Work From Home and the Office Real Estate Apocalypse

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Commuting to office work is obsolete. It is now infinitely easier, cheaper and faster to do what the nineteenth century could not do: move information, and with it office work, to where the people are.

Commuting to office work is obsolete. It is now infinitely easier, cheaper and faster to do what the nineteenth century could not do: move information, and with it office work, to where the people are. The tools to do so are already here: the telephone, two-way video, electronic mail, the fax machine, the personal computer, and so on.

Peter F. Drucker, 1989

Remote Work is Shock to CRE Office Value

- **Research Question:** How to value commercial office buildings given disruptions from remote work?
  - Total commercial real estate value: $4.7 trillion in 2019, office is a large component. NYC: city assessment of $172 billion in commercial office.
  - Using market prices capitalized into some listed assets allows us to learn about the persistence of remote work
  - Extrapolating to larger universe of unlisted CRE assets bypasses illiquidity and informs discussion on impact on urban life and municipal finances

Remote Work is Shock to CRE Office Value

- **Research Question:** How to value commercial office buildings given disruptions from remote work?

1. Document Shifts in CRE Office Demand
   - Large declines in rent revenue in 2019–2021, driven by huge drop in *new* leasing activity
   - Flight to quality: younger, more expensive buildings have seen smaller declines
   - Older, lower quality buildings more likely to become “stranded assets”
   - Remote/hybrid work policies appear to drive these trends

Remote Work is Shock to CRE Office Value

- **Research Question:** How to value commercial office buildings given disruptions from remote work?

1. Document Shifts in CRE Office Demand

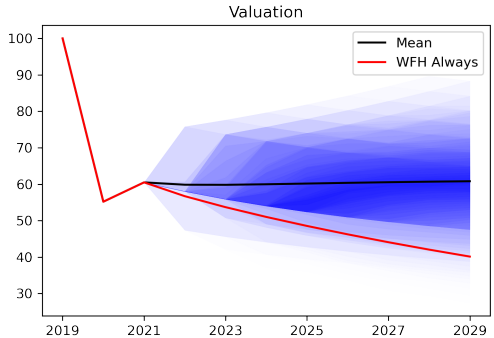
2. Assess Impact of Remote Work on Value of Office Shock
   - Develop novel asset pricing model to value buildings
   - Use leasing and REIT data to discipline calibration
   - WFH risk affects both future cash flows and discount rates

Remote Work is Shock to CRE Office Value

- **Research Question:** How to value commercial office buildings given disruptions from remote work?

1. Document Shifts in CRE Office Demand
2. Assess Impact of Remote Work on Value of Office Shock

Main Result: NYC Office values fall 44.80% in 2020 and 39.18% by 2029



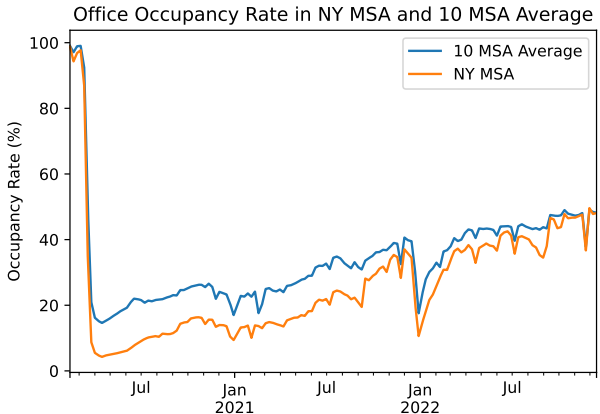
1. Trends in Office Use

Large Post-Pandemic Shifts

Actual Office Use

subway NYC Partnership NYC

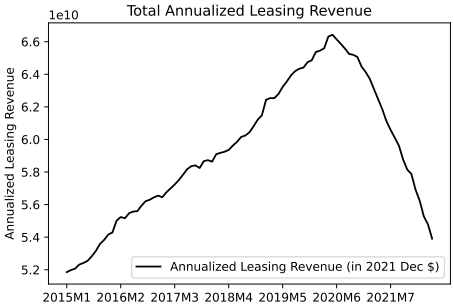
- Kastle turnstile data on physical office, now stabilizing
- At 48.2% of pre-covid levels on December 14, 2022 (48.1% in NYC)

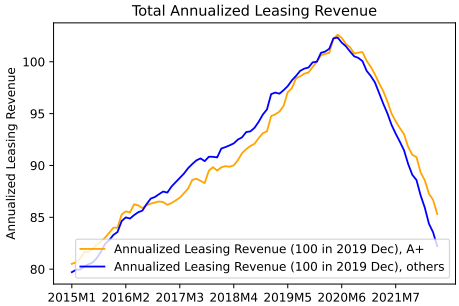


Leasing Revenues on Active Leases

Rent Quantity

- CompStak data, comprehensive coverage after 2015, 105 markets
- Lease revenues on in-force leases (excl. subleases) decline **16.89%** between December 2019 and May 22
- Smaller decline for A+ buildings (defined as the top-10% rent tier)

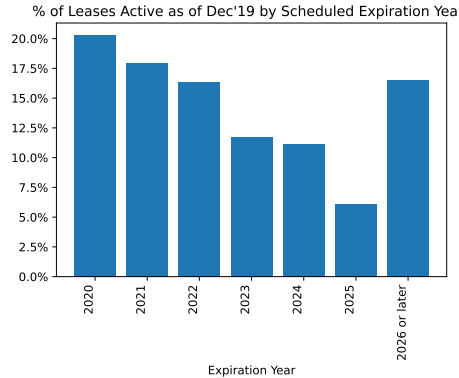


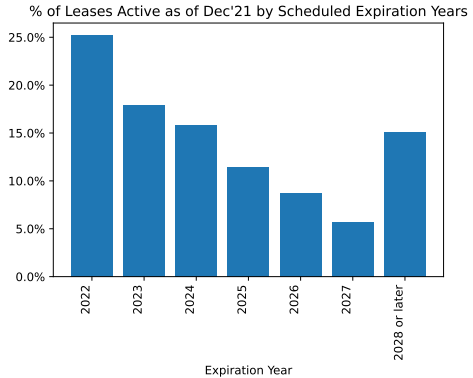


Staggered Lease Expiration

maturity

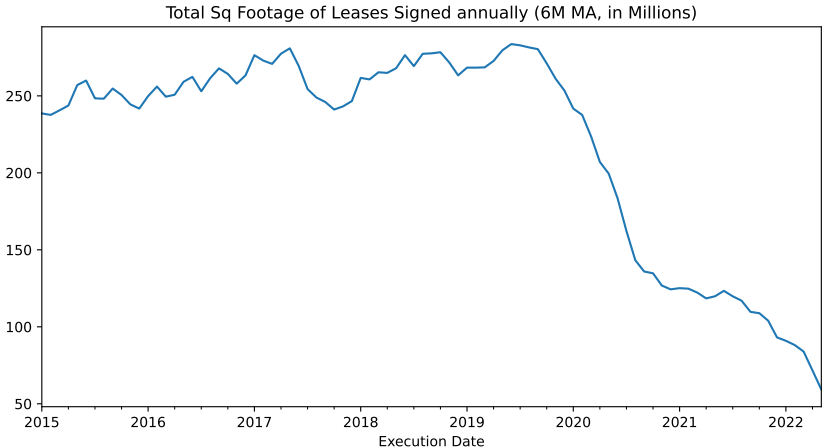
- Staggered lease expiration: only 38% of tenants had to make active space decisions in 2020 and 2021
- More short-term leases signed in 2020-21 $\Rightarrow$ addtl. lease expiration in 23-25





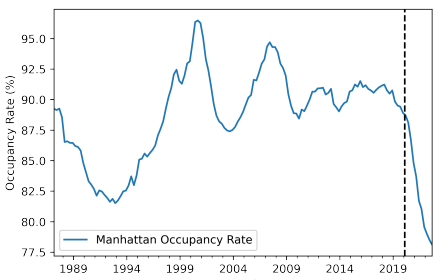
New Office Leases Signed - National

- **New** leasing activity has fallen off a cliff
- Drop from 253 mi sf in Dec 19 to 59 mi sf in May 22 per year: -76%

