Why Working From Home Will Stick

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Over the last 20 years news coverage of WFH was rising by 5% a year

Source: Newsbank Access World News collection of approximately 2000 national and local daily US newspapers. Shows the % of articles mentioning “working from home” or “WFH”. Daily data plotted as a weekly average. Data until January 2020
In the first months of COVID this increased by another 12000%

Source: Newsbank Access World News collection of approximately 2000 national and local daily US newspapers. Shows the % of articles mentioning “working from home” or “WFH”. Daily data plotted as a weekly average. Data until June 2020
Before COVID only 2% of Americans WFH full time

During COVID this surged to over 40% of Americans WFH

Work Status: May 2020 and January 2021

- Working from home: May 2020 (41.9%), January 2021 (35.1%)
- Not working: May 2020 (32.6%), January 2021 (26.4%)
- Working on my business premises: May 2020 (25.6%), January 2021 (38.5%)

Notes: Source Barrero, Bloom and Davis (2020). Shows responses to the question “Currently (this week) what is your work status?”. Data are from two surveys of US residents each aged 20 to 64 who earned more than $20,000 per year in 2019. The monthly surveys covered 2,500 to 5,000 respondents each. Carried out by QuestionPro for Stanford University. Sample reweighted to match the US Current Population Survey.
This has left commercial buildings semi-deserted

Notes: Kastle security index of swipe card access relative to pre-COVID average

https://www.kastle.com
COVID WFH has generated various challenges
A friend told me their husband zooms from the crawl-space
Summary Research Questions

Q1: How much WFH will there be after the pandemic?
A: WFH 5% days (pre-COVID), 60% (during COVID) back to ≈20% (post-COVID)

Q2: What economic mechanisms facilitate a persistent shift towards WFH?
A: Less stigma, experimentation, WFH-enabling investments, lingering concerns about infection risk, and directed innovation

Q3: What are some implications of more WFH post-COVID?
A: Unequal benefits (↑inequality), ↓ cities, ↑ productivity and change time use
Survey and methodology

Current state of WFH

The future of WFH

Why WFH will Stick

Implications
Surveying 27,500 US Workers

Six waves to date (repeated cross sections) via commercial survey provider
- May 2020: 2,500
- July: 2,500
- August: 5,000
- September: 2,500
- October: 2,500
- November 2,500
- December 5,000
- January 2021: 5,000

Randomly sample US residents aged 20-64, earning $20K+ in 2019
- Re-weight to match 2010-2019 CPS by \{earnings \times industry \times state\} cell

Ask 40 questions on:
- Demographics
- Extent of WFH *during* COVID and desires/plans *after* COVID
- Experience, perspectives on WFH etc
Sample Survey Questions

6. After COVID, in 2022 and later, how often is your employer planning for you to work full days at home?
   - Never
   - About once or twice per month
   - 1 day per week
   - 2 days per week
   - 3 days per week
   - 4 days per week
   - 5+ days per week
   - My employer has not discussed this matter with me or announced a policy about it
   - I have no employer

31. Compared to your expectations before COVID (in 2019) how has working from home turned out for you?
   - Hugely better -- I am 20%+ more productive than I expected
   - Substantially better -- I am to 10% to 19% more productive than I expected
   - Better -- I am 1% to 9% more productive than I expected
   - About the same
   - Worse -- I am 1% to 9% less productive than I expected
   - Substantially worse -- I am to 10% to 19% less productive than I expected
   - Hugely worse -- I am 20%+ less productive than I expected
Survey Responses vs. CPS

Earnings

Industry of current (or most recent) job

Census Division

Education

Age

Sex (Share female)
Survey and methodology

Current state of WFH

The future of WFH

Why WFH will Stick

Implications
Huge increase in WFH: about 10x above pre-COVID

Notes: Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, September/October and November 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.

*Pre-COVID estimate taken from the 2017-2018 American Time Use Survey
WFH during COVID concentrated in high-earners and educated

Notes: Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell. Table by demographics
WFH higher in “Blue” states early on, “Red” states later on

May 2020

![Bar Chart showing the percentage of workers working from home, not working, and working on business premises in Blue (Democrat) States and Red (Republican) States for May 2020.]

