Part I: Related Research


Part II: News Articles


Barrero, J., Bloom, N. and Davis, S. “Let me work from home, or I will find another job,” CEPR VOXEU, July 2021. https://cepr.org/voxeu/columns/let-me-work-home-or-i-will-find-another-job

Clark, P. “Empty offices on Mondays and Fridays spell trouble,” The Financial Times, May 2021. https://www.ft.com/content/cfa740a3-2a60-4f11-aadc-95feed1e5a8c

Part III: Summary of Questions

Expert Q&A:

1. The impact of working from home seems to be multi-fold: on cities, firms, employees, and transportation. City-wise, we see that bigger cities have higher rates of working from home, which has many mayors struggling to attract people back to downtowns and office districts. But people also now go to cities for different reasons: Boston’s Newbury Street (a popular shopping district), for example, is booming compared to its Financial District. What do you think is the impact on the future of cities?

   Answer: People moving out of city centers may be a good thing, it’s not immediately obvious that we want our cities to be as dense as 2019. Since the 1980’s, we have seen city centers become more and more dense, and more expensive. Having less people in large cities may actually help our current affordability crisis. However, it also redistributes tax revenues to the suburbs due to the donut effect. In terms of public transportation, transit agencies may need more fiscal support in the absence of commuters. Perhaps suburbs need to contribute more funding from their increased tax revenues if the region wants to see more commutes to the downtown core.

2. Firm-wise, we see data on a short-term productivity increase of 3-5%, but anticipate a long term impact on the “intangibles” of spontaneity and creativity that emerge from being in different spaces. We may not observe the latter until a couple years down the road. How are you noticing firms responding to this?

   Answer: Fully remote work is more problematic for the “intangibles” compared to hybrid work. Tech campuses for example realize the advantages the global hiring and no office space could provide if they were to operate fully remotely, but have also noted the lack of creativity. Indeed there is a lot of literature indicating that it is harder to innovate when you are remote. Studies at some companies have shown that employees who worked from home two to three days a week wrote 8% more lines of production code compared to fully in-person employees. Hybrid is a win-win situation if it is well organized.

3. Employee-wise, we see there is some tension between employee preferences and employer preferences. How do you see this tension evolving over time, and how do corporations mitigate this?
Would an upcoming recession, where leverage would move from employees to employers, have any effects on the amount of remote work?

Answer: Companies have realized that hybrid works for many people. For college graduates, employer and employee preferences have somewhat become more aligned on average compared to pre-pandemic, at 2-3 days a week. The gap in expectations occurs for non-college grads, who may be working more service-oriented jobs. A recession may not have a big effect on this, since the reasons and preferences for flexible work are not cyclical (happiness, productivity, supporting DEI, and saving space), but it may have some impact in the form of a “nike swoosh”. Maybe it will decrease from 30% to 25%, but in the long run, a lot of R&D is being put into technologies to improve remote working, and we see a much larger adoption of working from home going forward.

4. Over the course of your work, what observations surprised you? What surprised others but not you?

Answer: I was surprised that it works so well. A lot of people were very skeptical about the productivity of remote or hybrid work when it started, but that view has completely changed 2 years in because workers have proven they can be efficient. This is a permanently shifted equilibrium. Cloud technologies that have emerged in the last 6 to 7 years have likely been the largest enablers of this success.

Audience Q&A:

1. Is there any way to predict the optimal mix of in-person vs remote work may be by job category?

Answer: There is a dictionary of occupational terminology which catalogs all jobs and activities. From the nature of the activities, one could figure out what is in-person and what is remote. This can predict the share of remote work quite accurately.

2. Are there any further reflections on the higher rates of remote work in larger cities and the implications for commuting and transportation?

Answer: Density does bring much higher rates of remote work for sure. Using regressions, we had an extremely steep correlation with density which we were able to half when controlling for education and the likes, but the resulting slope was still very steep, indicating that other factors have to be at play. Commuting may be one of them.

3. We see that somehow, even with remote or hybrid work, people have a transport budget, and are willing to spend a certain percentage of time traveling, if not commuting, for other purposes. What do you think about the environmental impacts of this, or remote work in general?

Answer: You could think of traveling as an elasticity, and this particular trend is a huge issue for environmental impact. In addition, even though people are commuting less, they are commuting further and increasingly living in the suburbs which are less energy-efficient than in cities. Employees are also air-conditioning and heating their homes while employers still heat/cool their offices, which has a very large environmental impact.
4. Do you have any thoughts on how cities may change less land use regulations to be more attractive or anticipatory of future trends?

