed?

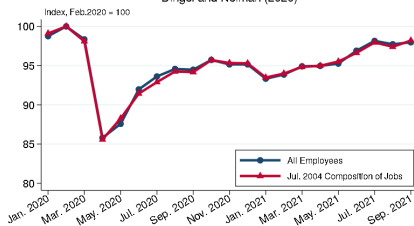
- Consider occupations with the ability to work remotely in February 2020 but not in July 2004.
- Assign to those occupations the average decline in hours of non-remote occupations over the recession period rather than the actual decline.
- Little changes for “no physical presence”, but substantial larger drop for “remote communications”.

Remote Communications
Montenovo et al. (2020)



Source: BLS CPS and O*Net.
Notes: Decline in aggregate hours relative to February 2020. Remote communications refer to occupations with high usage of phone, e-mail, and memos.

No Physical Presence
Dingel and Neiman (2020)



Source: BLS CPS and O*Net.
Notes: Decline in aggregate hours relative to February 2020. No physical presence refers to occupations that do not require physical presence.

Counterfactual Experiment: Impact on GDP

- Very different behavior of the two measures.
 - ▶ Slight differences between the counterfactual scenario for the no physical presence index and the actual decline in hours.
 - ▶ Using the remote communications, index, the increase in the ability of remote work prevented a further decline in hours of 0.9 percentage points (pp) in 2020Q1 and of 5.6 pp in 2020Q2.

Table 5. Working from Home: Impact on Hours

	2020			
	Q1	Q2	Q3	Q4
(1) Total Hours Decline (a.r.)	-3.6%	-36.5%	25.8%	7.2%
Countefactuals as of Jul. 2004				
(2) No Physical Presence	-3.7%	-36.6%	26.6%	7.3%
(3) Remote Communications	-4.5%	-42.1%	35.3%	8.2%
(4) Memo: GDP growth (a.r.)	-4.9%	-31.3%	33.6%	4.5%

Source: BLS CPS, O*Net, and authors' calculations.

Note: Total hours decline denotes the aggregate decline in usual hours. The counterfactual scenarios assume that occupations that could not performed at home in July 2004 by either measure experienced the same declines as non-teleworkable occupations in 2020 during the pandemic recession.

Conclusions

- The ability of working remotely has had a meaningful impact on aggregate hours during the pandemic through two channels
 - ▶ Increase in the ability of working remotely with the adoption of remote communications
 - ▶ Switch to remote work for those occupations requiring no physical presence
- Even abstracting from productivity, the flexibility on hours worked are likely to be an important margin in labor market outcomes.

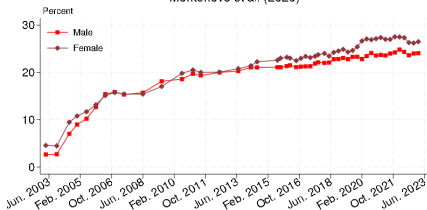
Appendix: Demographics Characteristics and Remote Work

- Decomposing the share of employment in remote work across 4 dimensions
 - ▶ Gender
 - ▶ Race and Ethnicity
 - ▶ Age
 - ▶ Education
- People in remote work are more likely to be white, 25-64, and college-educated; not significant differences in terms of gender.
- Relatively similar behavior of the two measures.

Remote Work: Differences by Gender

Remote Communications

Montenovo et al. (2020)

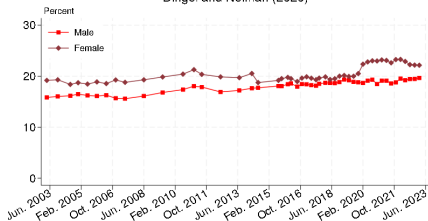


Source: Bureau of Labor Statistics.

Note: Employment shares by gender in occupations characterized by a high ability of working remotely, that is, by indices of e-mail, phone, and memo usage above 4.