November 2020

![Bar Chart showing the percentage of workers working from home, not working, and working on business premises in Blue (Democrat) States and Red (Republican) States for November 2020.]

Notes: Source Barrero, Bloom and Davis (2020). Shows responses to the question “Currently (this week) what is your work status?”. Data are from six surveys of US residents each aged 20 to 64 who earned more than $20,000 per year in 2019, collected between May and November 2020. Carried out by QuestionPro for Stanford University. Sample reweighted to match the US Current Population Survey.
Survey and methodology

Current state of WFH

The future of WFH

Why WFH will Stick

Implications
The average employee wants about 2 days WFH a week

Source: Response to the questions: “In 2021+ (after COVID) how often would you like to have paid work days at home?”

Data from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between May 21-25, by QuestionPro on behalf of Stanford University. Sample reweighted to match the US CPS.

*Sample: Respondents who report being able to WFH or did at some point during COVID
Firms are planning ≈2 days a week WFH for those who can

Notes: Data are from the survey waves carried out by QuestionPro and IncQuery with 2,500 to 5000 responses per month. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.

Intensive/extensive margin

*Pre-COVID estimate taken from the 2017-2018 American Time Use Survey
“In all candor, it’s not like being together physically…. [But] I don’t believe that we’ll return to the way we were because we’ve found that there are some things that actually work really well virtually.”

– Tim Cook, CEO of Apple*
Survey and methodology

Current state of working from home

The future of WFH

**Why WFH will Stick**

Implications
1. WFH pre-COVID had a negative stigma ("shirking from home")

Bing image search March 2013


**“Working” Remotely?**

**Selection, Treatment, and the Market Provision of Remote Work**

Natalia Emanuel · Emma Harrington

(Work Market Paper)

This version: November 12, 2020

Latest Version: Click here

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**Abstract**

Why was remote work so rare prior to Covid-19’s lockdown? One possibility is that working remotely reduces productivity. Another is that remote work attracts unobservably less productive workers. In our setting of call-center workers at a Fortune 500 retailer, two natural experiments reveal positive productivity effects of remote work. When Covid-19 closed down the retailer’s on-site call-centers, a difference-in-difference design suggests the transition from on-site to remote work increased the productivity of formerly on-site workers by 9% to 10% relative to their already remote peers. Similarly, when previously on-site workers took up opportunities to go remote in 2018-2019, their productivity rose by 7%. These two natural experiments also reveal negative selection into remote work. While all workers were remote due to Covid-19, those who were hired into remote jobs were 12% less productive than those hired into on-site jobs. Extending remote opportunities to on-site workers similarly attracted less productive workers to on-site jobs. Our model allows us to characterize the counterfactual in which remote workers were not adversely selected. Without adverse selection, the retailer would have hired 37% more remote workers and worker surplus from remote work would have been 32% greater. Given the central role of selection, Covid-19’s effect on remote work will persist if the lockdown disproportionately causes more productive workers to be willing to work remotely.

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1. Less so now it appears
1. Under COVID, survey reports improved WFH stigma

Since the COVID pandemic began, *how have perceptions about working from home (WFH) changed among people you know?*

<table>
<thead>
<tr>
<th>Change in WFH Perceptions Among People You Know</th>
<th>Percent of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved among almost all</td>
<td>22.1</td>
</tr>
<tr>
<td>Improved among most</td>
<td>27.4</td>
</tr>
<tr>
<td>Improved among some</td>
<td>15.2</td>
</tr>
<tr>
<td>No change</td>
<td>28.8</td>
</tr>
<tr>
<td>Worsened among some</td>
<td>3.4</td>
</tr>
<tr>
<td>Worsened among most</td>
<td>2.1</td>
</tr>
<tr>
<td>Worsened among almost all</td>
<td>1.0</td>
</tr>
</tbody>
</table>

*Notes:* Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.
2. Forced experimentation with WFH helps overcome inertia

Before COVID firms primarily operated on business premises, with payoffs distributed according to a known distribution $F$.