Answer: There will be less demand for office space, particularly low-grade office space, and less spending on coffee and lunch during the workday. Some of this existing retail and office space could potentially be converted into residential units, but that is an uphill task to retrofit due to the number of restrooms, elevators, windows, and such required of a home.

5. Do you see any evidence on the “great resignation” leading to firms hiring more workers in another city or location?

Answer: At Stanford, there has definitely been more remote hires across the US after the pandemic. Call centers and HR, for example, could move out to lower cost of living areas. This is a good thing because it will redistribute jobs away from expensive cities like San Francisco and Boston, and help rejuvenate cities in the middle of the country.

Part IV: Summary of Memos

McKenzie Human was interested in the dynamic between the emerging hybrid work structure, the housing market, energy use, and land use. She anticipates that the movement of higher-paid workers might interplay with other ongoing urban trends such as housing affordability and efforts to increase transit usage and reduce driving, however, the redistribution of land use patterns throughout cities could counteract some of these effects.

David Hong was interested in what can be done from a real estate perspective to reconfigure office layouts and better anticipate the needs of shifting worker behavior in the future of work, such that their time spent in the office feels more valuable. Such examples, as mentioned in the talk, could include reconfiguring more meeting rooms and spaces compared to personal cubicles currently. David was also interested in determining who exactly is benefitting from shifts in residential real estate markets.

Michael Leong was most interested in the mobility implications of the “nike swoosh” adoption of remote working technologies, and how that may completely change the nature of commute-based travel patterns. He notes that presently, traffic engineers still observe some resemblance of structured peak commutes in the morning and afternoon, although the morning volume has shrunk in many places, and the afternoon peak travel time has expanded. With higher flexible work adoption rates, this structure may become even less pronounced or completely disappear, necessitating a complete rethinking of how we plan, operate, and govern transportation systems.

Manasa Acharya was interested in the long-term impacts of the “donut effect” which emerged from current hybrid work arrangements, and the effects on urban density, public transit usage, and social interaction. She suggests that perhaps alternate spaces to create intermingling and shared experiences amongst diverse groups of people could be created if that happens less in the workplace.
Jason Luo was also interested in the long-term impacts of the “donut effect” from the view of mobility and disease spread implications from decreased density of cities. He postulates that less clustering of commuting patterns around urban centers could lead to a net positive benefit for commuters overall, and lesser density would lessen the ability of diseases to spread in future pandemics. This could provide positive macroeconomic effects and increase resiliency of the economy.

John Gibbons was interested in how the divide between flexibility afforded to college-educated and non-college educated workers would impact the income gap between the two, as well as the impacts to the loss of business from workers in downtown districts. He notices that while more amenities such as cafes may appear in suburban centers, workers may have longer commute times to get to such amenities.

Samuel Chin was interested in the valuations of pay increases and productivity increases from hybrid and remote work. He notes that trends such as reported higher concentration at home may not apply to the entire population, as those with families, pets, or without well-separated office arrangements. These difficulties may cause some to prefer working in the office or at third places, and as such there are limitations of generalizing the best reasons for the perceived benefits of working from home. He also notes that full employee choice is also not an optimal solution, as a lack of coordination could lead to less employee interaction, defeating the purpose of working in-person.

Ao Qu was interested in the intersections between the future of work and automated vehicles and the human-centered city. He notes that commutes may become less costly in the future with the introduction of automated vehicles, and the less office-centric downtown is a chance to recreate the space to bring more pedestrian-centricity to the city. He sees the potential for these two trends to create win-win situations for the future of work, cities, and people.

Spencer McDonald was interested in how the difference in the 60% work-from-home adoption at the height of the pandemic and the current 30% adoption rate shows how different employers and employees adapted to remote working differently. This emphasizes that although Nick Bloom alluded to a hybrid workplace working it is implemented the “right” way, actual implementations, preferences, and attitudes vary greatly.

Paul Twijukye was interested in the benefits of hybrid and remote work for employees and employers from a recruitment, retention, and onboarding perspective. He notes that increasing levels of remote work could allow cross-sourcing talent from less expensive geographical locations, allowing for a larger talent pool and possibly more diverse hires. He also notes that remote work can be especially challenging from newcomers building relationships with fellow co-workers, emphasizing the need for effective imposition of a hybrid work model.

