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.
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_t = 1 - % of workers able to work from home_t
  - 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

A. Income

- Below 25%
- 25% to 50%
- 50% to 75%
- Above 75%

B. Age

- Under 25
- 25-35
- 35-49
- 50 and over

C. Gender and Education

- Women
- Men
- College
- No College

D. Gender, Education, and Family Status

- Has Kids Under 14
- No Kids Under 14

E. Income and Gender

- Below 25%
- 25% to 50%
- 50% to 75%
- Above 75%

F. Gender, Education, and Family Status

- Has Kids Under 14
- No Kids Under 14

- Coefficients allowed to vary across groups

- Plotted: marginal effect of 1 SD change in WFH exposure on probability of being non-employed in April 2020
Striking gender disparities emerge in link between WFH exposure and likelihood of job loss

E. Income and Gender

![Graph showing coefficient on COVID-19 work exposure for women and men across different income levels.](image)

F. Gender, Education, and Family Status

![Graph showing coefficient on COVID-19 work exposure for women and men across different education and family status levels.](image)

- 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.
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
• 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

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

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Stock Returns (%)</th>
<th>Revenue Forecast Revisions (%)</th>
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</thead>
<tbody>
<tr>
<td>Employment-weighted mean</td>
<td>-14.6</td>
<td>-9.0</td>
</tr>
<tr>
<td>Market cap-weighted mean</td>
<td>-4.7</td>
<td>-5.9</td>
</tr>
<tr>
<td>Difference</td>
<td>-9.8</td>
<td>-3.0</td>
</tr>
<tr>
<td>t statistic</td>
<td>(-3.614)</td>
<td>(-2.022)</td>
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</tbody>
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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)