The Remote Work Revolution: Implications For Productivity, Real Estate Values, and the Urban Environment

NY Fed Future of Productivity Workshop

Stijn Van Nieuwerburgh

Columbia Business School

February 16, 2024
Remote Work Revolution

“Work is no longer a place you go. It’s something you do.”

Slack CEO and Co-Founder Stewart Butterfield
Work From Home

- Across U.S., about 30% of days are WFH, flat
- Five-fold increase over pre-pandemic

Note: SWWA, Barrero, Bloom, and Davis (2021)

For longer-term perspective: Census/ACS, NLSY, ATUS
In Person Office Visits

- Turnstile data at 53% of pre-covid levels on Jan 31, 2024 (51% NYC, 47% SF)
- Confirmed by other sources: By day, Placer AI, Survey NYC, REBNY

Note: Kastle Workplace Barometer
Office Utilization Rate

- Around 30% in U.S.; peak utilization at 45%

Note: XY Sense – based on sensor data
Reduction in Space Demand by Firm Size

Past 4 years (2020-2023)

- 83% of large firms (> 12 mi sf) have cut office space; 50% by 10-30%, 13% by more than 30%
- 67% of medium firms (3-12 mi sf) have cut office space
- 53% of small firms (<3 mi sf) have cut office space
Reduction in Space Demand by Firm Size

Next 3 years (2024-2026)
- 74% of large firms plan to cut; 38% by more than 30%
- 73% of medium firms plan to cut; 40% by more than 30%
- 54% of small firms plan to cut; 45% by more than 30%

How has the portfolio changed since January 2020?

How do you expect the portfolio size to change over the next three years?

Optimizing Real Estate Portfolio

- Hot-desking/hotelling, office neighborhoods, AirBnB for office
Alternative Work Seats

Traditional Capacity 117
(= focus seats)
Focus Seats 117
Alternative Seats 311
  Collaborative Seats 198
  Amenity Seats 116
New Capacity 274
(= focus seats + 50% of alternative seats)*
Focus Seats 117
Alternative Seats 311
  Collaborative Seats 198
  Amenity Seats 116

* Percent of alternative seats to include in capacity will vary by Workplace strategy.
Source: CBRE Workplace & Occupancy Management and CBRE Design Collective, 2023
New Hybrid Work Styles

**The Boulevard (Focus-Based)**
Individual seats are homogeneous and assigned. Circulation is streamlined for maximum efficiency, with one major thoroughfare connecting curated collision points.

**The District (Activity-Based)**
Desks are shared and employees are empowered to organize where and how they want to work. Neighborhoods include support functions and a variety of meeting spaces.

**The Plaza (Event-Based)**
A divergent model that allows teams to select and customize their neighborhoods, maximizing flexibility and mobility. Higher proportion of collaboration space.

**The Park (Collaboration-Based)**
Companies with the most employees working entirely from home will need a community hub to promote connectivity and culture, mostly used for trainings and other events.

Hybrid Work is Dominant Mode of Work

- 84% of firms allow 2 or more days per week remote, 100% of large firms
- Only 6% are full-time in office

Why Employers Support Hybrid Work

![Bar Chart]

- **Talent attraction/retention**
- **Collaboration/innovation**
- **Cost avoidance**
- **Portfolio optimization**

# Employers Prioritize Productivity

**What are your top priorities and investments for your office(s)?**

*Respondents selected multiple options to represent their experience*

<table>
<thead>
<tr>
<th></th>
<th>North America</th>
<th>Europe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increasing productivity</td>
<td>77%</td>
<td>63%</td>
</tr>
<tr>
<td>Increasing collaboration</td>
<td>61%</td>
<td>64%</td>
</tr>
<tr>
<td>Creating/maintaining company culture</td>
<td>51%</td>
<td>49%</td>
</tr>
<tr>
<td>Safety and security</td>
<td>39%</td>
<td>3%</td>
</tr>
</tbody>
</table>

