

Working remotely and the supply-side impact of Covid-19

Dimitris Papanikolaou
Northwestern University and NBER

Lawrence Schmidt
MIT

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Motivation

- The 2020 pandemic is partly a supply-side shock:
 - ▶ Some sectors of the economy effectively shut down, either due to regulation (lockdowns) or consumer behavior.
- At the same time, the loss of consumer income can lead to demand-side disruptions.
 - ▶ Households increase savings, potentially tilt their consumption basket away from discretionary purchases.
 - ▶ Financial shock as HH default?
- Can we isolate these forces?
 - ▶ **Our take:** Much of the supply-side disruptions related to the inability of workers to perform tasks remotely.

This Paper

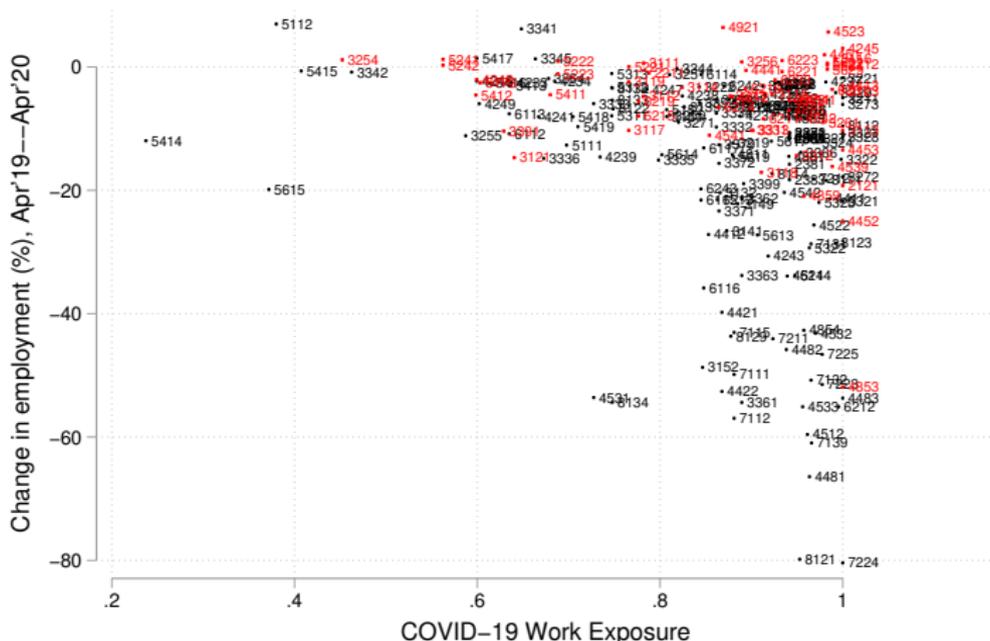
Does ex-ante ability to work from home explain differences in outcomes across industries?

- Asymmetric disruptions across industries
 - ▶ Travel and entertainment services hit very hard
 - ▶ Technology services barely affected
- Large variance in workers' reported ability to telecommute across industries
 - ▶ 3% for transportation and material moving
 - ▶ 78% for computer programmers
- Plan: Construct a "work from home measure" (WFH) and relate to differences in outcomes.