Yen-Chu Wu was interested in the dynamics of energy usage from workplaces, commutes and transit, homes, and third places, and what this means for decarbonizing mobility and buildings at large, recognizing the issues of double-climate control at the home and office and increased proportions of single-occupancy vehicle commuting presented in the talk. She postulates that public transportation could be improved to take advantage of new commuting patterns, and how land use can be changed to create, for example, transit-oriented third places.
Tushar Kanade found the variation of remote and flexible work rates by industry and country especially interesting, relating these to the distinction between the generally well-accepted benefits of remote working (happiness and DEI) and the more subjective ones (productivity and space efficiency). He questions what it will take for hybrid and remote work to be adopted more quickly by sectors other than tech, and the implications for urban growth at large, especially on the expansion of the city boundary. This underscores the importance of interdisciplinary as well as discipline-specific research by industry in the future.

**Part V: Reflection**

This talk by Nicholas Bloom was a rare insight into the dominant driving force reshaping the future of cities and transportation in real time, with broad applications to transportation and urban policy. Since cities and transportation are issues which exist primarily because of economic development, having insights into trends in the work of the future enables planners to anticipate future needs and demands on urban systems.

Increasingly, transportation and city planning of the future also needs to become more anticipatory and less responsive. The responsive nature of transportation planning is exhibited in the present-day scenario where public transportation systems were unable to instantly adapt to the emerging demands of the future of work, and instead still operate based on pre-pandemic schedules. This is in contrast to automobile commutes, which were more flexible to worker’s preferences. Anticipating the future of work will allow transportation and city planners to plan their systems in order to enable the sustainable adoption of economic ideals, instead of being stuck in a “response mode” to future changes. Hopefully, the concerns of the transportation industry which aired in the Q&A and comments, including sustainability of travel, urban form, technology adoption, equity, and energy usage can also help inform future work on the economic and societal impact of hybrid work policies.

Planners and engineers will greatly benefit from the quantitative data from the national Survey of Working Attitudes and Arrangements and segmentation of trends by industry, gender, and education. Using the representative survey of working trends can ensure that policies or infrastructure developments are based on collective, representative experiences. The applicability of this survey data is most suited to national-level studies on aggregate travel patterns and energy consumption, or cross-comparison across cities and metro areas. However, the survey design for the entire US can limit its usefulness in developing policies on an individual city level. A more granular survey which captures trends at neighborhood levels may be of more use to planners on a local level deciding development or transportation policy.

Overall, participants enjoyed the talk and remained actively engaged in the chat throughout the presentation. The presentation style was very information-rich and thought provoking, as well as easily interpretable by a diverse audience. The MIT Mobility Forum greatly appreciated Nicholas Bloom’s presentation and looks forward to his continued research on the future of working from home.
Background and Data on Working From Home

- Research on WFH starting in 2004
- Currently monthly surveys of 5,000 US working age adults and 1,000 US firms
- Quarterly surveys of 20,000 working age adults across 22 countries
- Discussions and consulting with 100s of organizations globally
Going to cover three sections

>>>>> Current state of working from home

>>>>> Thoughts on managing hybrid-WFH

>>>>> Impact on offices and real-estate
WFH is sticking: from 5% (pre-COVID) to ≈30% (post-COVID) of days

US full days worked from home, %

WFH days doubling every 12 years pre-pandemic

The 6-fold increase over the pandemic equal to 50 years of pre-pandemic growth

Source: Data from 75,345 survey responses May 20 to Feb 22 weighted to match the US population. Pre-covid data from the American Time Use Survey. Post-COVID from 4,759 Feb 2022 responses from Survey of Workplace Attitudes and Arrangements (Barrero, Bloom and Davis 2021). Details on https://wfhresearch.com/
Post COVID employees will split into three groups

### Planned Post-COVID Working Arrangements

<table>
<thead>
<tr>
<th>Arrangement</th>
<th>Percent of employed respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully on site</td>
<td>55.6</td>
</tr>
<tr>
<td>Hybrid</td>
<td>29.0</td>
</tr>
<tr>
<td>Full WFH</td>
<td>15.4</td>
</tr>
</tbody>
</table>

**Front-line employees, mostly non-graduates, lower paid,**

**Professionals and managers, mostly graduates, higher paid,**

**Specialized roles - IT support, payroll etc, often contractors**

**Source:** Data from 16,575 US SWAA responses in August through December 2021, reweighted to match the US population. Details on https://wfhresearch.com/
US, Canada and Europe similar levels of WFH. Asia & Australia less

Workplace Trips
Google cellphone workplace mobility in % deviation from Jan 2020

Source: Data from Google Workplace Cellphone Mobility Data
https://www.google.com/covid19/mobility/
Four benefits of Hybrid-WFH explain why this is becoming dominant

1. Employees are happier

2. Productivity is increased (if well organized)

3. Supports diversity, equity and inclusion

4. Saves space (maybe)
Happier: Employees value hybrid-WFH as about an 8% pay increase

Value of WFH 2-3 days a week, % current pay

Technology
Finance
Business Services
Retail Trade
Education
Health Care
Government
Manufacturing