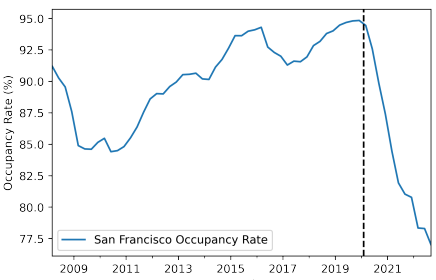


Manhattan/SF Contractual Occupancy

(a) Manhattan

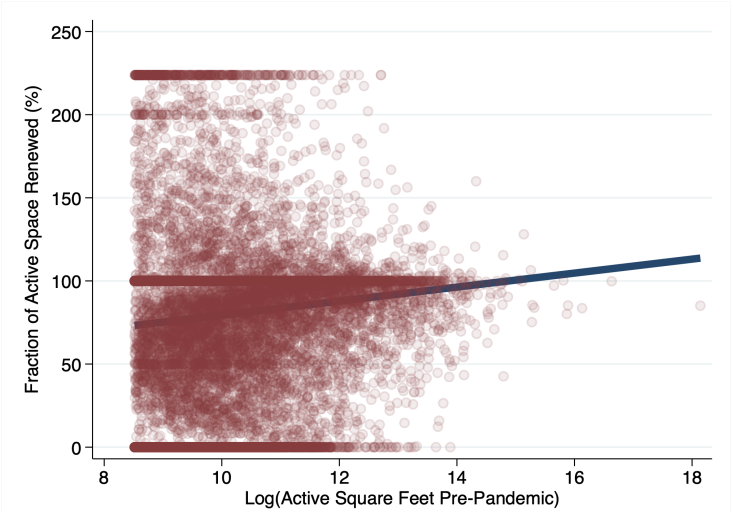


(b) San Francisco



Shifts in Office Demand at Tenant-Level

- Tenants, especially small tenants, have been reducing space demand
- Very large tech tenants temporarily helped to backstop market



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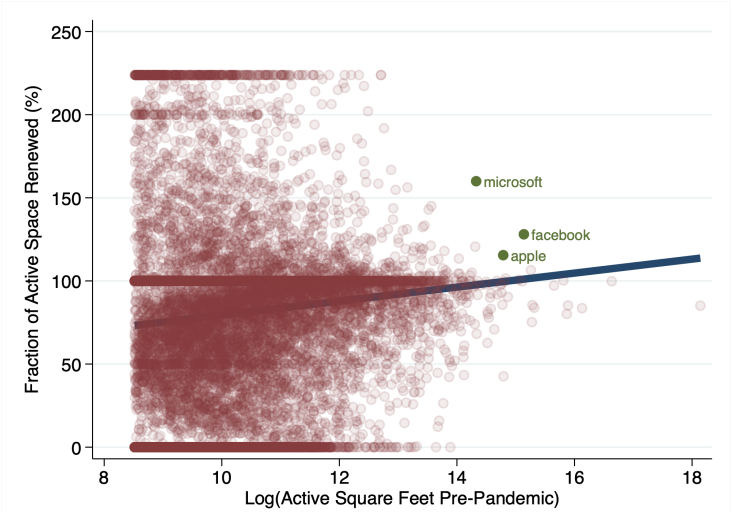
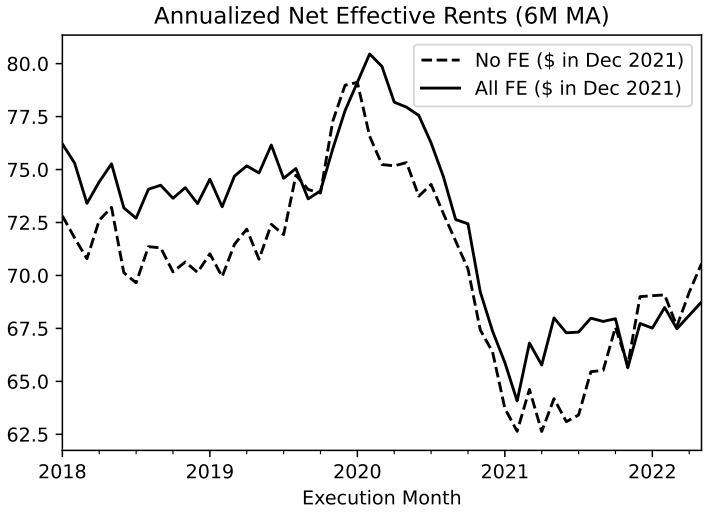


Net Effective Rent on New Leases - NYC National

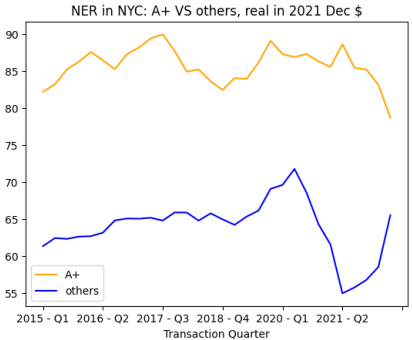
- NER declines by 15.94% in 2020 in NYC
- Much less of a recovery (with or w/o submarket FE)

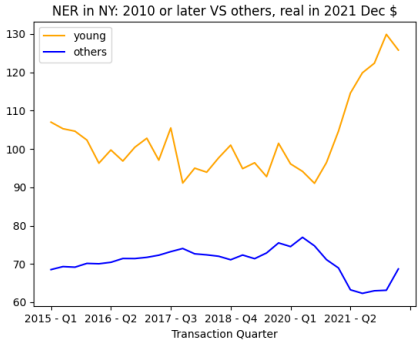


Flight to Quality in Rents – NYC

TX

- Left: A+ smaller drop than A-/B/C
- Right: Younger buildings see strong NER increase on new leases

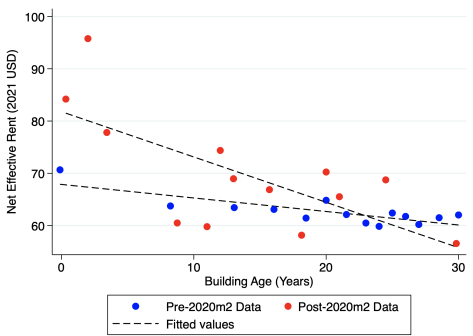




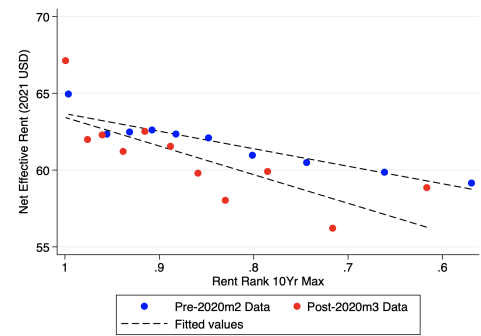
Flight to Quality in NYC + SF

Table

(a) Building Age Gradient



(b) Building Rent Rank Gradient



2. Remote Work and Office Demand

Office Use Shifts Due to Remote Work

Remote Work Associated with Lower Firm Space Demand

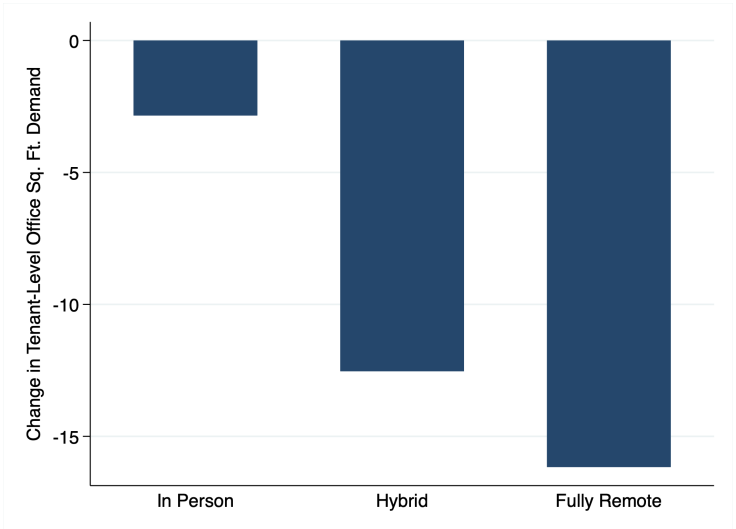
- Remote listings (Job Platform: Ladders) predicts lower tenant space demand
- Based on 135 of the largest tenants in our data set
- Firm with 10% of jobs fully remote $\rightarrow$ 3.9–4.9 pp decrease in space demand