WFH measure

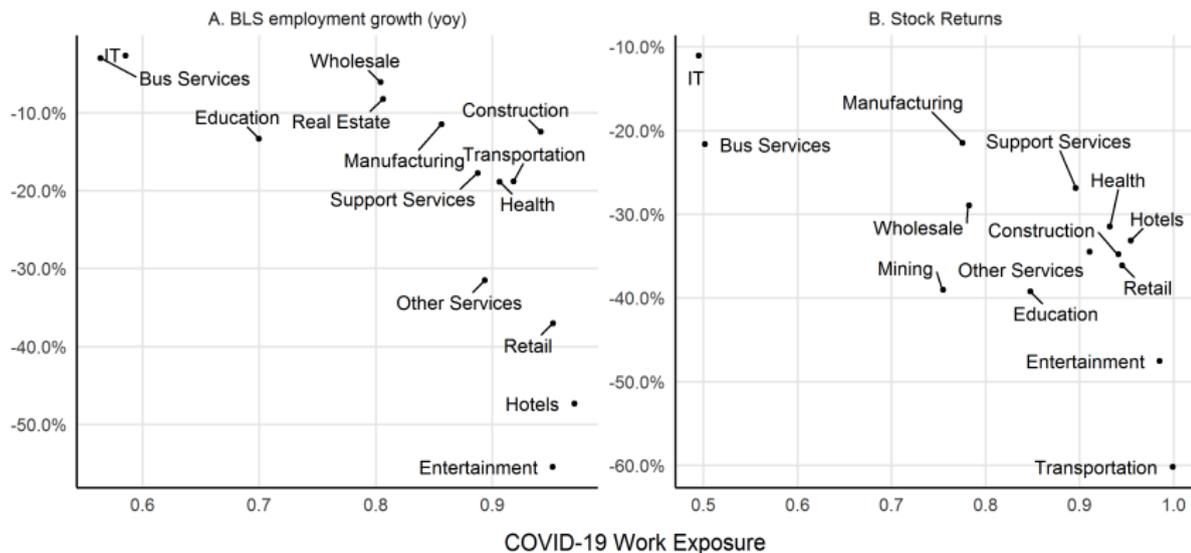
- Covid-19 Work Exposure_{*l*} = 1 - % of workers able to work from home_{*l*}
 - ▶ Data from 2017-2018 ATUS Survey
 - ▶ Worker classified as able to work from home if they report being able to work from home and that they have worked days entirely from home
 - ▶ Mean value of measure is 85%
- Manually set some industries who have been hit very hard to 1
 - ▶ Ability to work from home less relevant if operations are shut down
 - ▶ Ex: Air transportation, Spectator Sports, Amusement Parks, etc...
- Exclude "critical industries" for bulk of analysis
 - ▶ "work from home" not meaningful if business stays open

Employment Growth and Covid-19 work exposure



- The points in **red** correspond to the **critical industries**
- 1 standard deviation change in WFH associated with a 10 percent decline in employment for non-critical industries

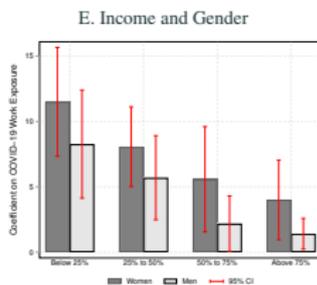
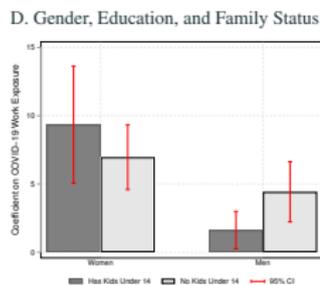
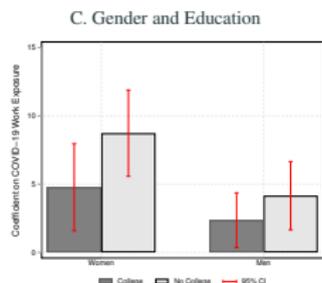
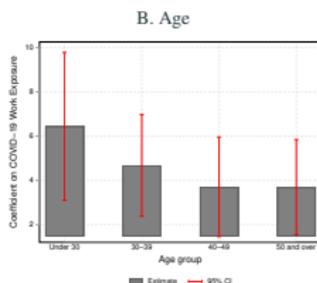
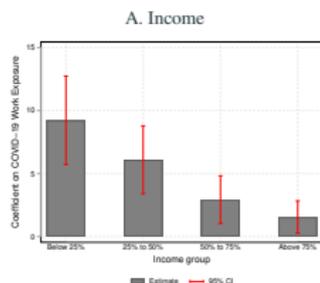
WFH exposure is highly predictive of employment growth and stock returns for non-critical industries



Additional findings in paper: WFH exposure is associated with

- Higher default probabilities and lower analyst revenue growth forecasts
⇒ analysts expect results to persist into 2022
- Larger disruptions and financial distress in survey of small businesses