Firms could use a second technology, working from home, for a cost, with payoffs distributed $G_\nu$ whose mean $\nu$ is unknown. Firms have a prior over the value of $\nu$.

COVID forces firms to pay to try out working from home ($\approx$2 armed bandit problem)

Working from home sticks due to 2 separate effects:

1. A variance effect: high realized payoffs under $G$ leads WFH to stick for some (i.e., those who got good draws from $G$)

2. A bias effect: experimentation revealed that priors over $\nu$ were too pessimistic, on average, according to our survey data.
2. Forced Experimentation - WFH has exceeded expectations

Relative to expectations, how has WFH turned out?

- Hugely better, 20%+: 19.0%
- Substantially better -- 10 to 20: 21.2%
- Better -- up to 10%: 20.8%
- About the same: 26.2%
- Worse - up to 10%: 6.9%
- Substantially worse - 10 to 20%: 3.1%
- Hugely worse, 20%+: 2.7%

Compared to your expectations before COVID (in 2019) how has working from home turned out for you?

Table by demographics

Notes: Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.
3. Investments (mostly sunk) enabling WFH

Investment in WFH adds to about 1.2% of GDP

How many **hours** have you invested in learning how to work from home effectively (e.g., learning how to use video-conferencing software) and creating a suitable space to work? **Mean hours:** 13.0 (SE = 0.3)

How much **money** have you and your employer invested in equipment or infrastructure to help you work from home effectively -- computers, internet connection, furniture, etc.? **Mean:** $580 (SE = 18)
3. Investments (mostly sunk) enabling WFH

But NIPA data suggest that COVID spurred WFH-enabling investment on business premises, too. Some caution is warranted here, because NIPA data should also capture what firms pay for investments at home in information process equipment and software.
4. Residual Fear of Proximity to Other People…

...and this Residual Fear of Proximity to Other People May Stick

If a COVID vaccine is discovered and made widely available, which of the following would best fit your views on social distancing?

Notes: Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.
One example – patenting of WFH technologies rapidly rising

Summary of Five Mechanisms Why WFH Will Stick

1. Diminished stigma

2. Forced experimentation and positive realizations

3. Investments enabling WFH

4. Majority of people hesitant to fully return to pre-COVID activities

5. Shift in the direction of technical change

Note that network effects will collectively amplify these
Survey and methodology

Current state of working from home

The future of WFH

Why WFH will Stick

Implications
(A) Uneven effects across workers - WFH is a valuable perk

Value of the option to WFH 2 - 3 days/wk, % of current pay?

<table>
<thead>
<tr>
<th>Perception</th>
<th>Percent of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incredibly positive, &gt;30% raise</td>
<td>10.0</td>
</tr>
<tr>
<td>Strongly positive, 15-25% raise</td>
<td>13.0</td>
</tr>
<tr>
<td>Positive, &lt;15% raise</td>
<td>41.0</td>
</tr>
<tr>
<td>Neutral</td>
<td>27.3</td>
</tr>
<tr>
<td>Negative, &lt;15% pay cut</td>
<td>5.6</td>
</tr>
<tr>
<td>Strongly negative, 15-25% pay cut</td>
<td>1.0</td>
</tr>
<tr>
<td>Incredibly negative, &gt;35% pay cut</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Average valuation of 8% matches Mas and Pallais (2017 AER)

Notes: Response to a two-part question.

Part 1: “After COVID, in 2022 and later, how would you feel about working from home 2 or 3 days a week?”
- Positive: I would view it as a benefit or extra pay
- Neutral
- Negative: I would view it as a cost or a pay cut

Part 2: “How much of a pay raise [cut] (as a percent of your current pay) would you value as much as the option to work from home 2 or 3 days a week?”

Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.
(A) Uneven effects – higher paid employees will get to WFH

Notes: Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each \{industry x state x earnings\} cell.