No Physical Presence

Dingel and Neiman (2020)



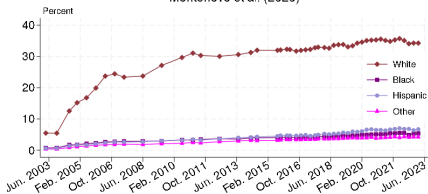
Source: BLS CPS and O*Net.

Note: Employment shares by gender in occupations that do not require physical presence.

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Remote Work: Differences by Race/Ethnicity

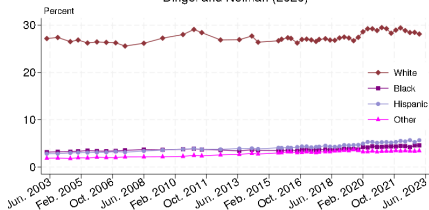
Remote Communications
Montenovo et al. (2020)



Source: BLS CPS and O*Net.

Note: Employment shares by race and ethnicity in occupations characterized by a high ability of working remotely, that is, by indices of e-mail, phone, and memo usage above 4. Other denotes Asian, American Indian or Alaska Native, and Native Hawaiian or Other Pacific Islander.

No Physical Presence
Dingel and Neiman (2020)



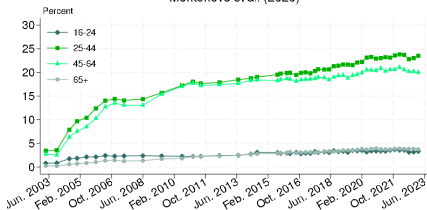
Source: BLS CPS and O*Net.

Note: Employment shares by race and ethnicity in occupations that do not require physical presence. Other denotes Asian, American Indian or Alaska Native, and Native Hawaiian or Other Pacific Islander.

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Remote Work: Differences by Age

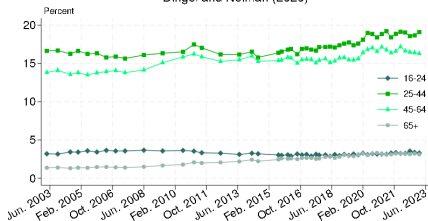
Remote Communications
Montenovo et al. (2020)



Source: BLS CPS and O*Net.

Note: Employment shares by age in occupations characterized by a high ability of working remotely, that is, by indices of e-mail, phone, and memo usage above 4.

No Physical Presence
Dingel and Neiman (2020)



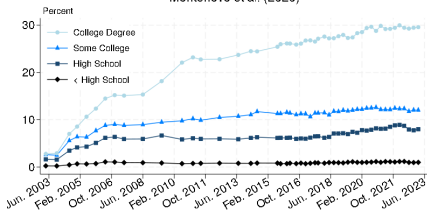
Source: BLS CPS and O*Net.

Note: Employment shares by age in occupations that do not require physical presence.

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Remote Work: Differences by Education

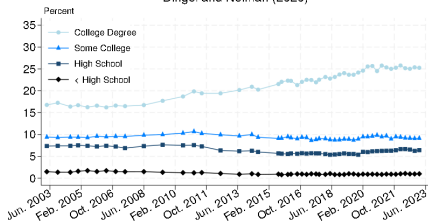
Remote Communications
Montenovo et al. (2020)



Source: BLS CPS and O*Net.

Note: Employment shares by education in occupations characterized by a high ability of working remotely, that is, by indices of e-mail, phone, and memo usage above 4.

No Physical Presence
Dingel and Neiman (2020)



Source: BLS CPS and O*Net.

Note: Employment shares by education in occupations that do not require physical presence.

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Remote Work and Unemployment Probability

Table 1: Remote Work and Unemployment Probability

Variables	(1)	(2)	(3)	(4)	(5)	(6)
			Unemployed, _{<i>t</i>}			
No Physical Presence,	-0.020*** (0.004)	-0.007** (0.003)	-0.006* (0.003)			
Remote Comm,				-0.033*** (0.004)	-0.017*** (0.003)	-0.017*** (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.	55,485	55,485	55,485	2,008,383	2,008,383	2,008,383
R-squared	0.003	0.023	0.027	0.009	0.032	0.039

Source: BLS CPS and O*Net.