*Note: VTS 2024 Global Workplace Report*
New Workplace Scorecard

- The thinking about the role of the office in the firm’s production function has become a lot more nuanced

<table>
<thead>
<tr>
<th>Employee Experience</th>
<th>Organizational Dynamics</th>
<th>Financial</th>
<th>ESG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Retention</td>
<td>Collaboration</td>
<td>Cost Management</td>
<td>Carbon Footprint</td>
</tr>
<tr>
<td>Sentiment</td>
<td>Proximity</td>
<td>ROI</td>
<td>Health/Wellness</td>
</tr>
<tr>
<td>Engagement</td>
<td>Future Adaptability</td>
<td>Agility/Flexibility</td>
<td>Valued Employees</td>
</tr>
</tbody>
</table>

- Site-level Utilization
- Space and Place Survey Index
- Policy and Culture Survey Index
- % of Offers Accepted
- Turnover Rates (Elective)
- Employee Satisfaction Index

- Space-level Utilization
- Relationships and Teamwork Survey Index
- Internal Transfers
- Collegiate Networks
- Cross-departmental Exposure
- Regional Connectivity
- Team Attendance Collinearity

- Utilization
- Weighted Average Buildout Age
- Site Operating Costs/SF
- Cost per Visit
- External Meetings & Event Spend
- Chargebacks vs. Utilization-based Burden

- Green Building Rating
- Greenhouse Gases Emission
- Energy Efficiency
- Waste Management
- Health & Safety
- Community Impact
- Diversity & Inclusion
- Business Ethics

Why Employees Come to Office (1)

The primary reasons employees come into the office:

- Team connection and community: 63% in 2021, 68% in 2022, 68% in 2023
- Collaborate face-to-face: 51% in 2021, 56% in 2022, 43% in 2023
- Tools, technologies or spaces: 36% in 2021, 36% in 2022, 26% in 2023
- Work/home boundaries: 21% in 2021, 26% in 2022, 20% in 2023
- Amenities: 15% in 2021, 24% in 2022, 16% in 2023
- Focus: 15% in 2021, 18% in 2022, 15% in 2023
- Better physical set-up: 14% in 2021, 16% in 2022, 12% in 2023

Why Employees Come to Office (2)

Considering your professional development, how important is it to be in the office for the following reasons?

<table>
<thead>
<tr>
<th>Reason</th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>New employee integration meetings</td>
<td>42%</td>
<td>34%</td>
<td>24%</td>
</tr>
<tr>
<td>Developing relationships with colleagues within my team</td>
<td>31%</td>
<td>37%</td>
<td>32%</td>
</tr>
<tr>
<td>Morale and relationship building</td>
<td>34%</td>
<td>33%</td>
<td>33%</td>
</tr>
<tr>
<td>To collaborate face-to-face with members of my team</td>
<td>26%</td>
<td>33%</td>
<td>41%</td>
</tr>
<tr>
<td>Mentoring and feedback</td>
<td>27%</td>
<td>30%</td>
<td>43%</td>
</tr>
<tr>
<td>Professional development trainings</td>
<td>21%</td>
<td>32%</td>
<td>47%</td>
</tr>
<tr>
<td>Collaboration around substantive work product</td>
<td>22%</td>
<td>30%</td>
<td>47%</td>
</tr>
<tr>
<td>Access to tools, technologies, or spaces that are only available at the office</td>
<td>23%</td>
<td>25%</td>
<td>52%</td>
</tr>
<tr>
<td>Developing relationships with colleagues outside my team</td>
<td>14%</td>
<td>34%</td>
<td>52%</td>
</tr>
<tr>
<td>For a better physical set-up (ergonomics, furniture, equipment, etc.) that is optimal for my job</td>
<td>23%</td>
<td>23%</td>
<td>54%</td>
</tr>
<tr>
<td>To set boundaries between work and home</td>
<td>21%</td>
<td>20%</td>
<td>59%</td>
</tr>
<tr>
<td>To utilize amenities and services</td>
<td>17%</td>
<td>24%</td>
<td>59%</td>
</tr>
<tr>
<td>To focus and be productive</td>
<td>20%</td>
<td>14%</td>
<td>66%</td>
</tr>
</tbody>
</table>

Source: CBRE U.S. Workplace Sentiment Surveys, 2021-2023
How important is the office for meetings with the following participants?