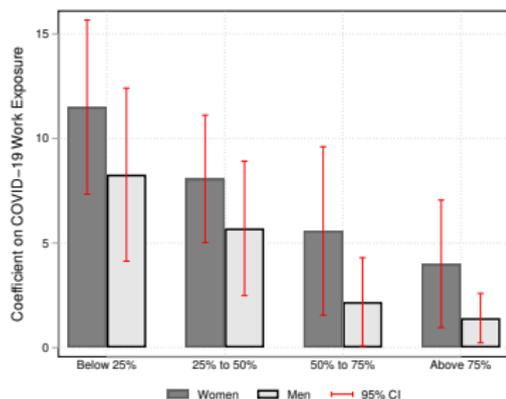
Worker Heterogeneity and Employment Status



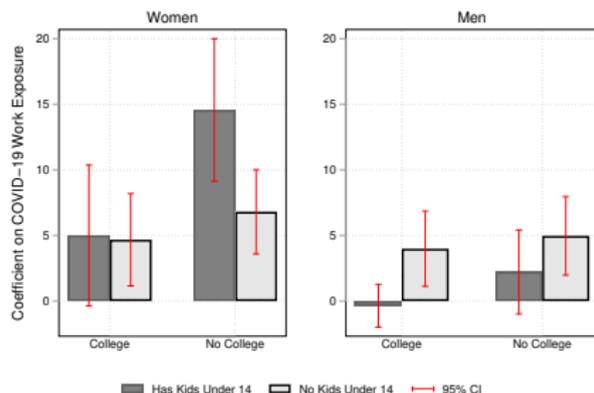
- Plotted: marginal effect of 1 SD change in WFH exposure on probability of being non-employed in April 2020
- Coefficients allowed to vary across groups

Striking gender disparities emerge in link between WFH exposure and likelihood of job loss

