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

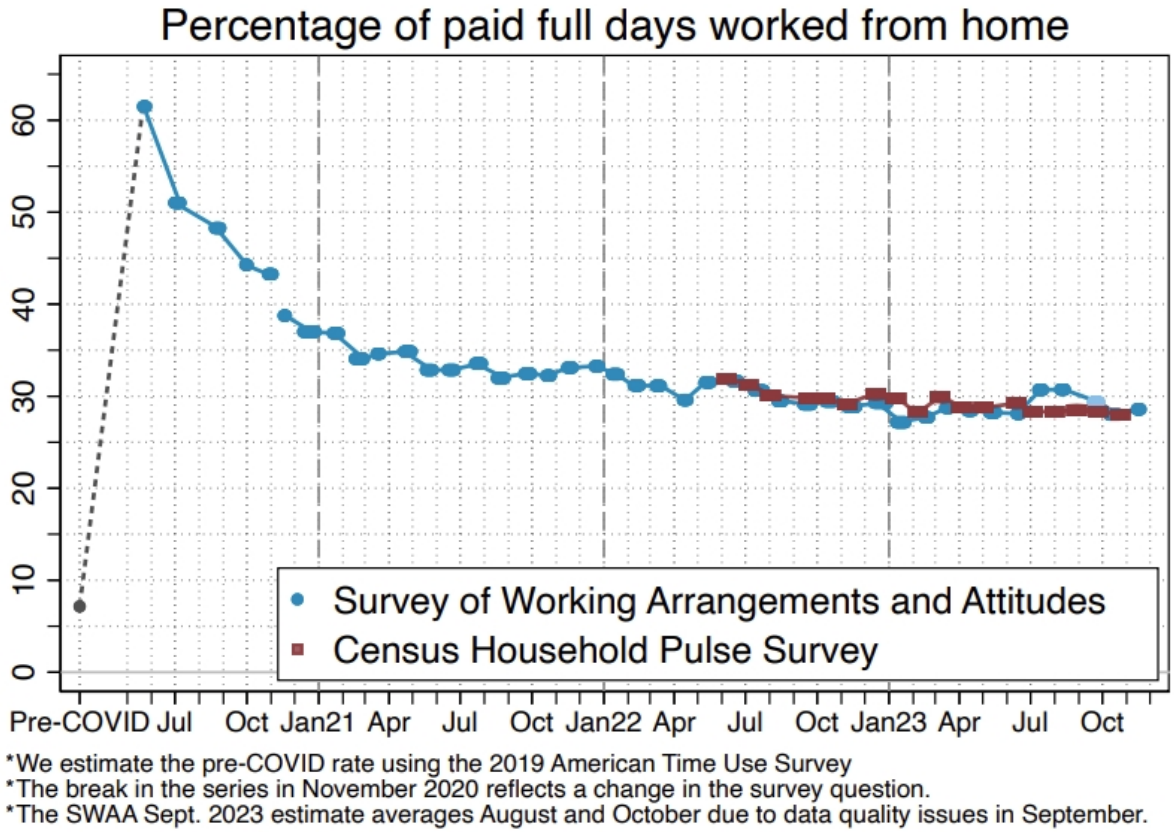
Remote Work Revolution

"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

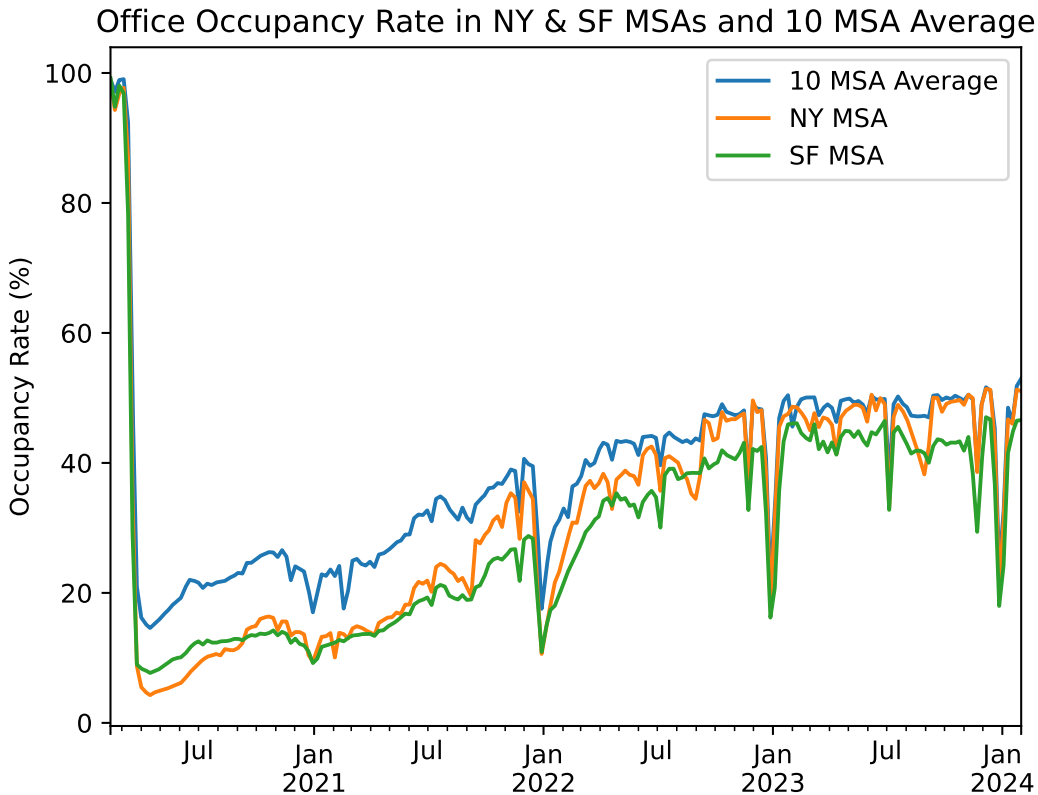


Note: SWWA, Barrero, Bloom, and Davis (2021)