	Δ Space	Δ Space	Δ Space
Remote Listings (3 months)	-0.392**		
	(-2.41)		
Remote Listings (12 months)		-0.492**	
		(-2.46)	
Remote Listings (24 months)			-0.468**
			(-2.01)
Constant	-0.0123	-0.0106	-0.0156
	(-0.61)	(-0.52)	(-0.77)
Observations	135	135	135
R^2	0.042	0.044	0.030

Hybrid Work and Office Demand

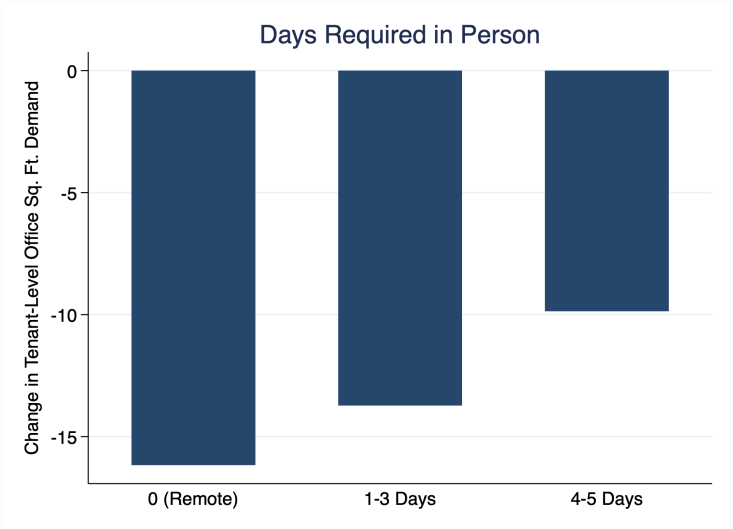
High Scheduled Expiration

- Classify back to work plans for 200 largest firms, connected to CompStak
- Hybrid and Fully Remote plans lead to substantially lower office demand



Hybrid Work and Office Demand

- Also measure days back in office
- Office demand scales by required in person attendance



3. Office Valuation Model

Estimation of Remote Work Shifts on Office Valuation

Office Value is Function of Cash Flows and Discount Rates

Value of a building (V) is expected present discounted ($M_{t,t+j}$) value of rent revenues (Rev_t) minus costs ($Cost_t$):

$$V_t = E_t \sum_{j=1}^{\infty} M_{t,t+j} \left(Rev_{t+j} - Cost_{t+j} \right) = E_t \sum_{j=1}^{\infty} M_{t,t+j} Rev_{t+j} - E_t \sum_{j=1}^{\infty} M_{t,t+j} Cost_{t+j}$$

- Revenues: rents on a portfolio of leases, of which fraction come due each period
  - Fraction $s^O(z)$ of expiring leases are renewed at the market rent (NER)
  - Fraction $s^V(z)$ of vacant space newly leased at the market rent (NER)
- Costs are divided into: variable, fixed, and broker commissions
- Revenues and Costs depend on aggregate state variable z

Modeling Economic States

- Need to model evolution of future state of economy z, uncertain
  - Business Cycle: Expansion (E) or Recession (R), calibrated to observed frequency and length of NBER recessions 1926–2019
  - WFH state with mass adoption of remote work
    - $\mathbf{q} = 5\%$, probability of entering WFH from no-WFH state
    - $\mathbf{p}$ probability of persisting in WFH, calibrated from REIT data
- Annual 4×4 state transition decomposed as:

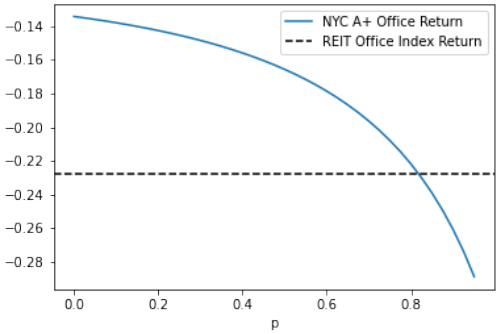
$$\pi(z'|z) = \pi^{BC}(z'|z) \otimes \pi^{WFH}(z'|z)$$

$$\pi_{BC} = \begin{array}{c} \\ E \\ R \end{array} \begin{array}{c} \begin{array}{cc} E & R \end{array} \\ \begin{bmatrix} 0.877 & 0.123 \\ 0.581 & 0.419 \end{bmatrix} \end{array}$$

$$\pi_{WFH} = \begin{array}{c} \\ \text{No WFH} \\ \text{WFH} \end{array} \begin{array}{c} \begin{array}{cc} \text{No WFH} & \text{WFH} \end{array} \\ \begin{bmatrix} 1-q & q \\ 1-p & p \end{bmatrix} \end{array} = \begin{array}{c} \\ \text{No WFH} \\ \text{WFH} \end{array} \begin{array}{c} \begin{array}{cc} \text{No WFH} & \text{WFH} \end{array} \\ \begin{bmatrix} 0.95 & 0.05 \\ 0.1824 & 0.8176 \end{bmatrix} \end{array}$$

Determining Persistence of Remote Work State **p** Robustness

- Matching realized return on NYC-centric REIT portfolio (Vornado, SLG, Empire State Trust) between Dec 2019-Dec 2020
- De-lever stock return to obtain asset return decline of 22.75%
- Recognize that this is the A+ market, not the overall NYC office market
- $\Rightarrow$ implies $p = 0.8176$
- WFH state is persistent; 24.77% chance that we are still in it in 2029



Modeling Discount Rates

- One-period discount rate decomposed into pre-WFH SDF and WFH shifter:

$$M(z'|z) = M^{BC}(z'|z) \otimes M^{WFH}(z'|z)$$

- $M^{BC}(z'|z)$ chosen to match risk-free rate and equity risk premium in each state $z = E, R$
- $M^{WFH}(z'|z)$ chosen to match cross-sectional exposure of office REIT returns to WFH equity factor (intuition: long Zoom, short Carnival)

Office Cash Flows for All NYC

Full A+

- Match lease duration of 7.40 years
- Market NER growth ϵ based on Compstak data Jan 2000–May 2022.
  - $\epsilon(E) > \epsilon(WFH - E) > \epsilon(R) > \epsilon(WFH - R)$

- Renewal rates pro-cyclical, chosen to match realistic vacancy rates
  - 10.5% in E, 16.0% in R, 27.7% in WFH-E, and 28.7% in WFH-R

Variable	Symbol	E	R	WFHE	WFHR
Market NER growth	ϵ	0.0544	-0.1251	0.0334	-0.1699
Supply growth	η	-0.0152	-0.0158	-0.0407	-0.0413
Lease renewal share	s^O	0.8259	0.2897	0.2748	0.0964
New leasing share	s^V	0.1160	0.3350	0.0612	0.1115

Office Cash Flows for All NYC

Full A+

- Match lease duration of 7.40 years
- Market NER growth ϵ based on Compstak data Jan 2000–May 2022.
- Supply: additions, based on observed construction year in Compstak, minus depreciation (2.70%)
  - $\eta(E) - \eta(WFHE) = \eta(R) - \eta(WFHR) = 2.55\%$
  - Consistent with stable long-run NOI growth
  - Captures reduced construction and conversions in WFH state
- Renewal rates pro-cyclical, chosen to match realistic vacancy rates
  - 10.5% in E, 16.0% in R, 27.7% in WFH-E, and 28.7% in WFH-R