Table by demographics

Note: Marker size is proportional to the number of respondents per income level.
(B) Cities: WFH highest amongst employees from city offices...

Source: Data from a survey of 2,500 US residents aged 20 to 64, earning more than $20,000 per year in 2019 carried out between May 21-25 2020, by QuestionPro on behalf of Stanford University. Sample reweighted to match the US CPS.
(B) Cities - WFH is highest amongst employees from city offices

Notes: Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.
(B) Cities – leading to ≈10% possible spending drops in Manhattan

- Manhattan workers plan to WFH 30.7% working days post-COVID

- Pre-COVID average weekly expenditure near work by these workers $283

- Pre-COVID 2.3M people commuted into Manhattan for work per day

- Implies $10Bn less spending per year
- Fall of about 10% of total spending

Similar calculation for San Francisco
… leading to a donut effect: bad for city centers good for suburbs

**Figure 1.** Normalized Zillow observed rental index broken down by density group and CBD for 12 largest metros by population (Feb 1, 2020 = 100)

(C) Productivity – Bloom, Liang, Roberts and Ying (2014) ran a WFH RCT on a Chinese multinational finding a 13% rise in productivity.

Note: Data from 17806 daily observations on 249 treatment and control employees from January 4th 2010 until August 14th 2011. Number of phone calls made for order-takers (the group for whom number of phone calls taken is a performance metric) calculated separately for treatment (even-numbered birthdays) and control (odd-numbered birthdays). Once employees quit they are dropped from the data. Source: “Does Working from Home Work? Evidence From a Chinese Experiment”, Quarterly Journal of Economics, November 2014.
How does your efficiency working from home during the COVID-19 pandemic compare to your efficiency working on business premises before the pandemic?

Notes: From August to October 2020, we surveyed 7,500 Americans aged 20-64 with labor earnings > $20,000 in 2019. We re-weight raw responses to match the industry-state-earnings shares of working-age persons in the CPS from 2010 to 2019. The right chart also uses responses to questions about employment status (selection), pay levels (for earnings weights) and, for the blue bar, how much their employer plans for them to work from home after the pandemic ends. Source: "Working from Home Will Stick" by Jose Maria Barrero, Nick Bloom and Steven J. Davis, October 2020.
During the COVID-19 pandemic, while you have been working from home, how are you now spending the time you have saved by not commuting?

Please assign a percentage to each activity (the total should add to 100%).

Table by demographics

Notes: Data are from four survey waves carried out by QuestionPro and IncQuery in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. We re-weight raw responses to match the share of working age respondents in the 2010-2019 CPS in each {industry x state x earnings} cell.
Conclusion

WFH days 5% pre-COVID, 60% during COVID, predicting 22% post-COVID

Mechanisms behind a persistent WFH shift
1. Diminished stigma
2. Positive productivity experiences
3. Investments enabling WFH
4. Lingering concerns over density
5. Re-directed innovation

Implications for
• Rising inequality
• Cities vs. suburbs
• Higher Productivity
• Freed Commute Time
Back-Up
### Summary Statistics