E. Income and Gender

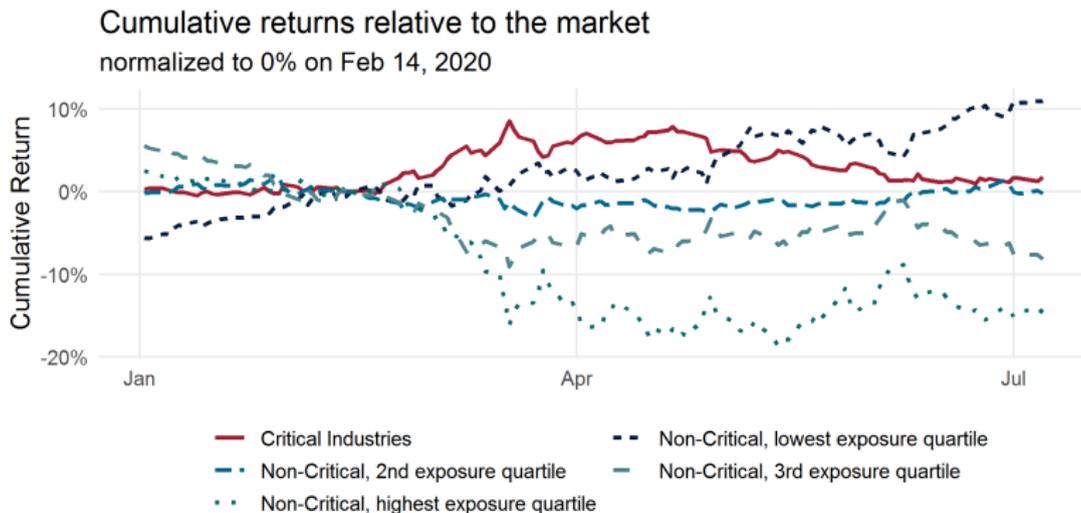


F. Gender, Education, and Family Status



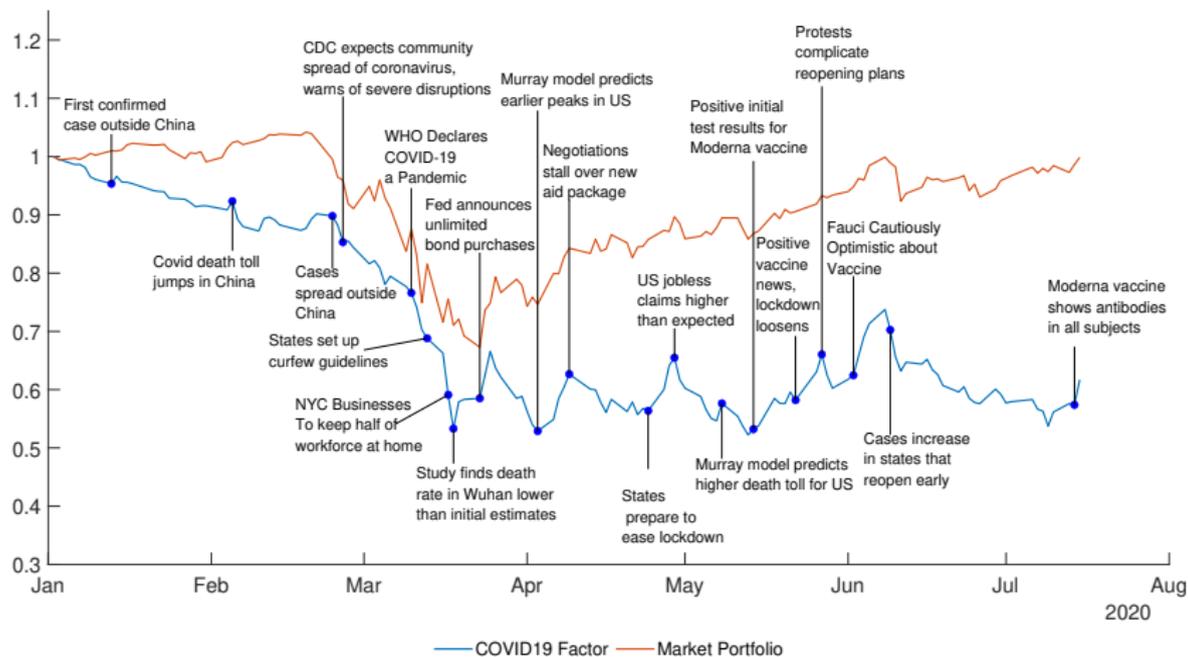
- Exposure is more strongly predictive of job losses for women vs men, especially lower skilled women with children
- Our conjecture: loss of childcare due to remote schooling likely to exacerbate these differences

Most exposed industries had worse stock-market outcomes



- Use Fama-McBeth approach to construct a covid-19 ‘factor’
- Mimicking portfolio overweighs most exposed industries.