- 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

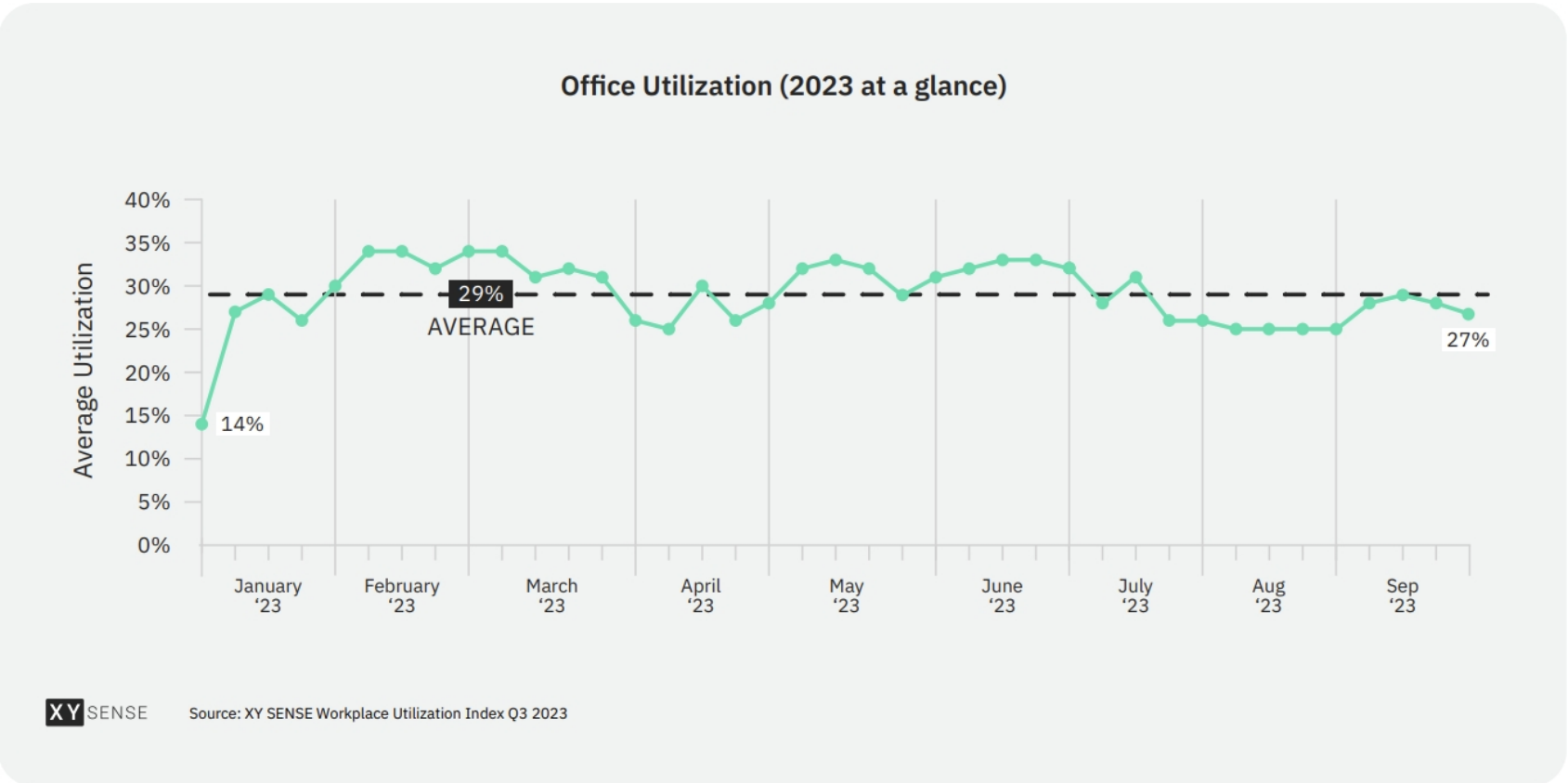


Note: Kastle Workplace Barometer

Office Utilization Rate

By region | By type

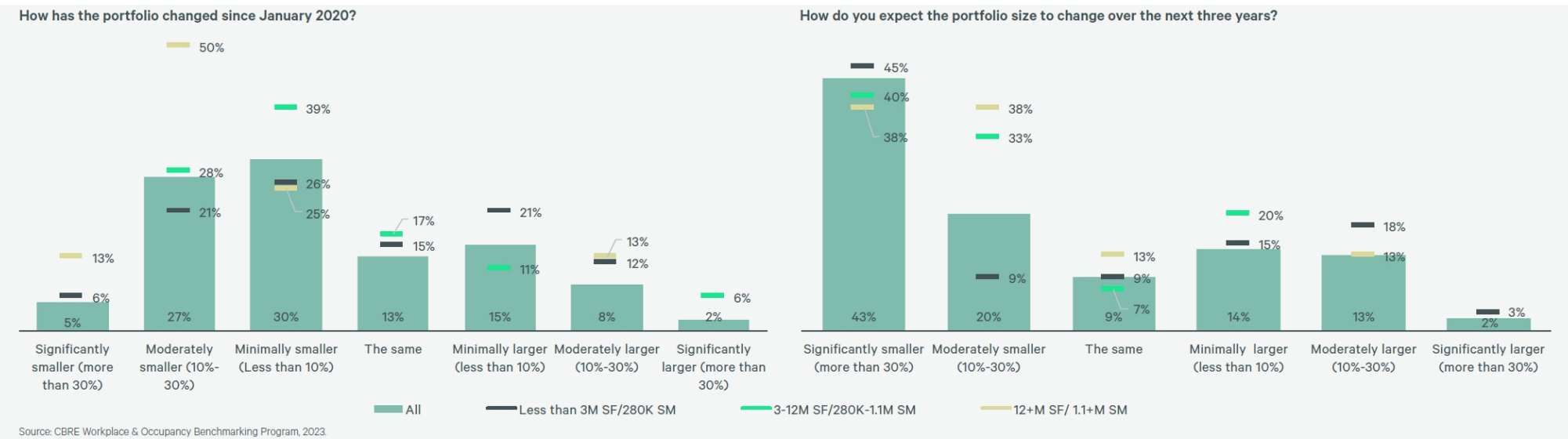
- Around 30% in U.S.; peak utilization at 45%



Note: XY Sense – based on sensor data

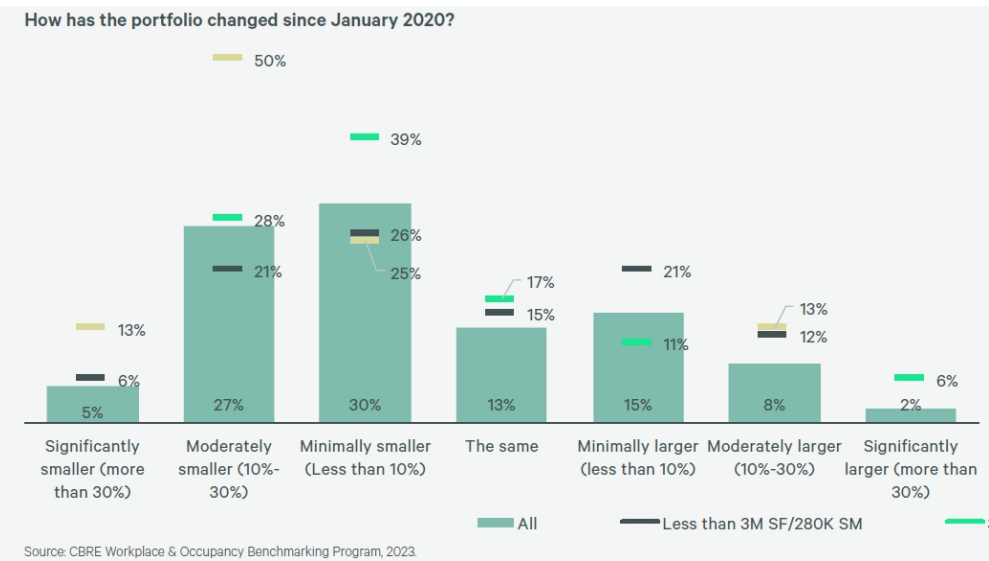
Reduction in Space Demand by Firm Size

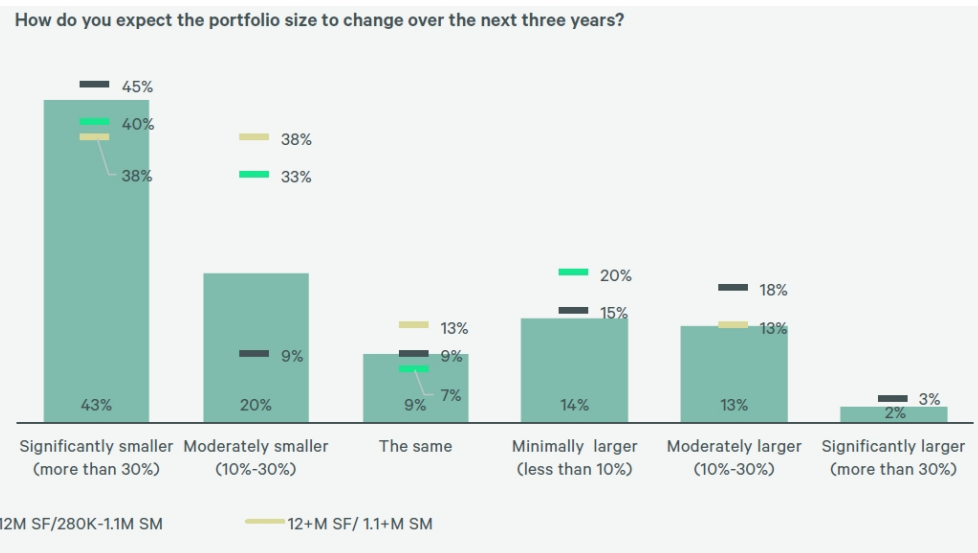
- Past 4 years (2020-2023)
  - 83% of large firms ($>$ 12 mi sf) have cut office space; 50% by 10-30%, 13% by more than 30%
  - 67% of medium firms (3-12 mi sf) have cut office space
  - 53% of small firms ($<$3 mi sf) have cut office space