Source: Data from 17,087 responses through 2021, reweighted to match US population. Industries with 1000+ respondents. Details on https://wfhresearch.com/
Note, most employees do not want to WFH every day

Responses to the question: As the pandemic ends, how often would you like to have paid workdays at home?
Sample: Data are from the April to June 2022 SWAA waves from www.wfhresearch.com. The sample includes respondents who have work-from-home experience during the pandemic and pass the attention-check questions. We re-weight the sample of US residents aged 20 to 64 earning $10,000 or more in 2019 or 2021 to match Current Population Survey on age, sex, education, and earnings. N = 8,788 (both figures)
Productivity: RCTs, natural experiments and survey research suggests a small productivity boost from WFH of around 3% to 5%

Source: Data from 42,240 US responses in through 2021, reweighted to match the US population. Details on https://wfhresearch.com/
The two drivers of higher productivity are quiet at home (better for concentration “deep” work) and time from saved commuting.

How did you use the commuting time you saved by working from home, percent

- Working more on my job: 40.7%
- Indoor leisure (TV, games etc): 19.7%
- Outdoor leisure or exercise: 13.5%
- Chores and home improvements: 16.2%
- Childcare: 9.9%

Source: Data from 32,461 respondees who can work from home, reweighted to match the US population. Details on https://wfhresearch.com/
Diversity: Data suggests Hybrid-WFH can help support diversity in various dimensions (race, gender, age and religion)

Source: Data from 10,000 US responses in through 2021, reweighted to match the US population. Details on https://wfresearch.com/

Space saving: So far not that much….. I’ll come back to this later…
WFH is highest in tech - the only sector with large fully remote firms

Current WFH: all wage and salary employees by industry

<table>
<thead>
<tr>
<th>Industry</th>
<th>Days per week</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information (incl. part of tech)</td>
<td>2.72</td>
</tr>
<tr>
<td>Finance &amp; Insurance</td>
<td>2.18</td>
</tr>
<tr>
<td>Professional &amp; Business Services</td>
<td>1.98</td>
</tr>
<tr>
<td>Arts &amp; Entertainment</td>
<td>1.95</td>
</tr>
<tr>
<td>Real Estate</td>
<td>1.84</td>
</tr>
<tr>
<td>Wholesale Trade</td>
<td>1.69</td>
</tr>
<tr>
<td>Government</td>
<td>1.53</td>
</tr>
<tr>
<td>Construction</td>
<td>1.51</td>
</tr>
<tr>
<td>Utilities</td>
<td>1.42</td>
</tr>
<tr>
<td>Health Care &amp; Social Assistance</td>
<td>1.33</td>
</tr>
<tr>
<td>Education</td>
<td>1.31</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>0.94</td>
</tr>
<tr>
<td>Retail Trade</td>
<td>0.77</td>
</tr>
<tr>
<td>Other Personal Services</td>
<td>0.65</td>
</tr>
<tr>
<td>Hospitality &amp; Food Services</td>
<td>0.58</td>
</tr>
<tr>
<td>Transportation and Warehousing</td>
<td>0.57</td>
</tr>
</tbody>
</table>

Notes: Survey of Workplace Attitudes and Arrangements www.wfhresearch.com Sample N=13,662 from April to July 2022
WFH is highly concentrated in bigger cities

Source: 66,815 survey responses Jan 21 to Aug 22 weighted to match the US population. Details on https://wfhresearch.com/
Going to cover three sections

>>>>> Current state of working from home

>>>>> Current state of managing hybrid-WFH

>>>>> Impact on offices and real-estate
The Big Challenge of Hybrid WFH for Management

Choice of:

- How many days
- Which days
I have become concerned with the risks of full employee choice.
The reason is the key benefit of office time is being with colleagues

What are the top 3 benefits of working on your employer's business premises?

- Face-to-face collaboration: 54.8%
- Work/personal life boundaries: 54.0%
- Socializing: 44.4%
- Better equipment: 39.2%
- Face time w/ manager: 30.6%
- Quiet: 15.5%

Employees commute for 1 hour to work to be with colleagues – not for the free bagels.

