

Work from Home and the Office Real Estate Apocalypse

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Summary / Overall Assessment

15% decline in lease revenue on office property nationwide

- ▶ This seems quantitatively about right to me, mostly driven by declines in real rents
- ▶ Paper focuses on NYC but mostly extrapolates to rest of US

Huge decline in office property values driven largely by changes in the discount rate

- ▶ Felt like a black box to me
- ▶ Inconsistent with REIT valuations of office so has to be a **big** disconnect between class A and the rest of office

Bigger declines in space usage by firms with more lenient WFH policies

- ▶ This also seems right to me but need to identify the production function with WFH
- ▶ How much does shifting from 90% of days worked in the office to 60% reduce total square footage?

The Decline in Real Office Rents is Real and Widespread

Using same data source as GMVN, Davis et al. (2024a) find 12-14% decline in real effective rents psf nationwide, 2019-2022

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
postwfhboon	-0.12***	-0.13***	-0.12***	-0.13***	-0.11***	-0.13***	-0.14***
	-0.0073	-0.0069	-0.0079	-0.0087	-0.018	-0.0085	-0.012
transactionsqft	2.6e-07***	2.2e-07***	2.5e-07***	3.9e-07**	0.00000021	2.8e-07***	0.00000008
	-0.0000001	-0.0000001	-0.0000001	-0.000002	-0.0000002	-0.0000001	-0.0000001
termdum1	-0.15***	-0.14***	-0.15***	-0.15***	-0.034	-0.19***	-0.057***
	-0.012	-0.011	-0.013	-0.014	-0.03	-0.014	-0.019
termdum2	-0.13***	-0.12***	-0.14***	-0.12***	-0.086***	-0.14***	-0.068***
	-0.011	-0.01	-0.012	-0.014	-0.026	-0.012	-0.02
termdum3	-0.088***	-0.083***	-0.092***	-0.061***	-0.078***	-0.091***	-0.048***
	-0.0093	-0.0087	-0.0097	-0.012	-0.021	-0.01	-0.018
Observations	8475	8381	6684	4242	1726	5870	2438
R ²	0.736	0.787	0.762	0.811	0.647	0.782	0.824
Building Class FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Renewal/New FEs	Yes	Yes	Yes	Yes	Yes	New	Renewals
Gross/Net FEs	Yes	Yes	Yes	Gross	Net	Yes	Yes
Cal Qtr FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CBSA FEs	Yes	No	Yes	No	No	No	No
Zip Code FEs	No	Yes	No	Yes	Yes	Yes	Yes
Tenant Industry FEs	No	No	Yes	No	No	No	No

Decline Only Slightly Worse in NYC than Rest of Country

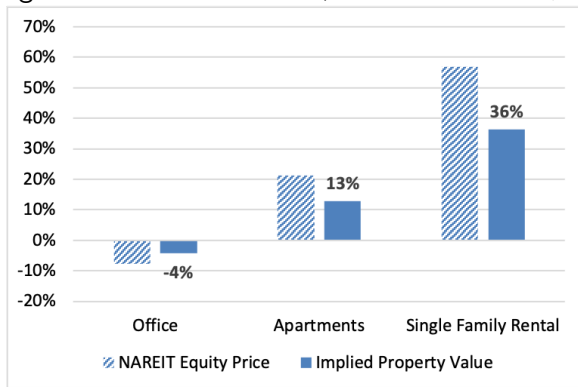
postwfhboon	-0.13*** (0.007)	-0.13*** (0.008)	-0.14*** (0.015)
transactionsqft	2.2e-07*** (7.2e-08)	3.0e-07*** (1.1e-07)	5.6e-08 (1.1e-07)
termdum1	-0.14*** (0.011)	-0.13*** (0.013)	-0.16*** (0.023)
termdum2	-0.12*** (0.010)	-0.11*** (0.012)	-0.12*** (0.021)
termdum3	-0.083*** (0.0087)	-0.071*** (0.010)	-0.096*** (0.016)
Observations	8,381	6,645	1,734
R^2	0.787	0.776	0.377
City	National	All ex NYC	NYC Metro
Building Class FEs	Yes	Yes	Yes
Renewal/New FEs	Yes	Yes	Yes
Gross/Net FEs	Yes	Yes	Yes
Cal Qtr FEs	Yes	Yes	Yes
Zip Code FEs	Yes	Yes	Yes

13% decline in top 30 US cities vs. 14% in NYC

46% Decline in Prices is Mostly from Discount Rates

Must be driven by properties dissimilar to those owned by REITs

Change in REIT Prices Jan. 1, 2020 to **Dec. 31, 2021**



Source: Davis et al. (2024b)

NB: Fed starts increasing interest rates in 2022Q2.. So above valuations don't reflect changes in aggregate discount rates

Most of Decline in Prices is from Changes in Discount Rate

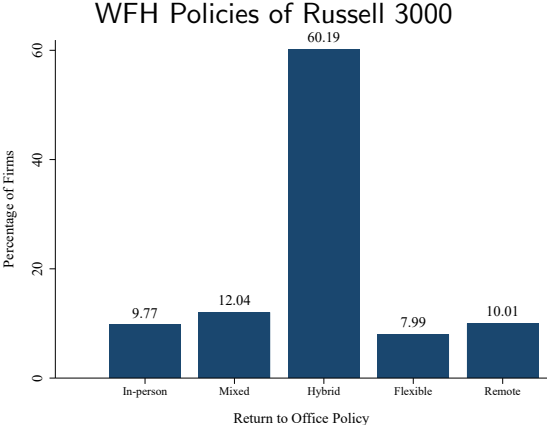
Decline in real rents is quite precise

Why did investors jack up the discount rate by so much?