Reduction in Space Demand by Firm Size

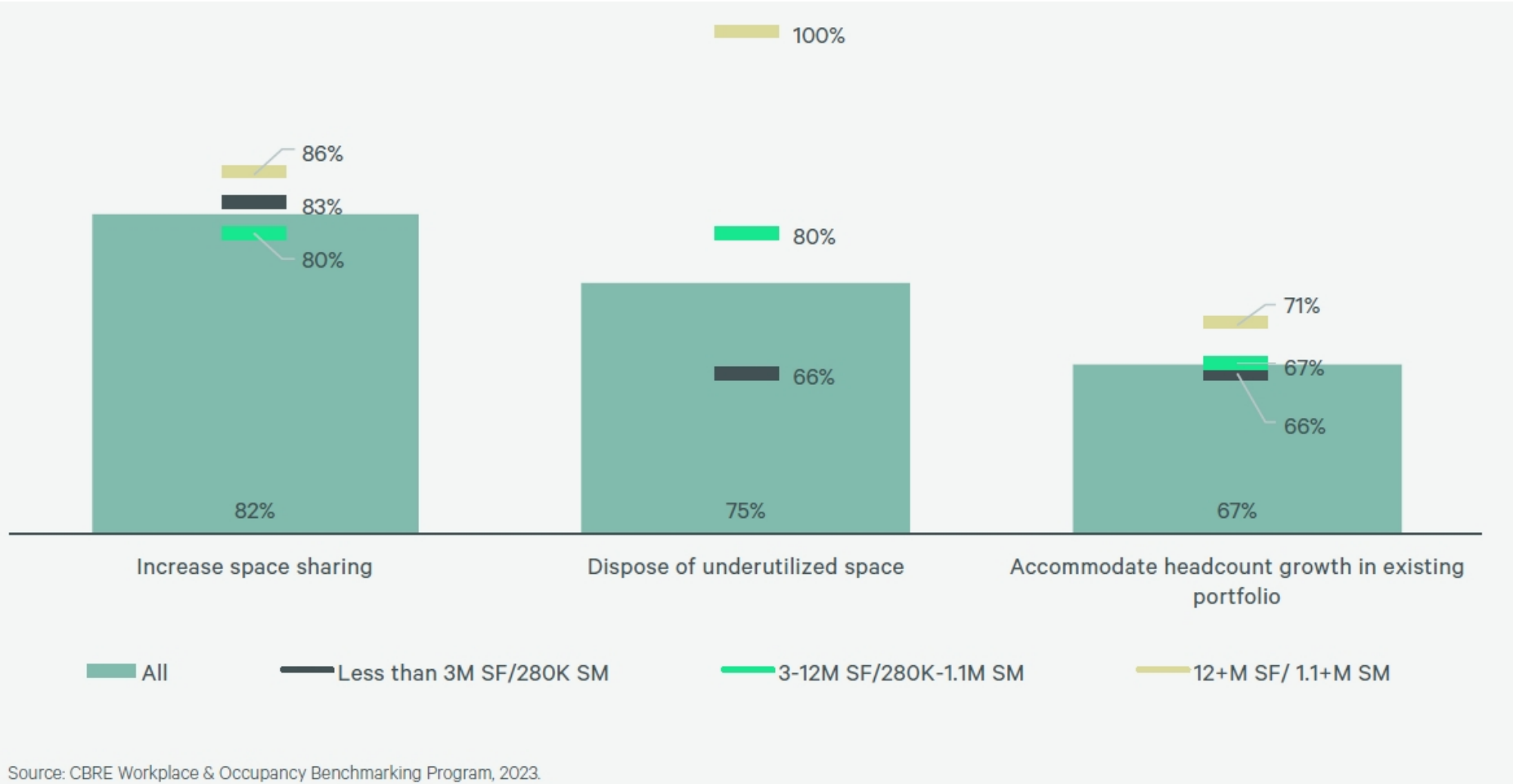
- Next 3 years (2024-2026)
  - 74% of large firms plan to cut; 38% by more than 30%
  - 73% of medium firms plan to cut; 40% by more than 30%
  - 54% of small firms plan to cut; 45% by more than 30%





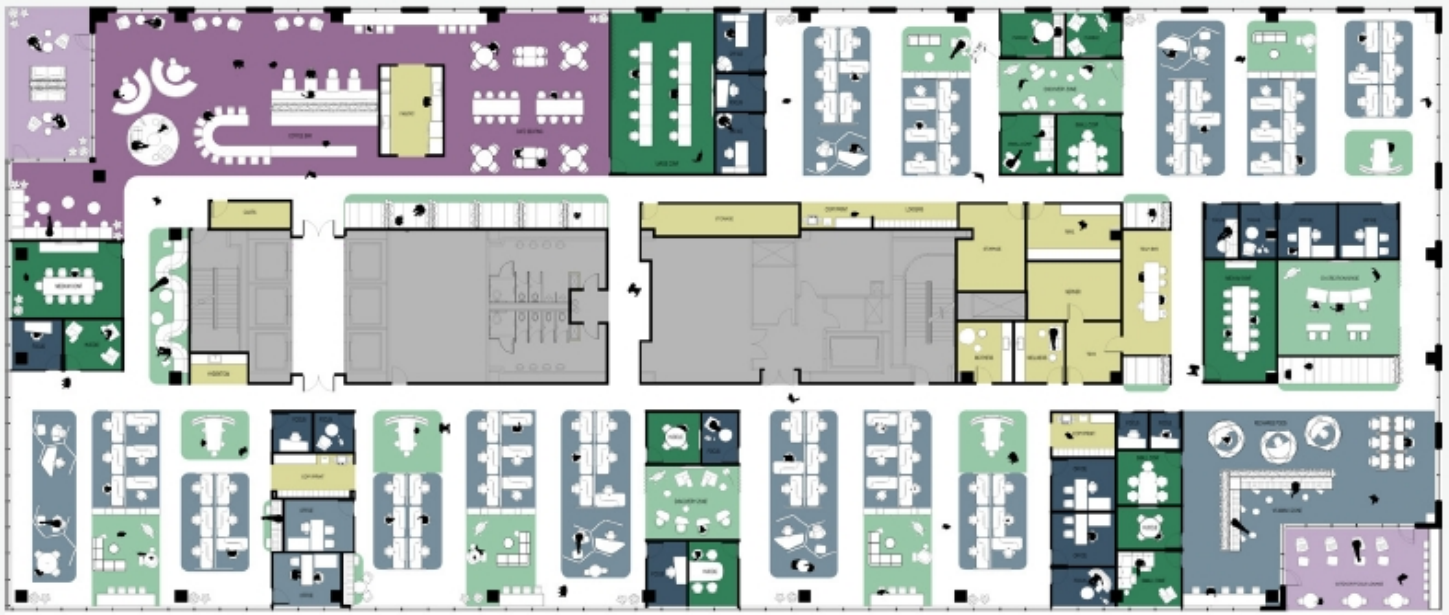
Optimizing Real Estate Portfolio

- Hot-desking/hotelling, office neighborhoods, AirBnB for office



Source: CBRE Workplace & Occupancy Benchmarking Program, 2023.

Alternative Work Seats



40% Me | 20% We | 15% Support | 25% Amenity

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

Concentration

Curated

Organic

Co-Creation

50% Me
15% We
17% Support
17% Amenity

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

40% Me
20% We
15% Support
25% Amenity

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.

25% Me
38% We
10% Support
28% Amenity

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.