Unemployed_{*t*}: indicator equal to 1 if unemployed at time *t*.

Physical Presence_{*t*}: indicators equal to 1 for occupations that do not require physical presence.

Remote Comm_{*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: Cross-sectional regressions. Columns (2)-(3) and (5)-(6) include worker observables (age, gender, 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.

Remote Work during the Pandemic: Unemployment

Table 3: Remote Work and Probability of Being Unemployed during the Pandemic

Variables	(1)	(2)	(3)	(4)	(5)	(6)
				Unemployed,		
No Physical Presence,	-0.029*** (0.007)	-0.012** (0.005)	-0.006 (0.005)			
No Physical Presence, * Pandemic,	-0.018*** (0.005)	-0.018*** (0.005)	-0.014*** (0.004)			
Remote Comm,				-0.054*** (0.006)	-0.039*** (0.005)	-0.035*** (0.005)
Remote Comm, * Pandemic,				-0.030*** (0.005)	-0.031*** (0.005)	-0.027*** (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
Obs.	866,974	866,974	866,974	865,731	865,731	865,731
R-squared	0.004	0.037	0.059	0.013	0.042	0.063

Source: BLS CPS and O*Net.

Unemployed_{*t*}: indicator equal to 1 if unemployed at time *t*.

Physical Presence_{*t*}: indicators equal to 1 for occupations that do not require physical presence.

Pandemic_{*t*}: indicator equal to 1 for March and April 2020.

Remote Comm_{*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: Cross-sectional regressions. Columns (2)-(3) and (5)-(6) include worker observables (age, gender, 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.

- Workers in remote occupations by either measure were even less likely to be unemployed in March and April 2020.

Remote Work and Wages

Table 2: Remote Work and Wage Effects

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Log Hourly Wage _{<i>t</i>}					
No Physical Presence _{<i>t</i>}	0.341*** (0.061)	0.137*** (0.041)	0.100*** (0.038)			
Remote Comm _{<i>t</i>}				0.516*** (0.054)	0.273*** (0.038)	0.224*** (0.035)
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.	11,672	11,672	11,672	419,389	419,389	419,389
R-squared	0.065	0.334	0.374	0.154	0.366	0.415

Source: BLS CPS and O*Net.

Log Hourly Wage_{*t*}: hourly wage, in log-s, at time *t*.

Physical Presence_{*t*}: indicators equal to 1 for occupations that do not require physical presence.

Remote Comm_{*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: Cross-sectional regressions. Columns (2)-(3) and (5)-(6) include worker observables (age, gender, 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.

- A worker in an occupation that require no physical presence → 15 percent of a standard deviation (sd) higher hourly wage.
- A worker employed in occupations characterized by remote communications → 35 percent of a sd higher hourly wage.

Remote Work during the Pandemic: Wages

Table 4: Remote Work and Wages during the Pandemic

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Log Hourly Wage _{<i>t</i>}					
No Physical Presence _{<i>t</i>}	0.317*** (0.058)	0.120*** (0.038)	0.087** (0.035)			
No Physical Presence, * Pandemic _{<i>t</i>}	-0.006 (0.012)	0.003 (0.010)	0.003 (0.010)			
Remote Comm _{<i>t</i>}				0.468*** (0.048)	0.251*** (0.030)	0.225*** (0.026)
Remote Comm, * Pandemic _{<i>t</i>}				-0.011 (0.011)	0.008 (0.010)	0.008 (0.010)
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	182,335	182,335	182,335	182,051	182,051	182,051
R-squared	0.056	0.303	0.336	0.136	0.325	0.354

Source: BLS CPS and O*Net.

Log Hourly Wage_{*t*}: hourly wage, in log-s, at time *t*.

Physical Presence_{*t*}: indicators equal to 1 for occupations that do not require physical presence.

Pandemic_{*t*}: indicator equal to 1 for March and April 2020.

Remote Comm_{*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.

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- Wage gains differ by occupations characteristics, but they did not vary during the pandemic.