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>p25</th>
<th>p50</th>
<th>p75</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earnings, $'000s</td>
<td>58.1</td>
<td>53.9</td>
<td>35</td>
<td>45</td>
<td>65</td>
<td>11,524</td>
</tr>
<tr>
<td>Age</td>
<td>40.4</td>
<td>11.7</td>
<td>35</td>
<td>35</td>
<td>45</td>
<td>11,524</td>
</tr>
<tr>
<td>Years of education</td>
<td>15.0</td>
<td>2.1</td>
<td>14</td>
<td>16</td>
<td>16</td>
<td>11,524</td>
</tr>
<tr>
<td>100*1(Ever WFH during COVID?)</td>
<td>56.6</td>
<td>49.6</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>6,484</td>
</tr>
<tr>
<td>100*1(Currently WFH during COVID)</td>
<td>36.2</td>
<td>48.1</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>11,524</td>
</tr>
<tr>
<td>Percent pre-COVID WFH days</td>
<td>16.2</td>
<td>32.0</td>
<td>0</td>
<td>0</td>
<td>20</td>
<td>9,361</td>
</tr>
<tr>
<td>Percent desired post-COVID WFH days</td>
<td>44.4</td>
<td>40.2</td>
<td>0</td>
<td>40</td>
<td>100</td>
<td>11,524</td>
</tr>
<tr>
<td>Percent employer planned post-COVID WFH days</td>
<td>23.1</td>
<td>35.8</td>
<td>0</td>
<td>0</td>
<td>40</td>
<td>7,856</td>
</tr>
<tr>
<td>Commute time pre-COVID (minutes)</td>
<td>27.8</td>
<td>26.5</td>
<td>10</td>
<td>20</td>
<td>35</td>
<td>11,517</td>
</tr>
<tr>
<td>Percent raise equal to option to WFH 2-3 days/week</td>
<td>7.1</td>
<td>12.0</td>
<td>0</td>
<td>5</td>
<td>13</td>
<td>10,150</td>
</tr>
<tr>
<td>How much more productive than expected has WFH been?</td>
<td>7.1</td>
<td>12.3</td>
<td>0</td>
<td>5</td>
<td>15</td>
<td>4,397</td>
</tr>
<tr>
<td>Can you do your job from home (0 to 100 % scale)</td>
<td>74.5</td>
<td>58.8</td>
<td>7</td>
<td>85</td>
<td>100</td>
<td>5,040</td>
</tr>
<tr>
<td>Percent higher effectiveness WFH during COVID over business premises pre-COVID</td>
<td>4.1</td>
<td>16.5</td>
<td>0</td>
<td>0</td>
<td>13</td>
<td>4,812</td>
</tr>
<tr>
<td>Investments in infrastructure, equipment for WFH by employer or self, $</td>
<td>580.0</td>
<td>1233.7</td>
<td>0</td>
<td>50</td>
<td>500</td>
<td>4,789</td>
</tr>
<tr>
<td>Hours invested learning to WFH effectively</td>
<td>13.0</td>
<td>20.7</td>
<td>2</td>
<td>6</td>
<td>18</td>
<td>4,805</td>
</tr>
<tr>
<td>Weekly spending near work, $</td>
<td>156.4</td>
<td>168.9</td>
<td>37</td>
<td>100</td>
<td>210</td>
<td>7,934</td>
</tr>
<tr>
<td>100 x 1(Female)</td>
<td>59.9</td>
<td>49.0</td>
<td>0</td>
<td>100</td>
<td>100</td>
<td>11,524</td>
</tr>
<tr>
<td>100 x 1(Red State)</td>
<td>42.8</td>
<td>49.5</td>
<td>0</td>
<td>0</td>
<td>100</td>
<td>11,524</td>
</tr>
</tbody>
</table>

**Notes:** Summary statistics for key variables, re-weighted to match the share of people in the 2010-2019 CPS in each {industry x state x earnings} cell. Data are from four survey waves in May, July, August, and September/October 2020 with 2,500 responses in the first two and the last, plus 5,000 in August. Not all questions (and hence not all variables) appear in all waves. Number of observations is less than the 12,500 survey responses primarily due to dropping responses that took less than 3 minutes to respond.
Worries about negative long-run impact on employees

One month in:
- Hey man, where ya been?
- Haven't seen you around.
- Oh, I started working at home about a month ago. Been sorta cooped up.

Six months in:
- Hey man, where ya been?
- Haven't seen you around.
- Home work at. Not go out much. Daylight not see. English is speak becoming hardness.

One year in:
- Hey man, where ya been?
- Haven't seen you around.
- HOOBAPORKRENDE!
- CHOPPY HURR HAYHAYA
- PEEPEENESS!
- I PEEPEE NOW!
- AHHHHH!
WFH Looks Similar to 10 Year Ago (no radical technological changes)

WFH in 2010: Jet Blue (SLC)  

WFH in 2010: Ctrip (Shanghai)