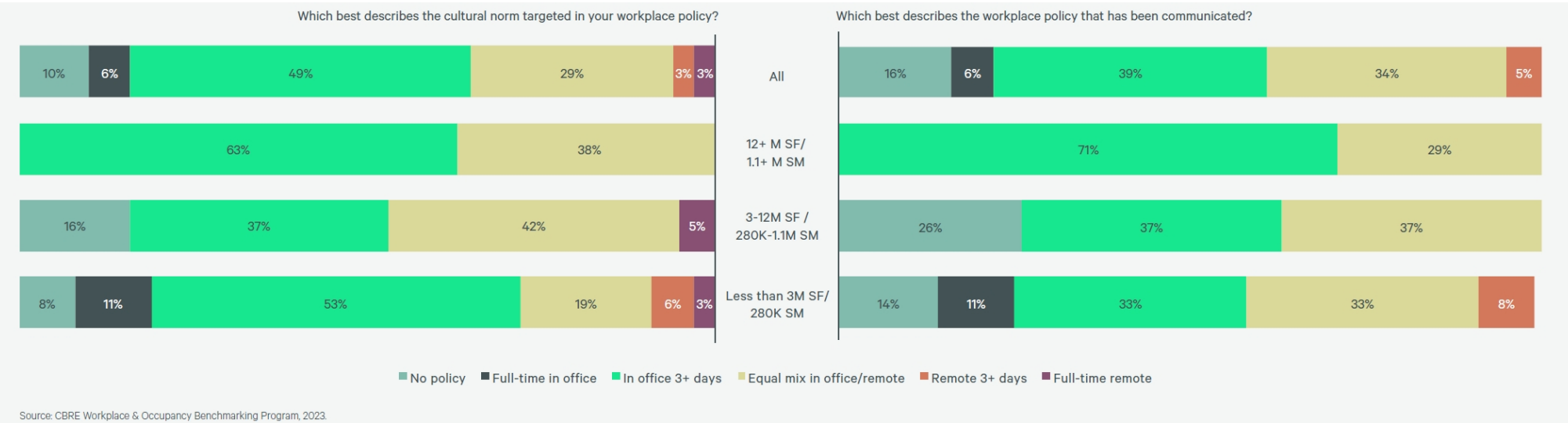
12% Me
48% We
10% Support
30% Amenity

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.

Source: CBRE Design Collective, 2023.

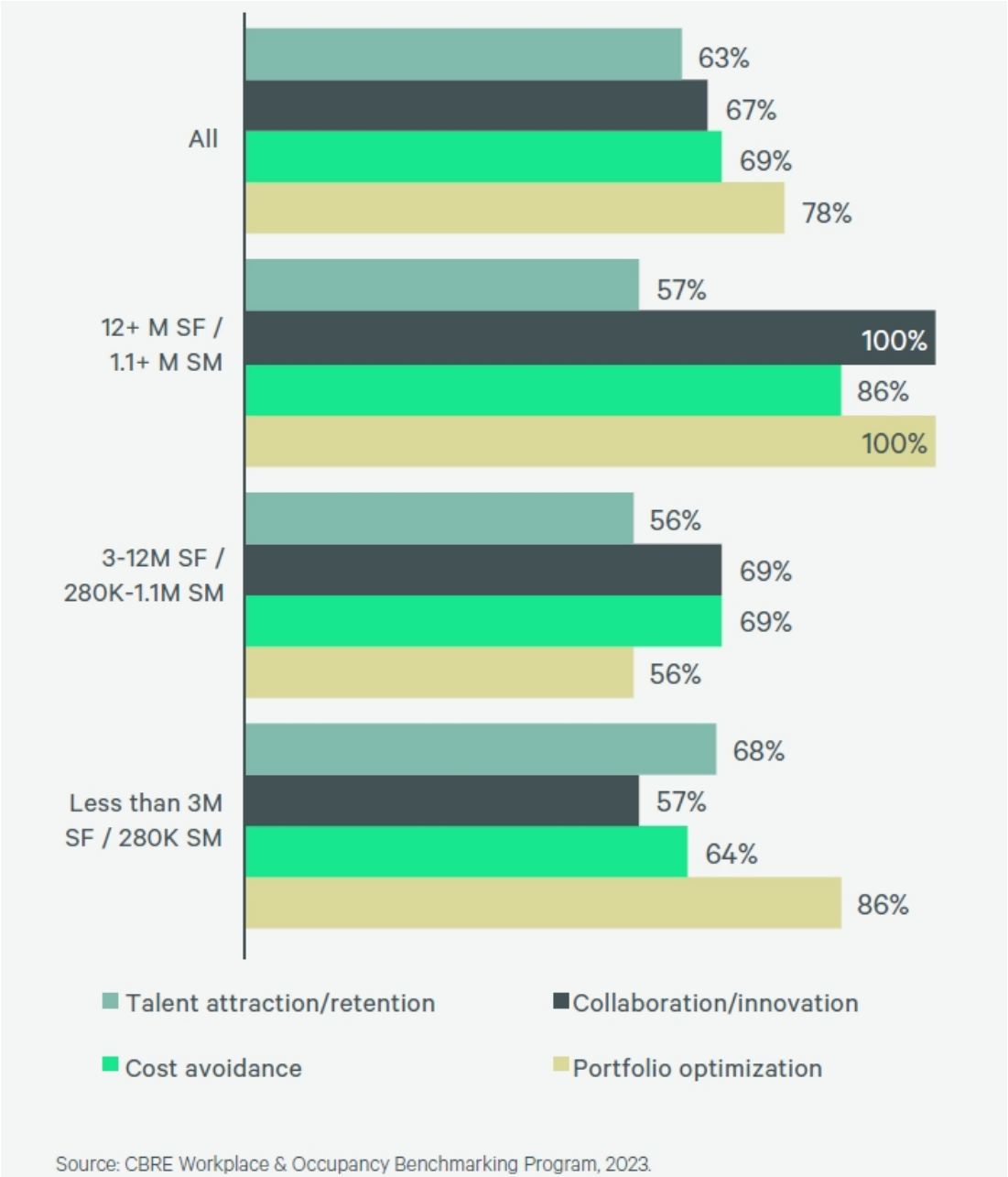
Hybrid Work is Dominant Mode of Work

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

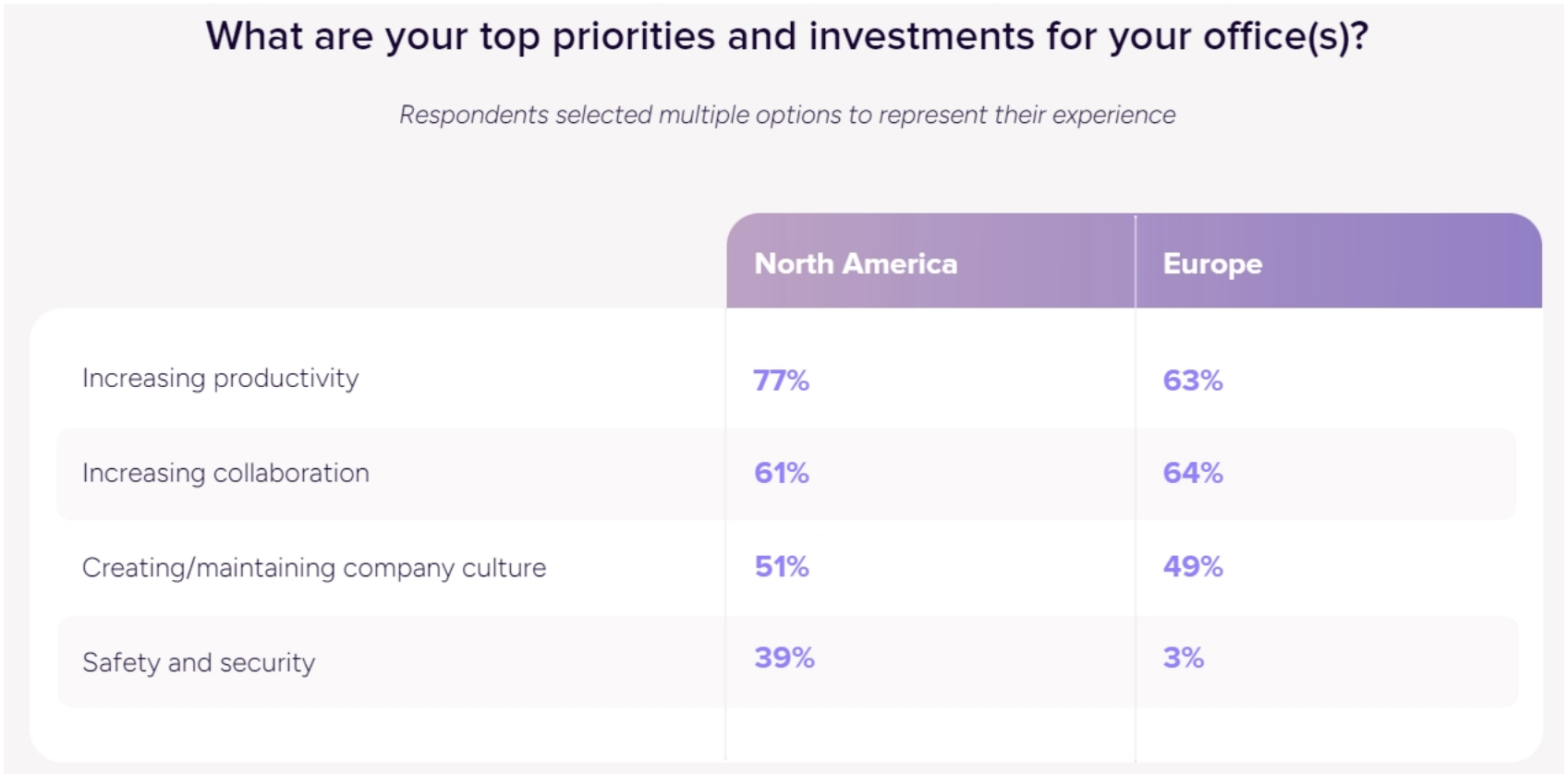


Source: CBRE Workplace & Occupancy Benchmarking Program, 2023.