- With leadership/mentors: 36% High Priority, 32% Medium Priority, 32% Low Priority
- With colleagues on my team: 31% High Priority, 32% Medium Priority, 37% Low Priority
- With colleagues based in my office: 21% High Priority, 37% Medium Priority, 42% Low Priority
- With members of my team visiting from another office: 28% High Priority, 29% Medium Priority, 43% Low Priority
- With colleagues visiting from another office: 21% High Priority, 29% Medium Priority, 50% Low Priority

Implications of WFH for Labor Productivity

- The ability to WFH at least some of the time is clearly a highly-valued non-wage amenity (Colonnelli et al. 2023)
- But how does it affect labor productivity?
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- But how does it affect labor productivity?
- Mixed findings of effects of remote work on individual and team productivity
  - Trade-off between ease of measurement/identification and specificity of setting (e.g., call centers, software coders)
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- WFH also impacts number of hours worked (less time wasted commuting, more slacking off?)
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Impact on corporate culture and on-the-job learning (mentoring).
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➢ But how does it affect labor productivity?

➢ Mixed findings of effects of remote work on individual and team productivity

➢ WFH also impacts number of hours worked (less time wasted commuting, more slacking off?)

➢ Impact on corporate culture and on-the-job learning (mentoring)

➢ Coordination: multiple equilibria; complicates inference
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- **Revealed preference**: Using office demand (current/prospective, or remote job postings, firm profits, stock returns, CRE prices) **to measure** (firms’ perceptions of) productivity impact of WFH
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- **Cost of office vs. productivity change**
  - Office employee uses 200 sf at $50/sf = $10,000 per year
  - Large compared to firms’ share of employee’s output of $25,000 (at $50,000 average office-worker salary)
Implications for Innovation and Global Labor Markets

- Effects on innovation even harder to establish
  - Cities have been engines of innovation and scientific discovery for centuries (Glaeser, Moretti). Will innovation suffer with WFH?
  - But, lots of startups formed during covid, many remote-only.
    - Sedlacek and Shi (2024) find that WFH accounts for 1/3 of increase in firm entry.
    - WFH shifts activity to small businesses, increases allocative efficiency, output, and welfare.
Implications for Innovation and Global Labor Markets

- Effects on innovation even harder to establish
- Profound implications for global labor markets
  - Should a *remote* worker who “works in NYC” earn a NYC salary?
  - Why hire a software engineer in NYC for $150,000 if the same talent costs $50,000 in Costa Rica?
  - Future technology improvements likely to amplify these choices
Message from Urban Economics Models About WFH

- Lots of new work on spatial equilibrium models with WFH
  - Among others: Davis Ghent Gregory 23; Deventhal Parkhomenko 22; Monte Porcher Rossi-Hansberg 23; Kyriakopoulou Picard 22; Brueckner Kahn Lin 23; Behrens, Kichko and Thisse 21; Gokan, Kichko, Matheson and Thisse 22
Message from Urban Economics Models About WFH

- Lots of new work on spatial equilibrium models with WFH
- Setup (Deventhal-Parkhomenko 22, Davis-Ghent-Gregory 23)
  - Multiple locations, heterogeneous workers
  - In each location, space is used for housing, home office, or on-site office
  - Time split between on-site work, remote work (for teleworkable jobs/firms), commuting, and leisure
  - On-site and remote work are complementary inputs in production function; agglomeration benefits stronger from on-site than from remote work; WFH adoption externality
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- Setup (Deventhal-Parkhomenko 22, Davis-Ghent-Gregory 23)
- Remote work revolution: why did so many more (esp. high-skilled) workers switch to WFH after 2020?
  - Change in preferences: lower aversion to WFH
  - Change in technology: remote work became more productive
Message from Urban Economics Models About WFH