Notes: The sample includes respondents to the February 2022 SWAA who passed the attention check questions and worked from home at some point since the start of the COVID-19 pandemic. The SWAA samples US residents aged 20 to 64 who earned $10,000 or more in 2019. N = 2,973.
Large US firms mostly planning team or company organized hybrid

Qu: \textit{“Who decides which days and how many days employees work remotely?”}

Source: Survey of Business Uncertainty conducted by the Federal Reserve Bank of Atlanta, Stanford University, and the University of Chicago Booth School of Business.
If you pick WFH days I would suggest Monday and Friday

Busiest office days

Based on bookings from Jan - Jun 2022. Source: kadence.co
So, how Leaders Can Make the Most of Hybrid WFH

1) Coordinate your team to come in on the same 2 or 3 days every week (e.g. T and Th)

2) Promote in person meetings, events, coffee, training, lunches on those office days

3) Suggest cross-office zoom meetings and reading, writing, data etc on home days

4) For new hires (< 1 or 2 years) add an extra day in the office for mentoring

In short, set a culture and organize to achieve this of office time = group social time
Going to cover three sections

>>>>> Current state of working from home

>>>>> Current state of managing hybrid-WFH

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Implications of hybrid WFH for the Office and Cities

1) Size

2) Location

3) Design

4) Support services
1) Firms are **currently** not planning to cut office space too much....

**US Data**

- Office
- Retail
- Factory
- Other

**UK Data**

- Office space
- Retail space
- Factory space
- Other space
- Storage space


2) Location: some **people** have left city centers (e.g. NY and SF)

Cumulative net flows (moves in – moves out) from Feb 2020-Jul 2021 as a % of the zipcode population

But offices are mostly not moving: firms are focusing on quality space.

Under hybrid-WFH the idea is to have employees come in the same two or three days each week. To do this offices need to be convenient and high quality.
3) Design - firms say they are putting in zoom rooms, more meeting rooms and lounge seating, plus safety (air-filtration, cleaning etc)

Individual office corridors are out

Cubicles, meeting rooms and open plan (lounge) seating are in
4) Support services - WFH will increase outsourcing/offshoring of things like IT support, payroll, benefits etc (freeing up some space)

The Pandemic spike in WFH will lead to a surge of service sector globalization in 2020s & 2030s
Further information:

Twitter @I_am_nickbloom

www.wfhresearch.com

WORKING FROM HOME BEFORE AND SINCE THE START OF COVID

To sign up for monthly results updates please click here.
Download our time series data on the extent of working from home.
Back-Up
Pandemic has also seen a start-up surge, partly from WFH

Source: US Census Bureau. Business Applications (BA) that have a high-propensity of turning into businesses with payroll. The identification of high-propensity applications is based on the characteristics of applications revealed on the IRS Form SS-4 that are associated with a high rate of business formation. High-propensity applications include applications: (a) from a corporate entity, (b) that indicate they are hiring employees, purchasing a business or changing organizational type, (c) that provide a first wages-paid date (planned wages); or (d) that have a NAICS industry code in manufacturing (31-33), retail stores (44), health care (62), or restaurants/food service (72).

https://fred.stlouisfed.org/series/BAHBATOTALSAUS
Personal grooming is 28 minutes average when commuting to work, 19 minutes for WFH (with this split out by genders below)

Source: Data from 3,997 respondees who can work from home in January 2022, reweighted to match the US population. Details on https://wfhresearch.com/
WFH employees save 9 minutes a day on less personal grooming

Percent who shower or bathe when:

<table>
<thead>
<tr>
<th></th>
<th>Going into work</th>
<th>Work from home</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFH</td>
<td>85.1%</td>
<td>73.4%</td>
</tr>
</tbody>
</table>

Percent who wear fresh clothes when:

<table>
<thead>
<tr>
<th></th>
<th>Going into work</th>
<th>Work from home</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFH</td>
<td>93.7%</td>
<td>71.5%</td>
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</table>

Percent who brush their teeth when:

<table>
<thead>
<tr>
<th></th>
<th>Going into work</th>
<th>Work from home</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFH</td>
<td>95.3%</td>
<td>91.8%</td>
</tr>
</tbody>
</table>

Percent who shave when:

<table>
<thead>
<tr>
<th></th>
<th>Going into work</th>
<th>Work from home</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFH</td>
<td>52.4%</td>
<td>39.6%</td>
</tr>
</tbody>
</table>

Percent who put on makeup when:

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<thead>
<tr>
<th></th>
<th>Going into work</th>
<th>Work from home</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFH</td>
<td>44.4%</td>
<td>27.9%</td>
</tr>
</tbody>
</table>

Percent who use deodorant when:

<table>
<thead>
<tr>
<th></th>
<th>Going into work</th>
<th>Work from home</th>
</tr>
</thead>
<tbody>
<tr>
<td>WFH</td>
<td>92.9%</td>
<td>81.6%</td>
</tr>
</tbody>
</table>

Source: Data from 3,997 respondees who can work from home in January 2022, reweighted to match the US population. Details on https://wfhresearch.com/