Why Employers Support Hybrid Work



Employers Prioritize Productivity



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

Respondents selected multiple options to represent their experience

	North America	Europe
Increasing productivity	77%	63%
Increasing collaboration	61%	64%
Creating/maintaining company culture	51%	49%
Safety and security	39%	3%

Note: VTS 2024 Global Workplace Report

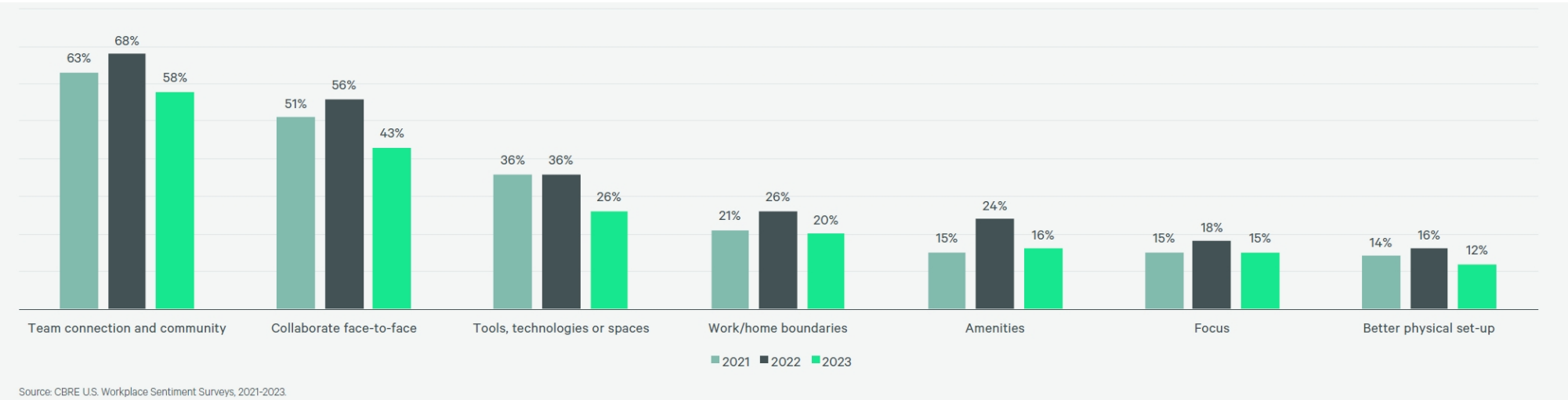
New Workplace Scorecard

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

Source: CBRE Workplace & Occupancy Management, 2023.

Why Employees Come to Office (1)

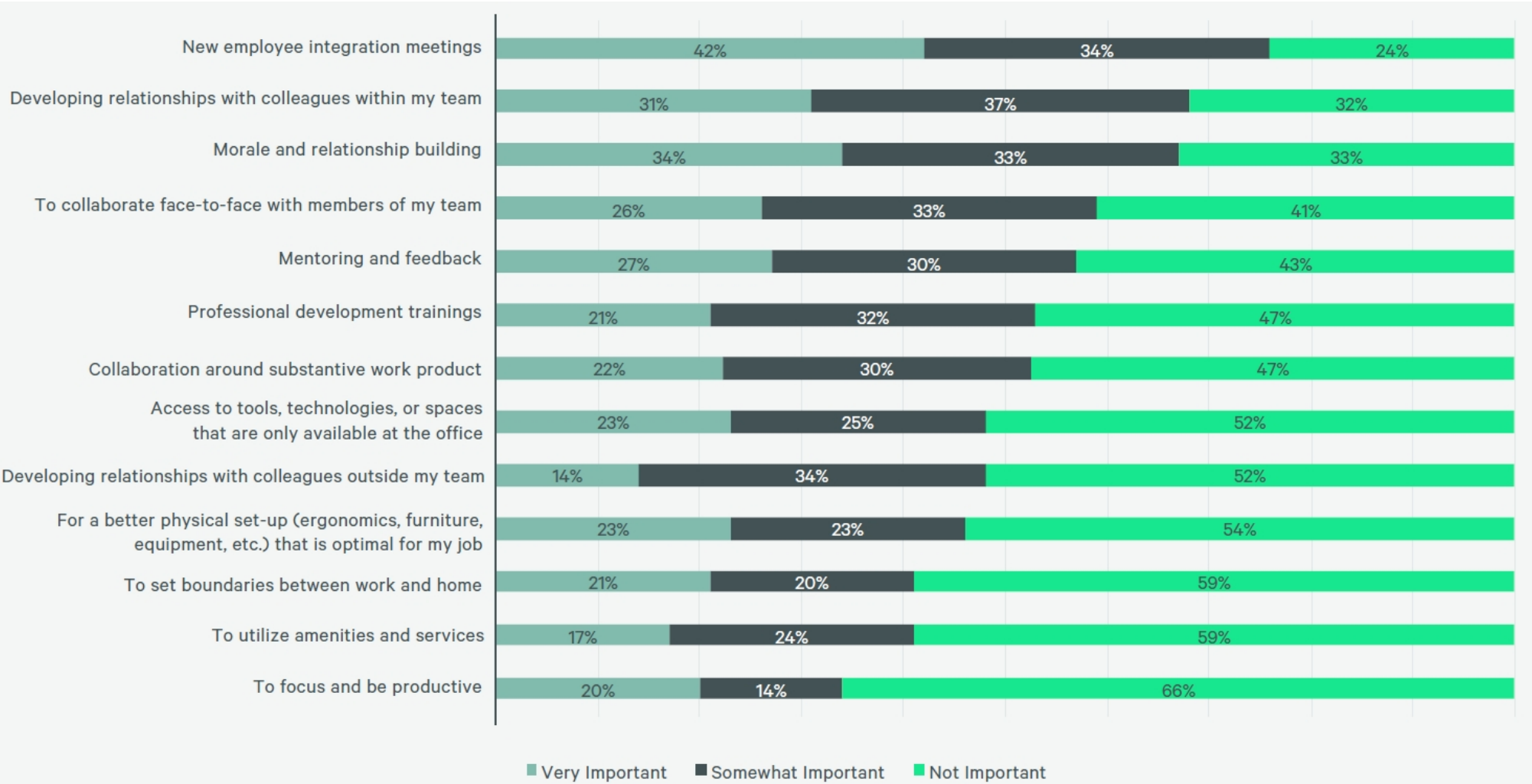
- The primary reasons employees come into the office:



Source: CBRE U.S. Workplace Sentiment Surveys, 2021-2023.