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- Setup (Deventhal-Parkhomenko 22, Davis-Ghent-Gregory 23)
- Remote work revolution: why did so many more (esp. high-skilled) workers switch to WFH after 2020?
- Predictions
  - Migration to less dense, more elastic areas; yet less commuting
  - Office and urban rents fall, suburban rents rise in short-run (more home office space demand)
  - Long-run, space reallocation to suburbs, reversing price effects
  - Aggregate welfare \( \uparrow \) because **aggregate labor productivity increases** (high-skilled more productive WFH), commuting reduced, despite lower agglomeration benefits
  - More inequality; telecommuters gain
Coordination and Agglomeration Effects

► Maybe there was no big change to preferences or technology?
► Setup (Monte-Percher-RossiHansberg 23)
  ► Coordination issues around WFH lead to multiple equilibria when agglomeration benefits from in-person interactions are strong enough (in certain industries/cities)
  ► Covid was a large shock that forced nearly everyone to WFH
  ► After restrictions lifted, large cities got stuck in the high-WFH equilibrium
  ► Calibration: WFH is less productive than on-site work, agglomeration effects strong in large cities
Coordination and Agglomeration Effects

► Maybe there was no big change to preferences or technology?
► Setup (Monte-Percher-RossiHansberg 23)
► Results
  ► CBD trips remain depressed in large cities, reverse in small cities
  ► Price gradients flatten in large cities, reverse in small cities
  ► Wages fall 15-25% for cities stuck in high-WFH equilibrium
  ► Aggregate welfare ↓ because aggregate productivity is lower with WFH; agglomeration benefits stronger than commuting costs.
Coordination and Agglomeration Effects

- Maybe there was no big change to preferences or technology?
- Setup (Monte-Percher-RossiHansberg 23)
- Results

**Where does that leave us?** Empirical/calibration questions key to welfare:

- How strong are the productivity losses or gains from WFH?
- How strong the agglomeration benefits from in-person vs. hybrid interaction?
- Can we still calibrate agglomeration effects based on pre-covid evidence? Or are we in a new regime with weaker agglomeration benefits (Liu and Su 22)?
New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis
   - Anemic leasing volumes, highest office vacancy rate in 40 years: 22% office space available or 92M sf in Manhattan

Note: Cushman & Wakefield

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**Graphic:**

- Manhattan Occupancy Rate

**Note:**  Cushman & Wakefield
New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis

   ▶ NYC office stock worth about 50% less than pre-2020, most of which not yet realized/recognized

Note: Gupta, Mittal, Van Nieuwerburgh (2023)
New WFH Landscape Creates Interlocking Crises

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2. Spillovers on transit, amenities, and local economic activity
   - Urban transit viability

Note: MTA
New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis

2. Spillovers on transit, amenities, and local economic activity
   - Urban transit viability
   - Reduced retail activity (jobs), construction (jobs), neighborhood vibrancy and safety

3. Debt crisis
   - Many office owners underwater on debt
   - Only 1/3 of office debt was paid off at maturity in 2023, 1/3 extended, 1/3 defaulted
   - Local banks, heavily exposed to CRE loans, face credit risk and are tightening credit

4. Fiscal crisis
   - Commercial property tax (15%), tenant rent tax, sales tax, income tax all affected by lower CRE values and vacancy
   - Risk of an urban doom loop

5. Housing crisis, with no effective housing supply policies in place, complex political environment

6. Climate crisis: buildings responsible for 70% of GHG emissions in our cities (30% of global emissions)
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   ![CMBS Delinquency Rates by Major Property Type]

   Note: Trepp

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Note: Moody’s Analytics
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(a) Sources of NYC Tax
(b) Sources of Property Tax