COVID-19 factor vs market

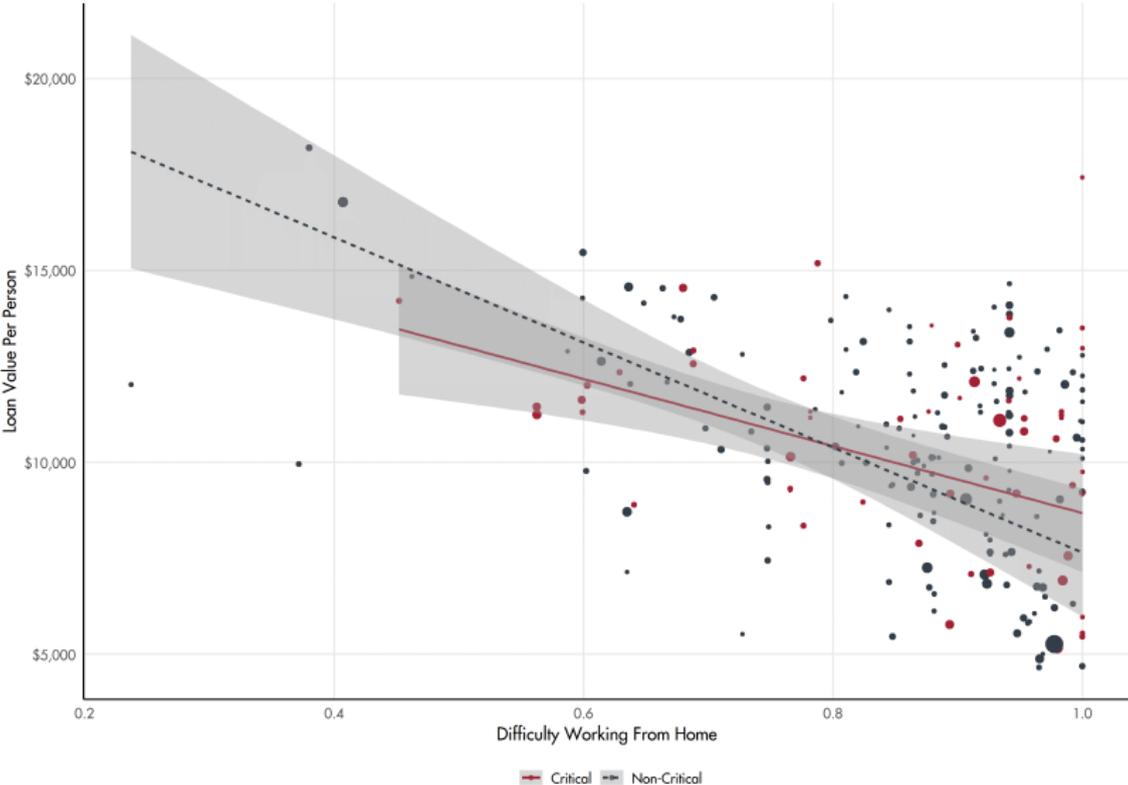


PPP loans went to least exposed firms

- A key component of the 2020 CARES Act was the Paycheck Protection Program (PPP)—a direct subsidy to firms that took the form of forgivable loans.
- However, funds were allocated in proportion to **total payroll expenses**.
 - ▶ Since higher-paid employees are more likely to be able to work remotely, tying financing to payroll expenses had the (unintended) consequence of allocating **more federal funds to the least affected sectors**.

PPP loans went to least exposed firms

Loan Value vs. Difficulty Working from Home
Weighted by Industry Employment

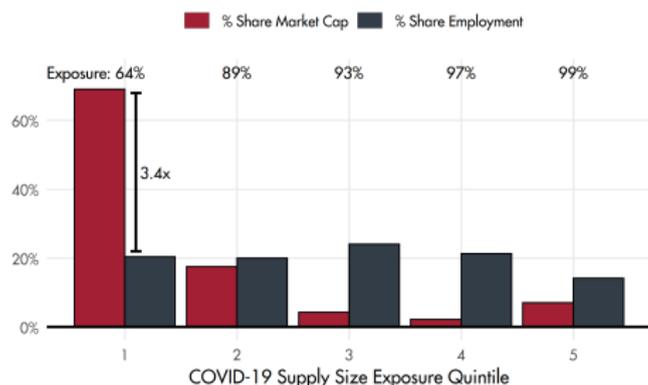


Stock Market vs the Economy

- The 2020 pandemic has affected the overall market index significantly less than the economy.
- Possible explanations include
 1. Low interest rates.
 2. Stock market pricing a strong rebound in the economy.
 3. Stock market is not representative.
- **Our take:** the stock market over-weighs less exposed industries:
 - ▶ Example: Market capitalization share of the tech sector (24%) much higher in relative terms than its employment share (3.5%)

Stock Market vs the Economy

Market Capitalization and Employment by Exposure Quintile



Consider 2 weighting schemes:

1. Red: weight industries based on stock market valuations pre-crisis
2. Black: weight industries based on public + privately held sector employment

Stock returns and revenue changes: employment vs market cap weights

Statistic	Stock Returns (%)	Revenue Forecast Revisions (%)	
		2021	2022
Employment-weighted mean	-14.6	-9.0	-7.2
Market cap-weighted mean	-4.7	-5.9	-4.6
Difference	-9.8	-3.0	-2.6
<i>t</i> statistic	(-3.614)	(-2.022)	(-2.447)

Conclusion

- Strong correlation between supply-side disruptions and industry-level ability of workers to work remotely
- High WFH exposure industries experienced worse outcomes
 - ▶ Greater employment declines
 - ▶ Higher reductions in expected revenue growth
 - ▶ Higher expected likelihood of default
- Least WFH exposed industries received highest dollar amount per employee PPP loans
- Likely policy prescription: target relief payments at most disrupted workers/sectors vs more uniform policies (e.g., stimulus checks for all)