Why Employees Come to Office (2)

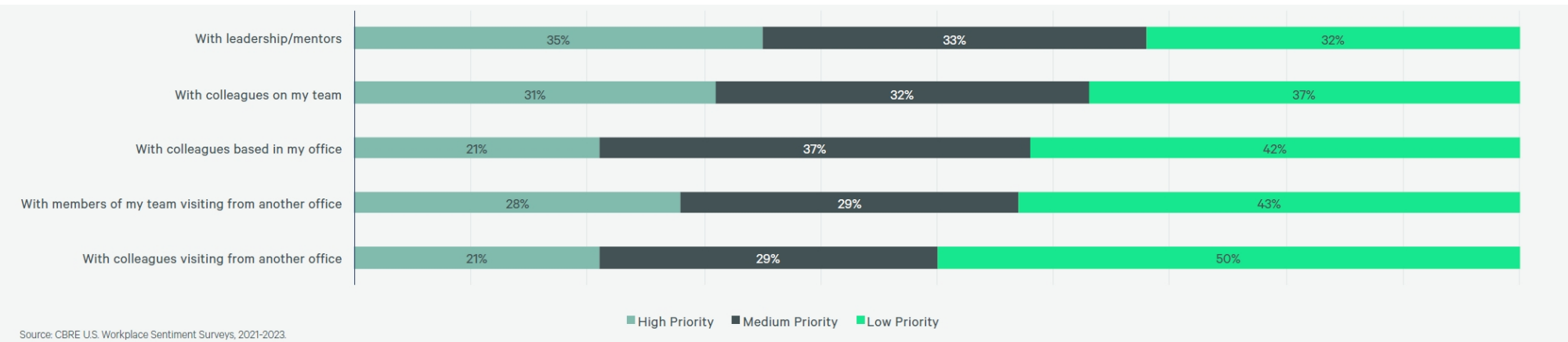
- Considering your professional development, how important is it to be in the office for the following reasons?



Source: CBRE U.S. Workplace Sentiment Surveys, 2021-2023.

Why Employees Come to Office (3)

- How important is the office for meetings with the following participants?



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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- 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**
- 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

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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 ↑ 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

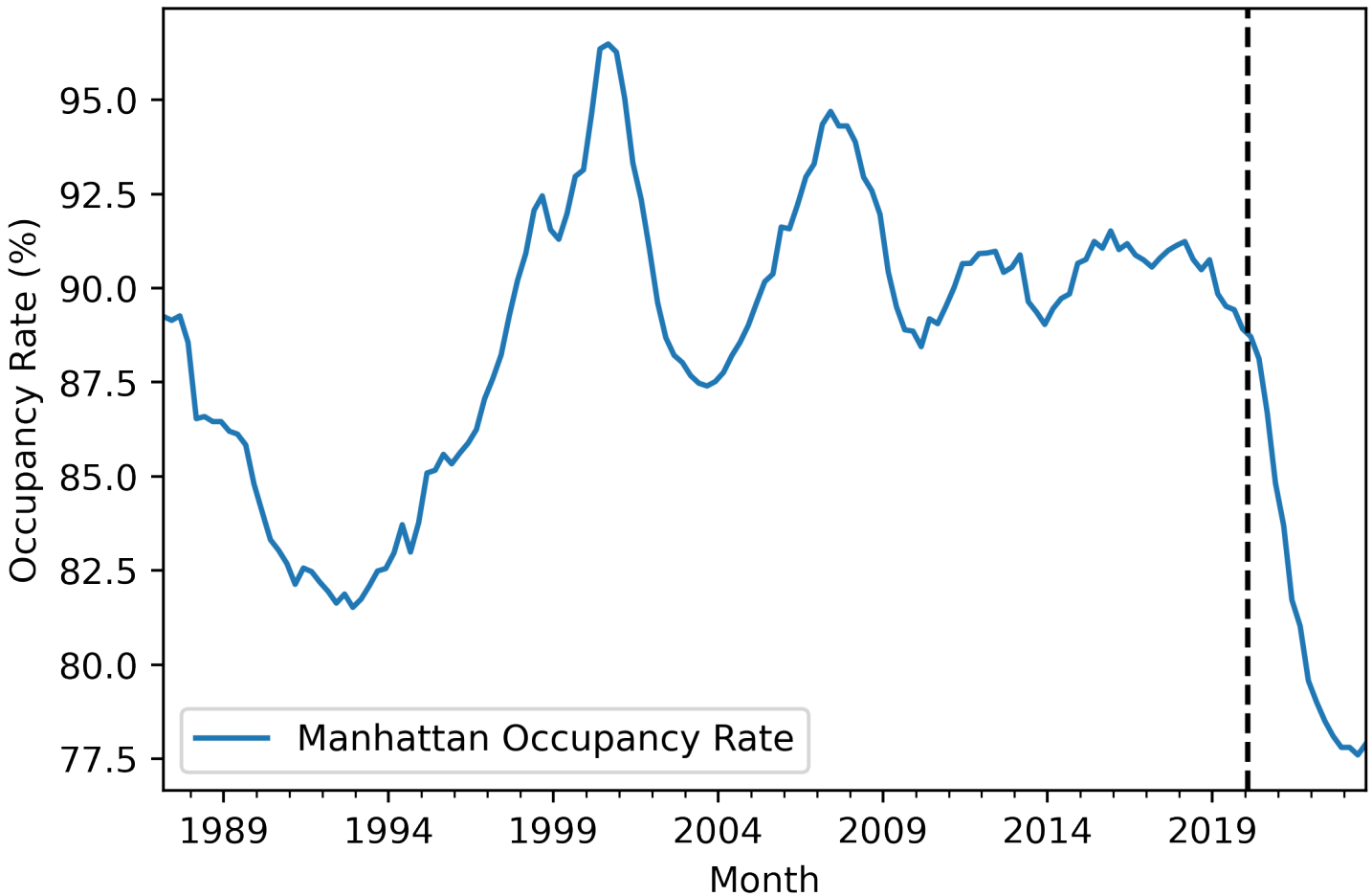
- Maybe there was no big change to preferences or technology?
- Setup (Monte-Percher-RossiHansberg 23)
- Results
  - CBD trips remain depressed in large cities, reverse in small cities
  - Price gradients flatten in large cities, reverse in small cities
  - Wages fall 15-25% for cities stuck in high-WFH equilibrium
  - Aggregate welfare $\downarrow$ 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