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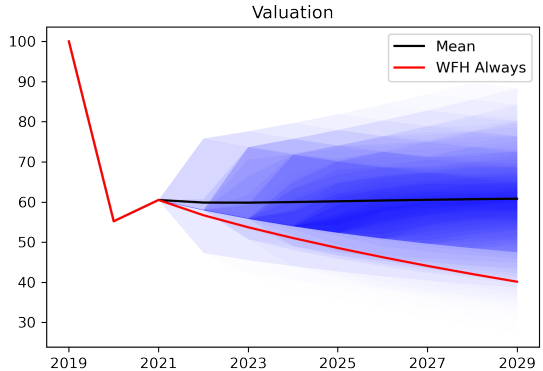
Office Values

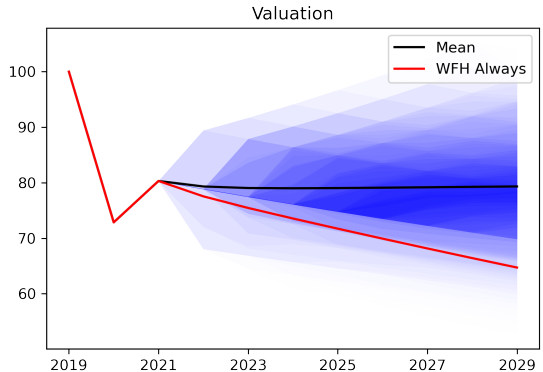
Other Results | Across Horizon

- Asset prices are forward looking
- Initial decline in 2020: 44.80% (A-/B/C initial decline: 68.98%)
- Long-run decline (by 2029): 39.18%; WFH until at least 2029: 59.86%
- Substantial range of estimates: **WFH risk**



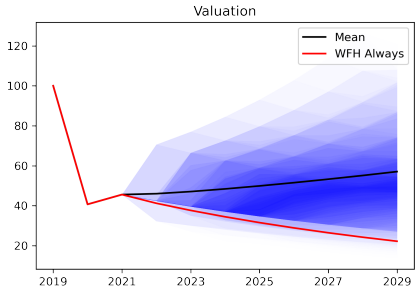
Office Values A+ Segment

- Initial decline in 2020: 27.13% (recall: matches REIT returns)
- Long-run decline (by 2029): 20.67%; WFH until at least 2029: 35.28%
- Stronger performance due to stronger rent growth in WFH state

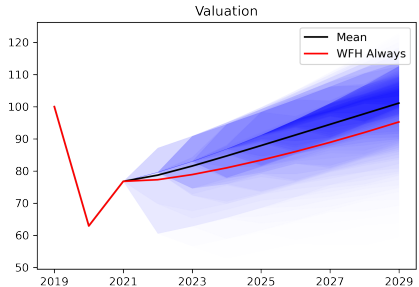


Valuation Shifts in SF and Austin

(a) San Francisco



(b) Austin



Valuation Shifts across the Country

State	Market	(1) Active SF (mi)	(2) Lease Rev Chg	(3) New SF Chg	(4) NER Chg	(5) Value Chg	(6) Coverage (%)	(7) Value Chg Scaled
NY	New York	287.36	-16.06	-53.94	-10.21	-47.52	73.58	-64.58
CA	San Francisco	61.25	-15.40	-69.26	-16.24	-14.61	62.14	-23.51
TX	Austin	26.60	-10.49	-89.05	5.17	-2.22	54.54	-4.07
DC	Washington DC	94.57	-23.52	-75.94	-12.67	-12.88	98.81	-13.03
CA	Los Angeles	74.32	-23.92	-86.21	-24.85	-9.44	42.83	-22.04
MA	Boston	55.51	-13.66	-76.63	-12.78	-7.07	35.33	-20.01
IL	Chicago	84.41	-15.81	-88.39	-5.21	-4.87	43.25	-11.26
TX	Dallas	47.54	-15.87	-85.21	3.40	-3.14	26.60	-11.80
CA	Orange County	38.47	-22.03	-60.55	-6.62	-3.27	47.36	-6.90
CA	San Diego	29.86	-15.95	-78.89	-15.58	-2.84	42.11	-6.74
VA	Arlington	26.99	-26.96	-85.91	-4.51	-3.29	36.10	-9.11
GA	Atlanta	37.25	-11.48	-84.11	-19.45	-2.47	31.33	-7.88
TX	Houston	42.11	-25.51	-58.87	-24.70	-3.20	28.63	-11.18
CA	San Jose	22.33	-16.45	-83.69	-13.55	-2.54	11.39	-22.30
CA	Palo Alto & Sunnyvale	13.93	5.33	18.38	-6.59	-1.33	36.10	-3.68
CO	Denver	29.82	-18.53	-79.08	-14.55	-1.97	29.78	-6.62
PA	Philadelphia	26.86	-20.08	-77.84	5.37	-1.88	23.24	-8.09
NC	Charlotte	22.98	-1.99	-82.65	-6.29	-1.18	47.54	-2.48
NJ	North Jersey	16.61	-11.36	-71.84	7.60	-1.33	18.29	-7.27
CA	Oakland	8.76	0.54	-80.66	-13.54	-0.76	9.01	-8.43
Top 20 (Compstak)		1047.56	-16.76	-71.86	-5.26	-127.82	41.26	-271.02
Other markets (Compstak)		772.17	-17.21	-81.92	7.99	-51.73	36.10	-143.31
U.S. (Compstak)		1819.73	-16.89	-76.59	2.45	-179.55	38.87	**-414.33**

Discussion Aggregate Impact

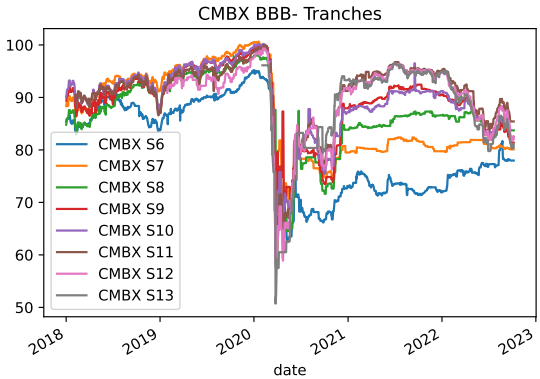
- Dollar Impact
  - CompStak data set has $17.76 bi in annual lease revenue for NYC office
  - Model implies value/lease revenue of 7.00 pre-pandemic
  - Implies $124.43 bi in value (lower than NYS estimate of $172 bi)
  - 39.18% long-term loss amounts to $48.75 bi
  - Scaling up nationally in CompStak data set: $178.01 bi
  - Scaling up for incomplete CompStak coverage (esp. outside NY): $413.44 bi
- Valuations lower if 2022–23 turns out to be a recession (WFH-R)
- Impact on urban retail Retail leases

Broader Ramifications: Conversions

- Upgrade from A-/B/C to A+ office; TI eat into NER
- To alternative use, esp. multifamily
  - Challenges: zoning, physical feasibility, cost/profitability
  - Easier for older office product (A-/B/C) which is hit harder
  - Some anecdotal evidence that this is starting (e.g., 55 Broad Str in NYC)
  - Transition process could take decades
- Govt may want to subsidize conversions given negative externalities from empty offices

Broader Ramifications: For Lenders

- If correct, a 40% average value correction would impair some CRE loans
- Any evidence for this in debt markets?
- CMBX BBB- tranche prices: series 10-13 have 31% office concentration vs. series 7 has only 18% office