Risk of an urban doom loop
5. Housing crisis, with no effective housing supply policies in place, complex political environment
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Diagram:

- Real Estate Value ↓
- Out Migration ↑
- Spending and Taxation ↓
- Tax Revenue ↓
- Risk of an urban doom loop
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Converting Brown Offices to Green Apartments

- Contributes to a solution to all these problems: too much office, too little housing, too much emissions

Gupta, Martinez, Van Nieuwerburgh (Brookings 2023)
Converting Brown Offices to Green Apartments

- Contributes to a solution to all these problems: too much office, too little housing, too much emissions
  Gupta, Martinez, Van Nieuwerburgh (Brookings 2023)

- Obstacles for OTA conversions are substantial
  - Physical suitability (depth of floorplates, operable windows, plumbing,...)
  - Regulatory and bureaucratic (zoning & building codes)
  - Economic return
    - Requires low purchase price (older, class B/C)
    - Requires reasonable conversion costs
    - Requires strong apartment market
Converting Brown Offices to Green Apartments

- Contributes to a solution to all these problems: too much office, too little housing, too much emissions
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- Obstacles for OTA conversions are substantial

- Does not pencil with affordable housing requirement
Converting Brown Offices to Green Apartments

- Contributes to a solution to all these problems: too much office, too little housing, too much emissions
  *Gupta, Martinez, Van Nieuwerburgh (Brookings 2023)*

- Obstacles for OTA conversions are substantial

- Does not pencil with affordable housing requirement
  - Unless there is a policy to support it
  - Density bonus
  - Property tax abatements and exemptions
  - Subsidized debt
  - Leverage federal, state, and local resources (e.g., IRA, DOT, HUD)
Rationale for Government Intervention

- Can’t the private market solve this problem?

- Three externalities associated with office and retail trouble call for *swift* intervention
  - Vacancy externality
  - Foreclosure externality
  - Climate externality

- Rental housing development in Manhattan usually does not pencil without policy intervention, esp. with affordable housing
Remote Work Revolution

**The remote work revolution: Impact on real estate values and the urban environment: 2023 AREUEA Presidential Address**

Stijn Van Nieuwerburgh

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**Abstract**

The covid-19 pandemic induced a major shift in the prevalence of remote and hybrid work arrangements. This review article studies the effects of this remote work revolution for residential and commercial real estate values and for the future of cities. It also discusses consequences for productivity, innovation, local public finance, and the climate. The last part of the article discusses policy interventions.
Own Writings

- “The Remote Work Revolution,” *Real Estate Economics*, Jan 2023
- “Work From Home and the Office Real Estate Apocalypse,” *SSRN working paper*, Jun 2022, latest draft: Oct 2023
- “Converting Brown Offices to Green Apartments,” *Brookings Institute Hamilton Papers*, July 2023

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How the rise of teleworking will reshape labor markets and cities.

Gupta, A., Martinez, C., Van Nieuwerburgh, S., 2023a.
Converting brown offices to green apartments.

Flattening the curve: pandemic-induced revaluation of urban real estate.

Gupta, A., Mittal, V., Van Nieuwerburgh, S., 2023b.
Work from home and the office real estate apocalypse.
Available at SSRN: https://ssrn.com/abstract=4124698.

Kyriakopoulou, E., Picard, P.M., 2022.
The zoom city: Working from home and urban land use.
Available at SSRN: https://ssrn.com/abstract=4181946.

The effect of working from home on the agglomeration economies of cities: Evidence from advertised wages.

Remote work and city structure.
Outline

▶ Facts
  ▶ Migration
  ▶ Remote work
  ▶ Residential prices and rents
  ▶ Office rents, leasing activity, occupancy

▶ Theories
  ▶ Finance tradition
  ▶ Urban economics tradition

▶ Implications
  ▶ Other real estate types
  ▶ Investors - financial fragility
  ▶ Local governments - urban doom loop
  ▶ Productivity, labor markets, and innovation
  ▶ Climate

▶ Policy responses