New WFH Landscape Creates Interlocking Crises

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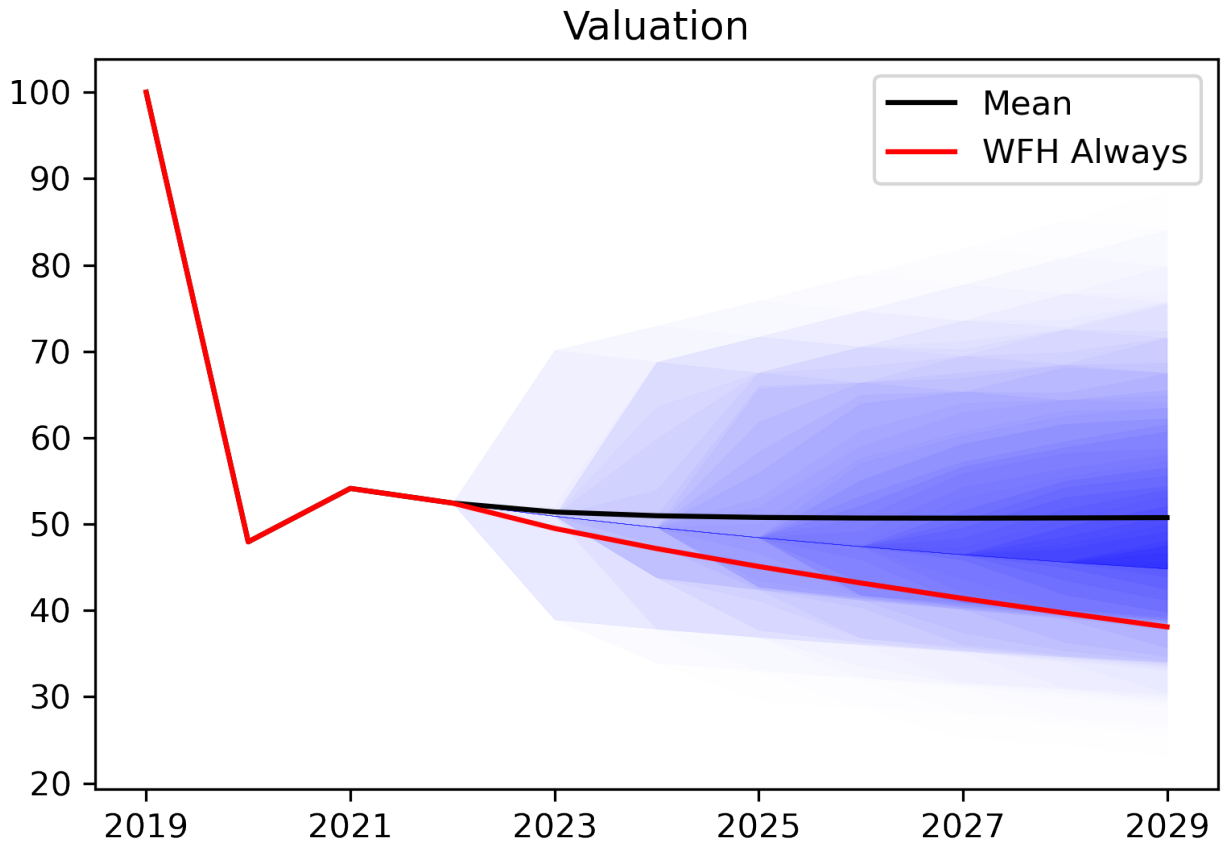
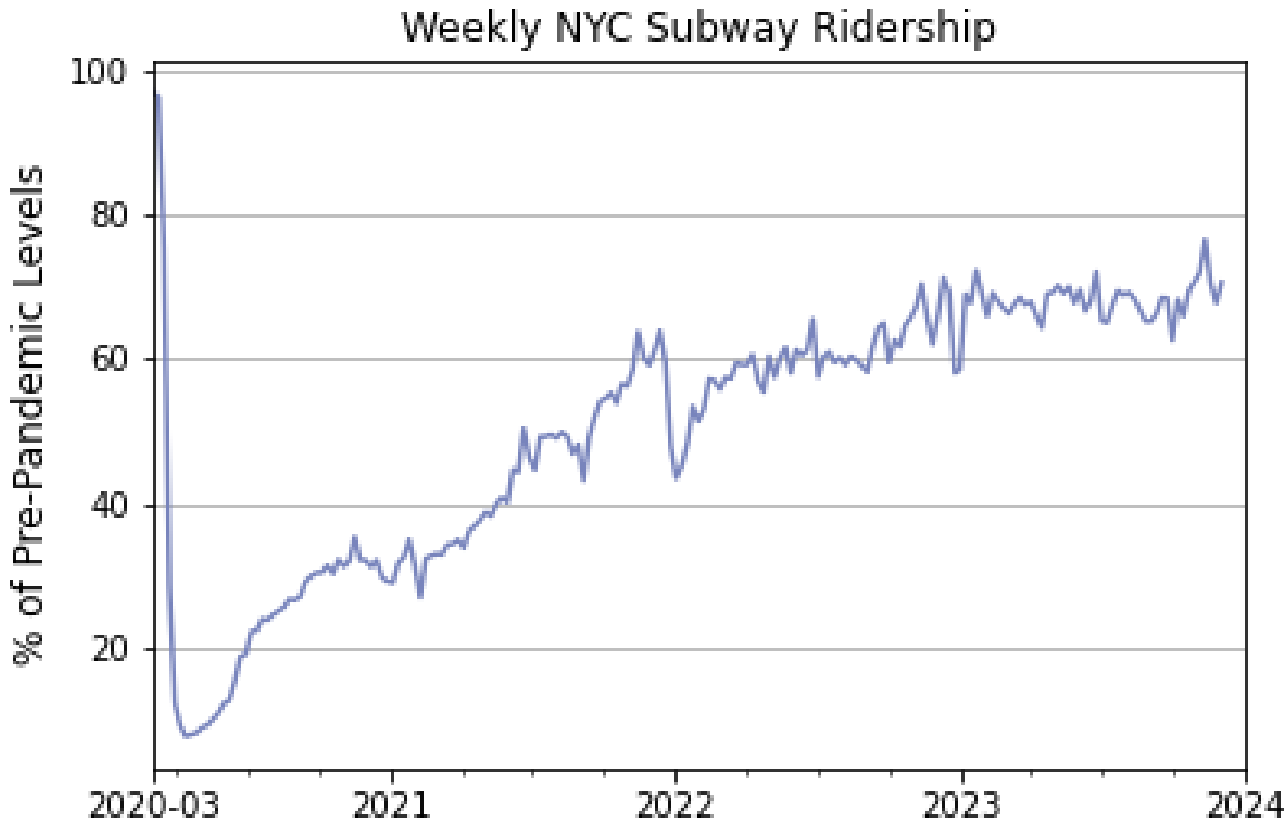
   - NYC office stock worth about 50% less than pre-2020, most of which not yet realized/recognized



Note: Gupta, Mittal, Van Nieuwerburgh (2023)

New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis
2. Spillovers on transit, amenities, and local economic activity
   - Urban transit viability



Note: MTA

New WFH Landscape Creates Interlocking Crises

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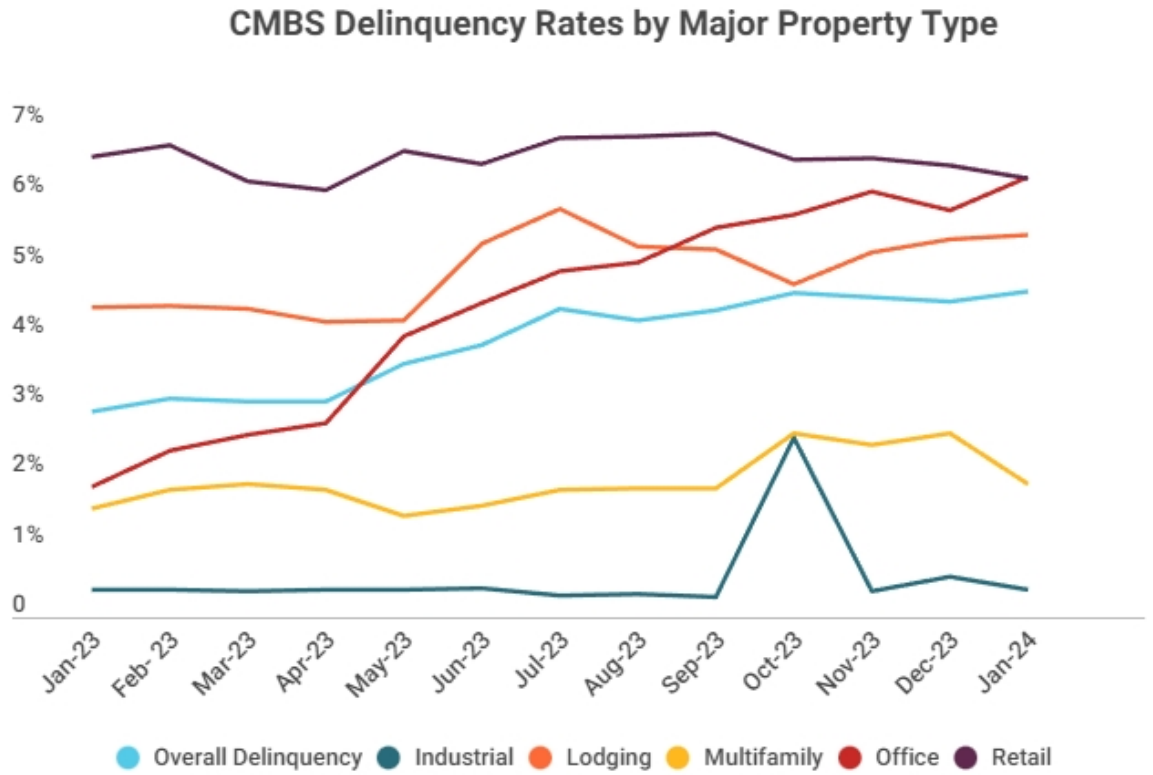
   - Urban transit viability
   - Reduced retail activity (jobs), construction (jobs), neighborhood vibrancy and safety

New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis
2. Spillovers on transit, amenities, and local economic activity
3. Debt crisis
   - Many office owners under-water on debt
   - Only 1/3 of office debt was paid off at maturity in 2023, 1/3 extended, 1/3 defaulted