Broader Ramifications: For Lenders

Table 6: Ranking banks based on their Real Estate exposure

	All banks		AUM $\geq$ 100 Mio.		AUM $\geq$ 1 Bio.		All banks	
	Bank	(%)	Bank	(%)	Bank	(%)	Bank	($bio)
1	China Citic Intl LA	97	China Citic Intl LA	97	Shanghai CMRL NY	89	Deutsche BK NY	13.6
2	CMB Wing Lung SF	93	Shanghai CMRL NY	89	Bank of China LA	54	E Trade BK	12.8
3	Shanghai CMRL NY	89	Shanghai CMRL LA	76	Bank of E Asia LA	50	UBS BK USA	5.2
4	Shanghai CMRL LA	76	Bank E Asia NY WS	73	United Overseas NY	48	Bank of China NY	4.5
5	Bank E Asia NY WS	73	Shanghai CMRL SF	69	United Overseas LA	41	Landesbank H-Th NY	4.5
6	Shanghai CMRL SF	69	CMB Wing Lung LA	67	Landesbank H-Th NY	39	BOKF NA	4.3
7	CMB Wing Lung LA	67	Bank of Guam SF	64	Oversea-Chinese LA	31	Landesbk BW NY	3.8
8	Bank of Guam SF	64	Bank of China LA	54	Land BK of Taiwan LA	29	Hancock Whitney	3.6
9	Bank of China LA	54	Mega Intl Cmrl SV	50	Bank of China CH	28	First-Citizens B&TC	3.4
10	Mega Intl Cmrl SV	50	Bank of E Asia LA	50	Nano Banc	23	Bankunited	3.2

Note: Real estate exposure (%) includes CMBS and real estate lending and is scaled by total assets.
Source: Authors' calculations based on bank call report data as of 2021Q2.

Broader Ramifications: City Doom Loop

- The urban CBD (office and nearby retail) has historically sustained urban public finances through property tax, tenant rent tax, and income tax revenue
- Reduction in tax revenue would require either spending cuts to local public amenities (transportation, education, police, etc.) or increases in taxes
- Federal aid during pandemic years plugged the hole, but Federal largesse unlikely to continue (NYC faces $10bn deficit, NYT Sept 19, 2022)
- The local fiscal dynamics may propagate net out-migration
- In WFH world, migration elasticity to tax rates/spending cuts may be larger

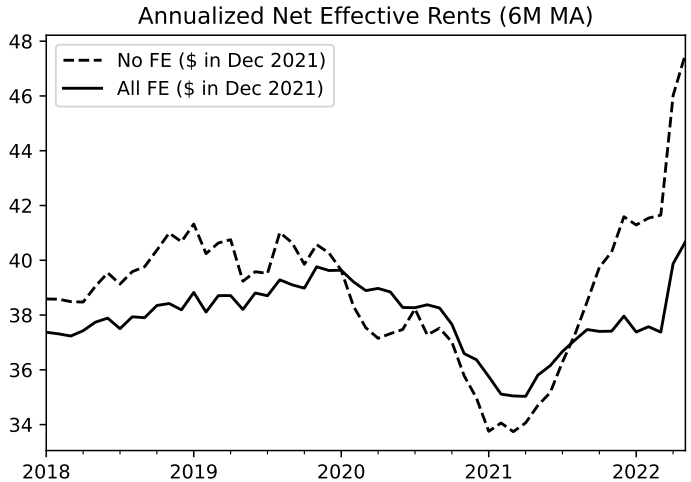
Appendix

Backup material

Net Effective Rent on New Leases - National

Back

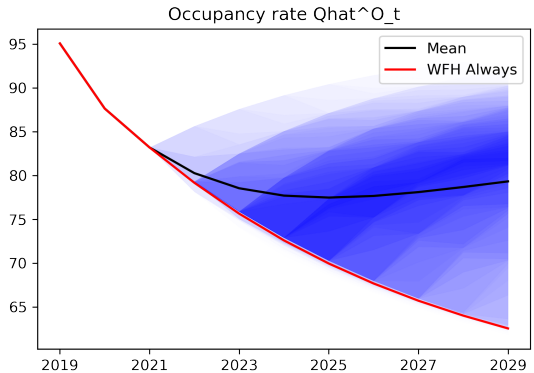
- NER declines by 13.16% in 2020
- Rebound in 2021-22 on low and positively selected volume (dashed)
- Some of the decline and much of the rebound is composition effect (solid)



Main Results: Office Occupancy Rate

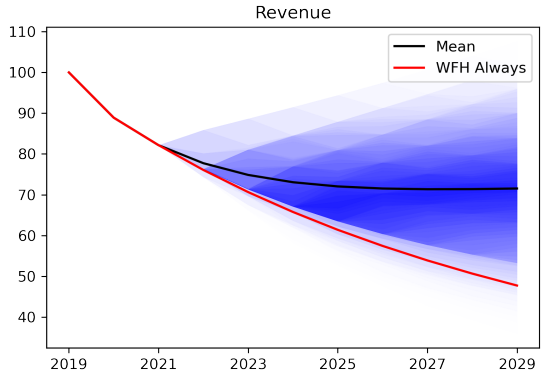
Back

- Simulate model from 2019 (E) to 2020 (WFH-R) to 2021 (WHF-E) and stochastic evolution in 2022-29
- Since future is uncertain, simulate many sample paths (fan charts)
- Black line: average path, Red line: still in WFH state in 2029



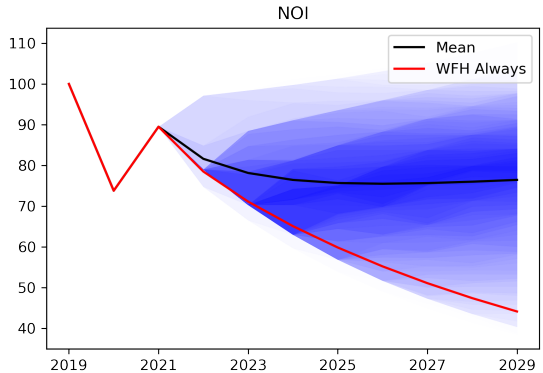
Main Results: Rent Revenues

- Revenues normalized to 100 in 2019
- Slow lease expiration: revenues only slowly reflect decline in underlying market rent



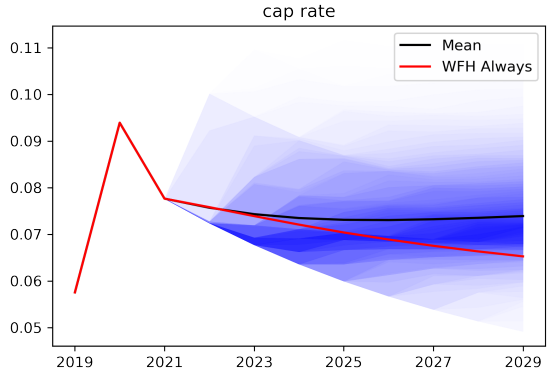
Main Results: NOI

- NOI normalized to 100 in 2019
- Revenue decline partially offset by cost decline (lower occupancy)



Main Results: Cap Rates

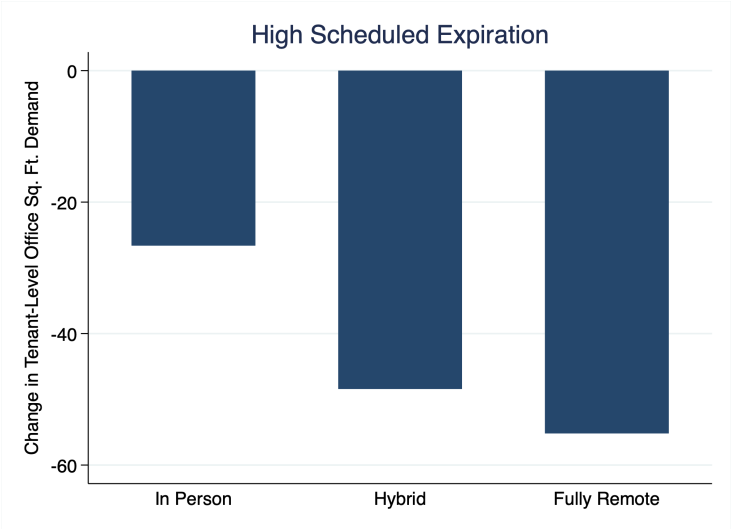
- Cap rates low in 2019 after long boom
- Cap rates shoot up and remain elevated along average path