1. Aggregate rise in discount rates? If this is it, why not write a series of papers called, e.g., “The Stock Market Apocalypse”, “The Muni Bond Apocalypse”, etc...?
2. Uncertainty about what WFH policies will be?
3. **Uncertainty about production functions - how much capital do you need for WFH vs. work at the office**

Uncertainty about what WFH policies will be?

I don't think so... Most sources suggest 100% remote is mostly IT, norm is hybrid with 2-3 days per week in office, 4 in financial sector

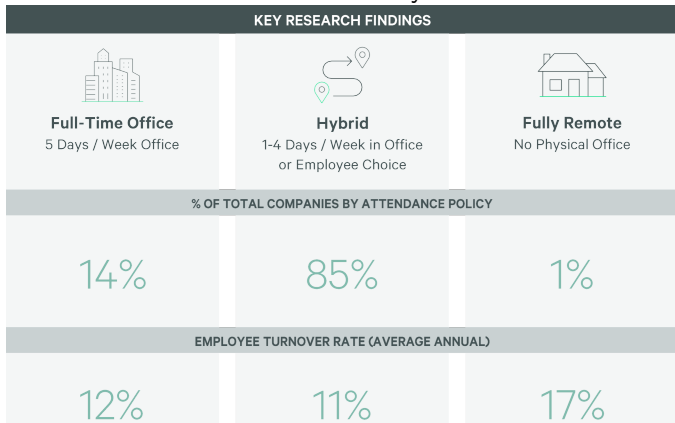


Source: Flynn et al. (2024)

And 100% remote policies are among smaller companies

Uncertainty about what WFH policies will be?

CBRE Tenant Survey Results



Source: CBRE Consulting (2024)

Very similar share of fully in-person policies to to Flynn et al. (2024),
much less fully remote since surveying office tenants

Uncertainty About Production Functions

Long history of modeling capital in the production function with Cobb-Douglas

- ▶ Consistent with balanced growth path (Jones, 2005)

Tradition suggests production functions should be

$$y^o = A^o (l^o)^\theta (k^o)^{1-\theta}$$
$$y^h = A^h (l^h)^\theta (k^h)^{1-\theta}$$

where l^o and l^h are days worked at the office and home, k^o and k^h are office space at the office and at home

Eberly et al. (2022) argues that θ roughly the same for WFH and work at the office suggesting this remains correct

Uncertainty About Production Functions

$$y^o = A^o (l^o)^\theta (k^o)^{1-\theta}$$
$$y^h = A^h (l^h)^\theta (k^h)^{1-\theta}$$

These production functions generate quantitatively realistic changes in office and residential prices (Davis et al., 2024a)

But unclear that going from 90%+ of days worked in the office to 50-60% (rough consensus) decreases office space needs per employee by 40%

Utah Data Suggests Not Cobb-Douglas...

Financially Occupied Office Square Feet per Office Using Employee
(NAICS sectors)

	2018	2019	2020	2021	2022	2023	2024
Financially Occ. SF (Mil)	40.7	41.3	43.3	43.6	44.0	42.6	43.0
Office Using Employ. (1000s)	266	275	274	293	307	306	307
Office SF / Office Worker	153	150	158	149	143	139	140

Source: CBRE and Ivory-Boyer Real Estate Center calculations

Unless Utah is very unrepresentative, should have seen much steeper drops in capital per employee if we went from 10% of days WFH to 40% of days WFH...

- ▶ Cobb-Douglas suggests ≈ 90 SF per employee in 2024!
- ▶ Utah data on WFH suggests increases in WFH pre- to post-pandemic similar to US

Uncertainty About Production Functions

Getting production functions right is important for figuring out office market

And National Income and Product Accounting! How much of residential stock should be allocating to production vs. consumption?

- ▶ Matters tremendously for measuring TFP

Conclusions

Decline in real office rents is significant and caused by increase in WFH

Biggest open question affecting discount rate is how much hybrid work reduces office space needs per employee

CBRE CONSULTING (2024): “U.S. Office Policy Landscape: Office Policy Attendance Insights,” Tech. rep., CBRE.

DAVIS, M. A., A. C. GHENT, AND J. GREGORY (2024a): “Winners and Losers from the Work-from-Home Technology Boon,” Tech. rep., Rutgers University.

——— (2024b): “The Work-from-Home Technology Boon and its Consequences,” *Review of Economic Studies*, 91, 3362–3401.

EBERLY, J., J. HASKEL, AND P. MIZEN (2022): ““Potential Capital”, Working From Home and Economic Resilience,” Tech. rep., Northwestern University.

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