Note: Trepp

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3. Debt crisis
   - Many office owners under-water on debt
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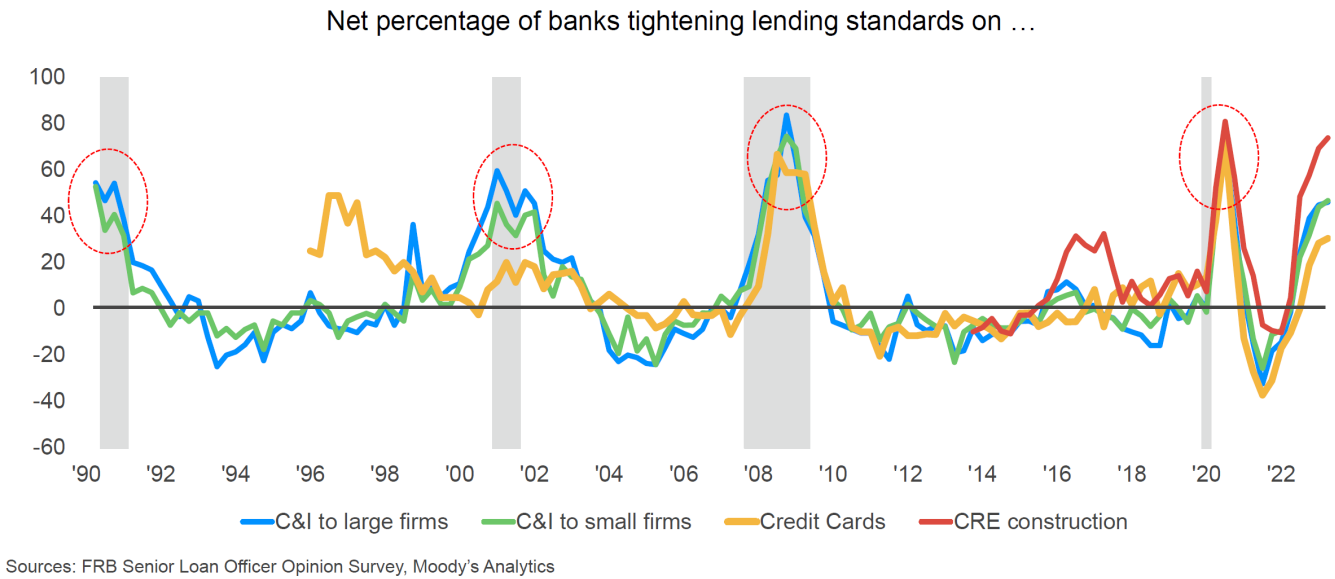
   - Local banks, heavily exposed to CRE loans, face credit risk and are tightening credit



Note: Moody's Analytics

New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis
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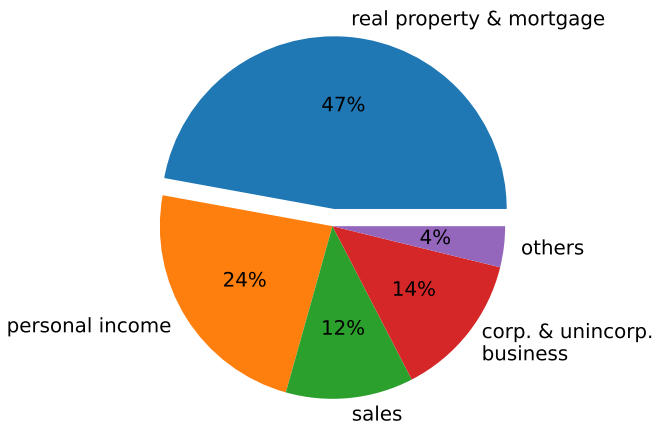
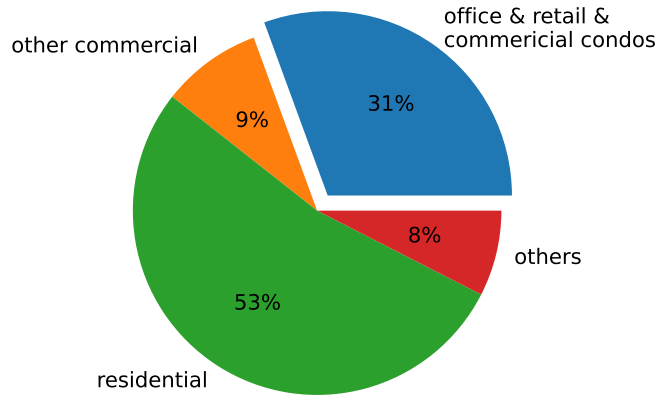
3. Debt crisis
4. Fiscal crisis
   - Commercial property tax (15%), tenant rent tax, sales tax, income tax all affected by lower CRE values and vacancy



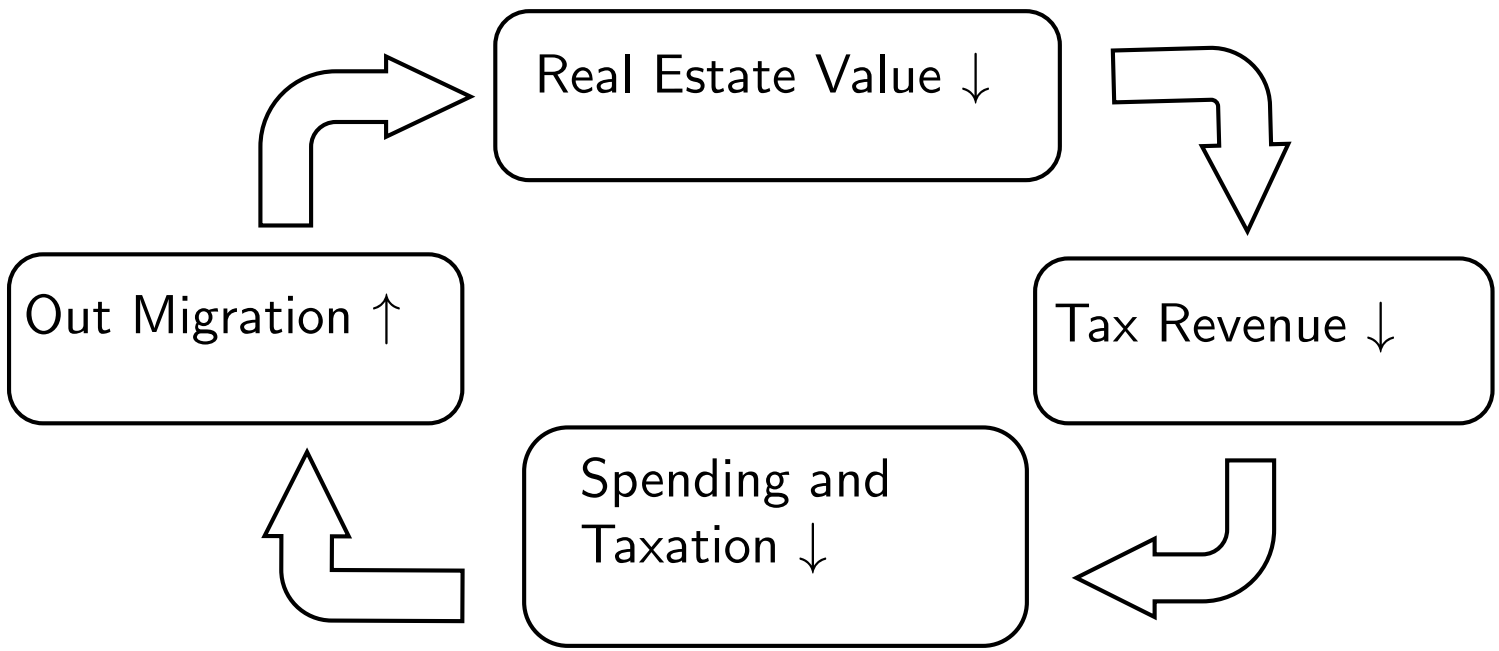
(a) Sources of NYC Tax



(b) Sources of Property Tax

New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis
2. Spillovers on transit, amenities, and local economic activity
3. Debt crisis
4. Fiscal crisis
   - Risk of an urban doom loop



New WFH Landscape Creates Interlocking Crises

1. Office vacancy and valuation crisis
2. Spillovers on transit, amenities, and local economic activity
3. Debt crisis
4. Fiscal crisis
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)

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

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  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

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- Does not pencil with affordable housing requirement

Converting Brown Offices to Green Apartments

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  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

REAL ESTATE ECONOMICS

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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.

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Figures References Related Information

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Outline

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  - Investors - *financial fragility*
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  - Productivity, labor markets, and innovation
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