Hybrid Work and Office Demand — High Scheduled Expiration

Back

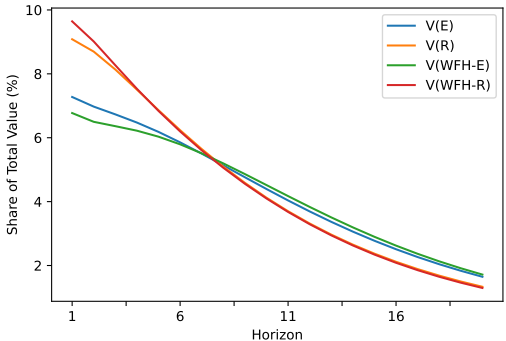
- Classify back to work plans for 200 largest firms, connected to CompStak
- Hybrid and Fully Remote plans lead to substantially lower office demand



Decomposing Office Values by Horizon

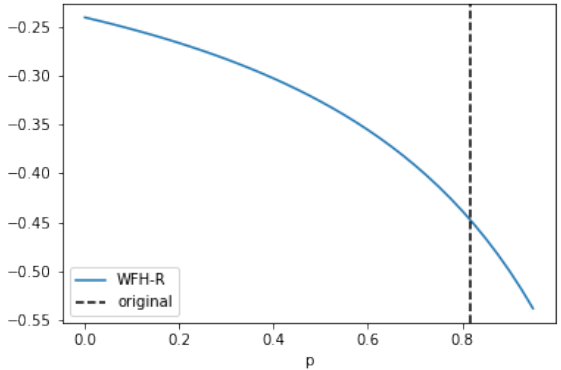
Back

- Total share of office value decomposed into first 20 years (strips) by state
- Share of short-term cash flows rises from 2019 (E) to 2020 (WFH-R)
  - Contrast with equities: Short-term cash flow share falls in recessions (2001) or stays flat (2008) (Binsbergen, Brandt and Koijen, 12)
- Leases are locked in near-term, but will reset at lower market rents in the future



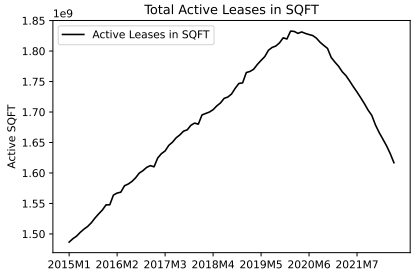
Change in Valuation with Different **p** for NYC All

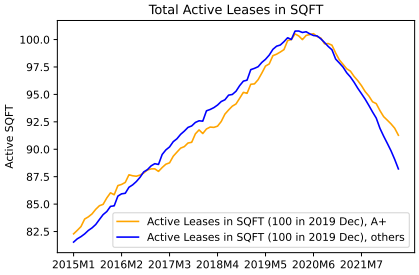
Back



Pandemic Decline in Quantity of In-force Contracts

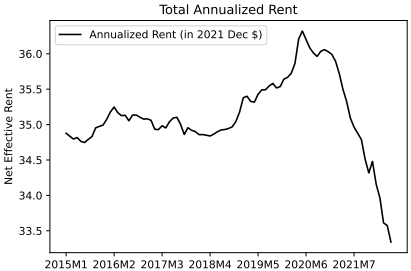
Back

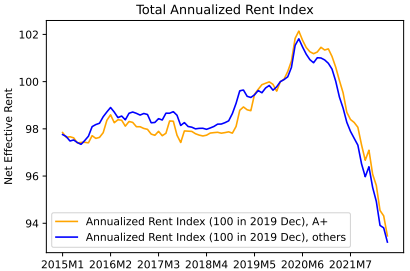




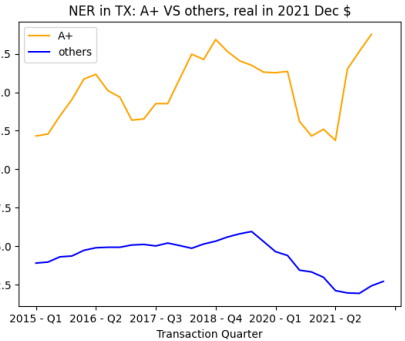
Average Rent on Active Leases

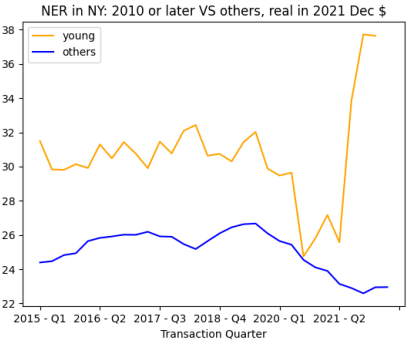
Back





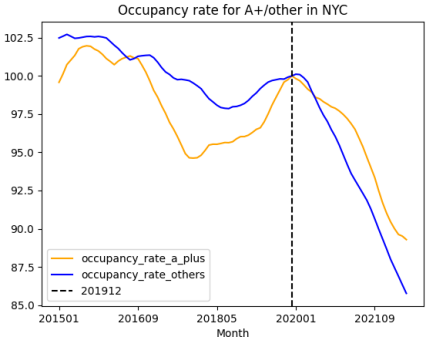
Flight to Quality in Office Rents (TX) Back

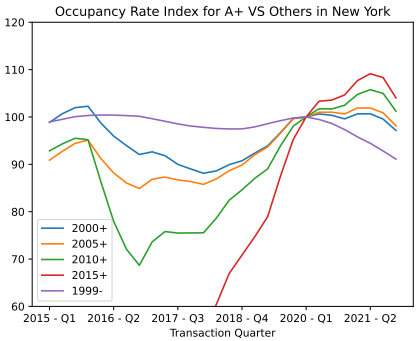




Flight to Quality: NYC Office Occupancy Rate

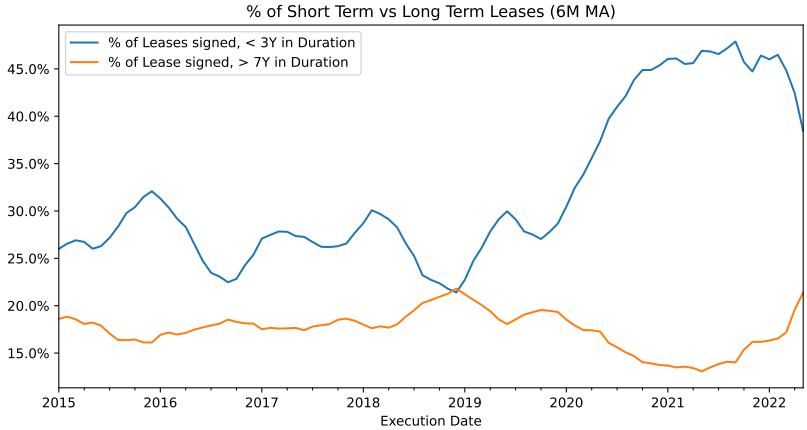
Back





Maturity of New Leases

Back



Calibrating Model

Variable	Symbol	E	R	WFHE	WFHR
Market NER growth	ϵ	0.0544	-0.1251	0.0334	-0.1699
Supply growth	η	-0.0152	-0.0158	-0.0407	-0.0413
Lease renewal share	s^O	0.8259	0.2897	0.2748	0.0964
New leasing share	s^V	0.1838	0.3350	0.0612	0.1115
Fixed cost/rent ratio	c^{fix}	0.2000	0.2000	0.2000	0.2000
Variable cost/rent ratio	c^{var}	0.2300	0.2300	0.2300	0.2300
Leasing commission new	LC^N	0.3000	0.3000	0.2400	0.2400
Leasing commission renewals	LC^R	0.1500	0.1500	0.1200	0.1200

Cash Flows for NYC A+ Buildings back

- Similar procedure for A+ (top 10% of most expensive signed leases)
- Slightly longer lease duration (8.2034 years, $\chi = 0.1219$)
- Reflects "flight to quality": better demand in WFH state

Table: Calibration for NYC A+

Variable	Symbol	E	R	WFHE	WFHR
Market NER growth	ϵ	0.0482	-0.1212	0.0272	-0.0472
Supply growth	η	-0.0155	-0.0081	-0.0410	-0.0336
Lease renewal share	s^O	0.8432	0.5668	0.5361	0.3604
New leasing share	s^V	0.1160	0.1893	0.0738	0.1204

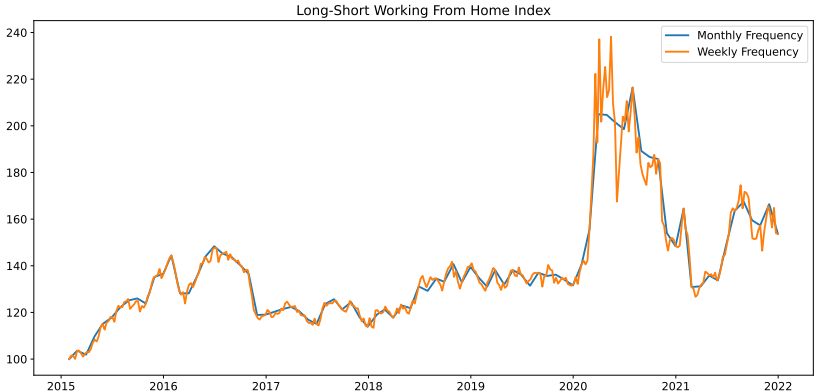
Model Solution for NYC All Calibration

Statistic	Uncond	E	R	WFHE	WFHR
R_f	0.0149	0.0084	0.0467	0.0084	0.0467
Equity $\mathbb{E}[Ret] - 1$	0.0955	0.0773	0.1846	0.0746	0.1815
Equity RP = $\mathbb{E}[Ret] - 1 - R_f$	0.0806	0.0690	0.1379	0.0662	0.1348
Cap rate	0.0774	0.0745	0.0973	0.0676	0.0999
Office $\mathbb{E}[Ret] - 1$	0.0770	0.0603	0.1484	0.0684	0.1455
Office RP = $\mathbb{E}[Ret] - 1 - R_f$	0.0621	0.0519	0.1016	0.0600	0.0987
$\mathbb{E}[g_t]$	-0.0007	-0.0186	0.1256	-0.0565	0.1102
Vacancy rate $= 1 - \widehat{Q}^O$	0.1500	0.1053	0.1600	0.2768	0.2865
$\widehat{\text{Rev}}$	0.7876	0.7995	0.9067	0.6479	0.8087
$\widehat{\text{Cost}}$	0.4138	0.4259	0.4141	0.3777	0.3755
$\widehat{\text{NOI}} = \widehat{\text{Rev}} - \widehat{\text{Cost}}$	0.3738	0.3735	0.4926	0.2702	0.4331
$\widehat{V}^R$	8.4713	8.9948	8.1383	7.1768	6.7796
$\widehat{V}^C$	3.7269	4.0427	3.1483	3.2731	2.5389
$\widehat{V} = \widehat{V}^R - \widehat{V}^C$	4.7444	4.9521	4.9901	3.9037	4.2407

Construction WFH Factor

Back

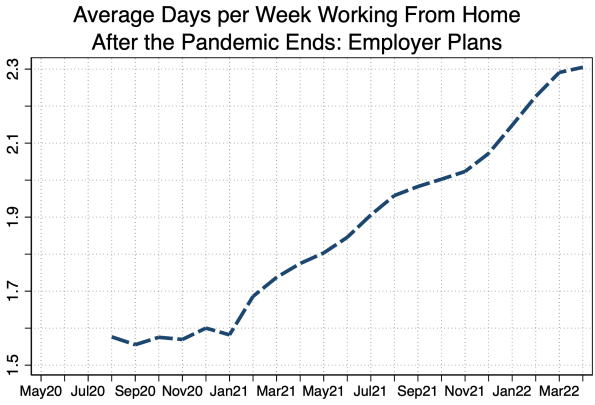
- Rebalanced monthly index which goes long (Pfizer, Zoom, Peloton) and short (United, Carnival, Marriott)



Employer Views on Remote Work Shifting

back

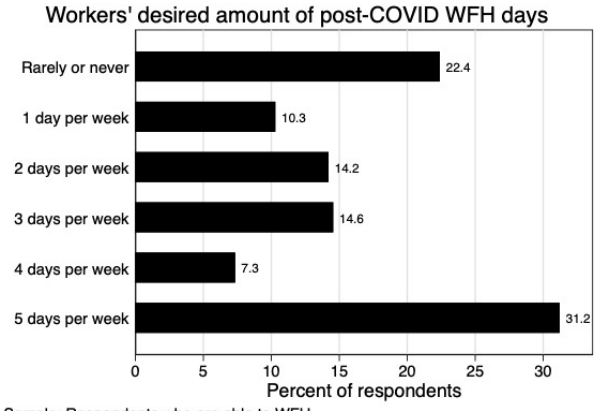
- Employers now expect 2.3 days of remote work “after pandemic is over"
- Revised beliefs about productivity of WFH or tight labor market?



Employees Like Working From Home

back

- More than half of employees wants to WFH 3 or more days per week
- Desires are stronger among higher-income/skilled employees

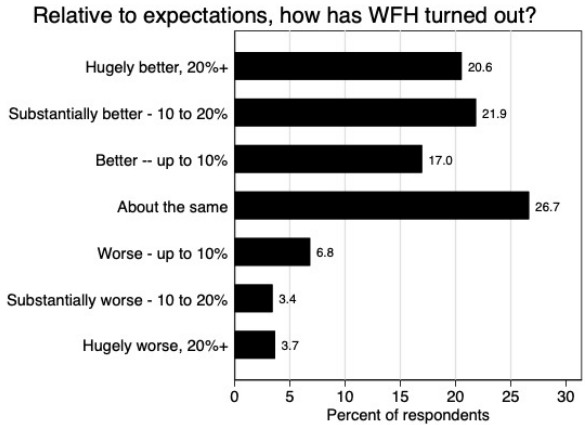


Sample: Respondents who are able to WFH

WFH Experience Perceived Positively by Employees

back

- Desire to work remotely fueled by positive experience with it



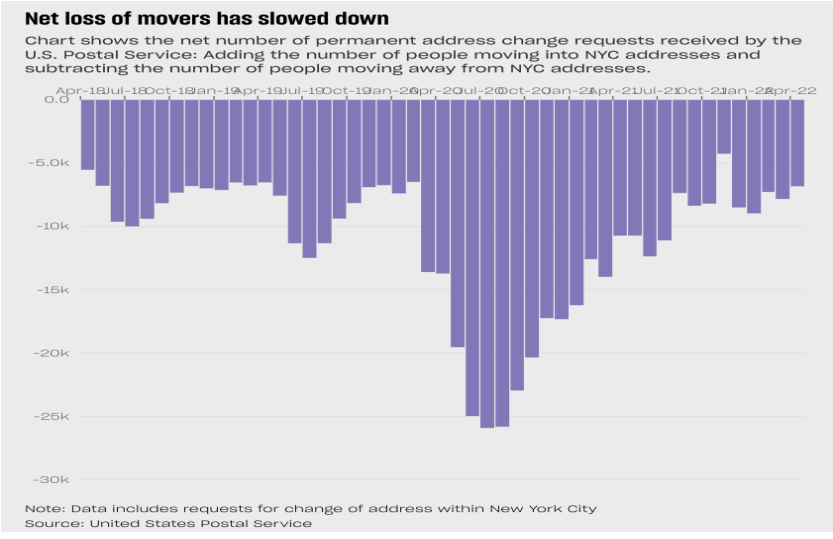
Impact of Remote Work on Productivity?

- Positive productivity effects from WFH:
  - Call centers: Bloom et al. (2015, 2022), Harrington and Emanuel (2021)—positive productivity effects, but historically negative selection
  - Choudhury et al. (2020): 4.4% increase in patent examiners productivity after remote option
  - Chen, Frey, Presidente (2022): Effect of remote collaboration on breakthrough discovery becomes positive in 2010s

- Negative consequences of remote work:
  - Atkin, Chen, Popov (2022): face-to-face interactions result in more patent citations
  - Catalini (2018): Labs more likely to collaborate after random shock results in colocation, but disruption does not decrease collaboration
    - Proximity particularly important for *starting* collaboration
  - Lin, Frey, Wu (2022), Yang et al. (Microsoft, 2022): short-run increase in productivity, but long-term teams more "siloed" and less synchronous communication
  - Gibbs et al. (2021): hours worked ↑, output ↓, productivity ↓ 8-19%
  - Roche, Oettl, Catalini (2022): Startups more likely to adopt technology used by randomly allocated proximate peers

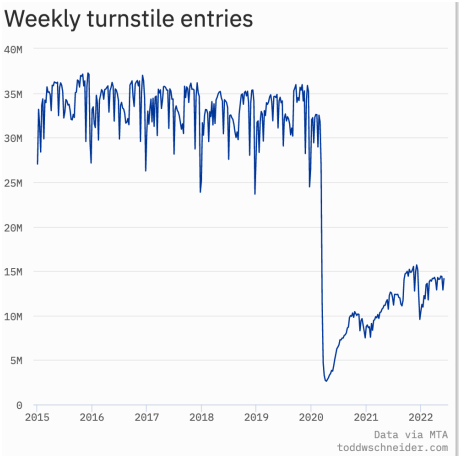
Population Changes

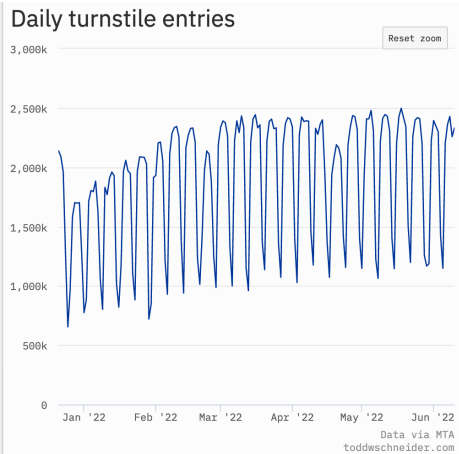
- NYC population losses have shrunk but not reversed (USPS)



Sluggish Transit Recovery

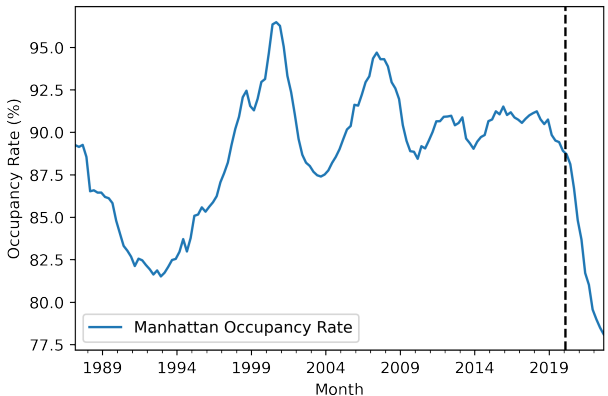
back





Manhattan Contractual Occupancy

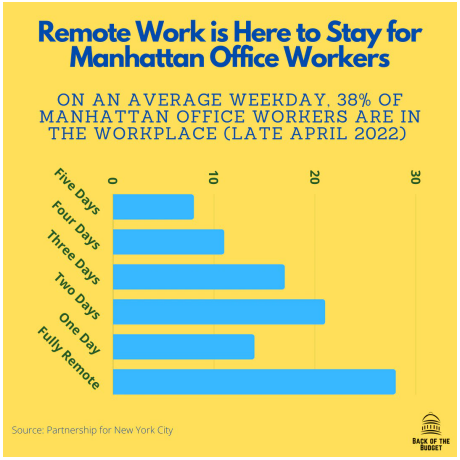
back



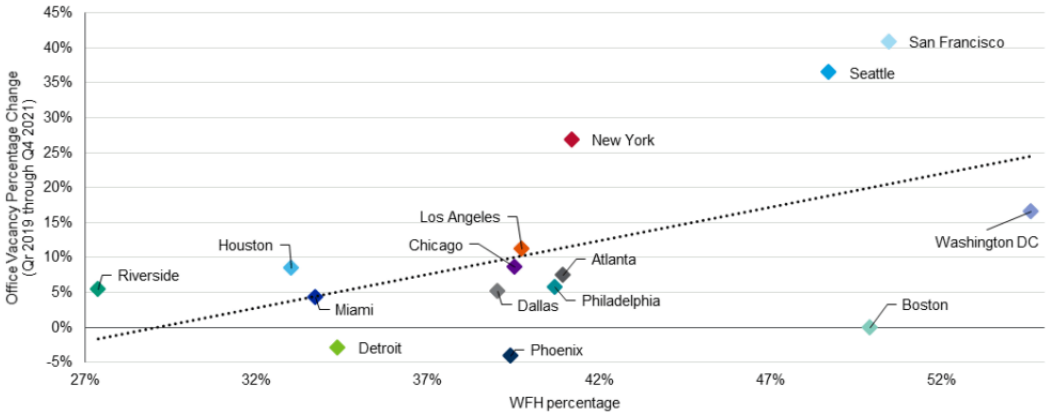
Manhattan Office Workers in Office

back

- Survey evidence by Partnership for NYC in April 2022
- On average day, 38% of workers in office
- Only about 20% of workers are in office 4 or 5 days/week



Cities with More WFH Ability Saw Larger Increase in Office Vacancy



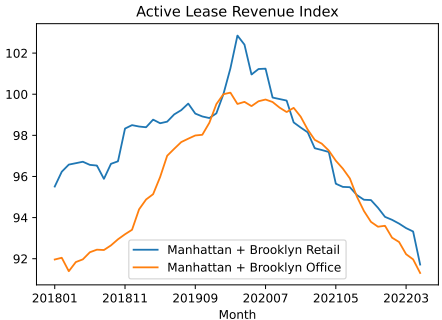
Source: Moody's

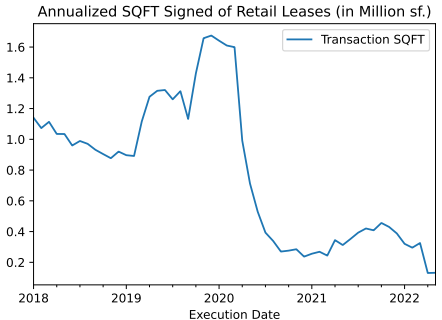
back

Pandemic Decline in NYC Retail Leasing

Back

- Active leasing revenue declines similarly to office (Jan 20 = 100)
- Large decline in new leasing volume (but sparse data coverage)





Building Quality and Rent

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Building Age (Yrs)	-0.101***	-0.070***	-0.067**	-0.083***		-0.088***	-0.066**
	(0.015)	(0.011)	(0.030)	(0.015)		(0.016)	(0.014)
Building Age ×				-0.042***		-0.005	-0.001
Post Pandemic				(0.013)		(0.011)	(0.011)
Log Building Age					-0.084***		
					(0.007)		
Log Building Age ×					-0.024***		
Post Pandemic					(0.008)		
Age × Post ×						-0.044***	-0.020*
Major Market						(0.011)	(0.009)
Month FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Submarket FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Tenant FE	No	Yes	Yes	No	No	No	Yes
Building FE	No	No	Yes	No	No	No	No