Residential and Commercial Real Estate During the Pandemic

Stijn Van Nieuwerburgh

Columbia Business School

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The Pandemic and Real Estate Markets

- The covid-19 pandemic is one of the most profound shocks to hit real estate markets in our lifetimes
- The pandemic
  - Caused urban-to-suburban migration
  - Changed residential rents and prices
  - Disrupted cash flows on income-producing property
  - Increased risk premia
  - Reduced liquidity: low transaction volumes, low leasing activity
- While some of these changes have faded as the virus has been brought under control and the economy has rebounded, other changes will be permanent, bringing about a **New Normal**
  - working from home
  - e-commerce
- Different real estate sectors affected very differently

Today's Talk

- Residential Real Estate
  - Evolution of urban and suburban house prices and rents in 2020
  - What can we learn from change in prices and rents about the future of the city?
  - What explains some of the differences in price and rent behavior across metropolitan areas? Getting at the underlying drivers. WFH!

Today's Talk

- Residential Real Estate
- Commercial Real Estate: Office
  - Facts on leasing activity and office rents
  - Understanding price evolution in private and public markets: cash flows or discount rates?

Today's Talk

- Residential Real Estate
- Commercial Real Estate: Office
- Speculation on future of cities

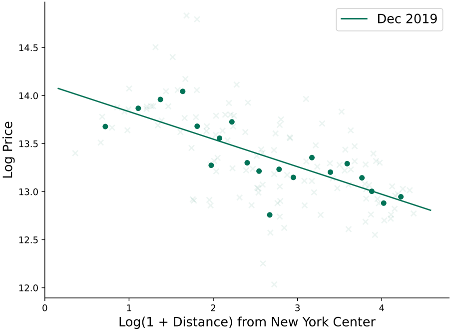
1. Residential Prices and Rents in Pandemic

Flattening The Curve (Gupta, Mittal, Peeters, and Van Nieuwerburgh, Journal of Financial Economics, 2021)

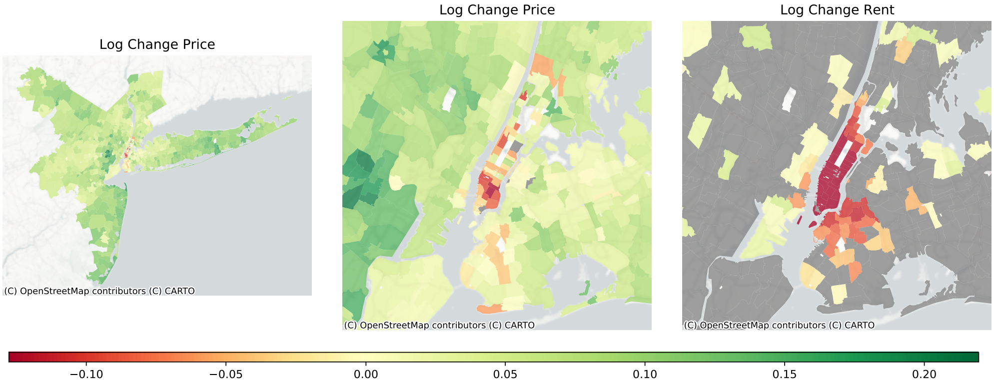
The Spatial Gradient in Residential Real Estate

- City centers are special
  - Productivity spillovers; benefits from agglomeration
  - Amenities: restaurants, culture, tolerance, singles
  - Shorter commutes - congestion and aging/subpar infrastructure worsening commutes from subburbs
- $\Rightarrow$ Urban core commands the highest rents and house prices
- Rents and prices fall as we get farther away from the urban core: the rent gradient is negative

Prices and Rents Pre-Pandemic New York

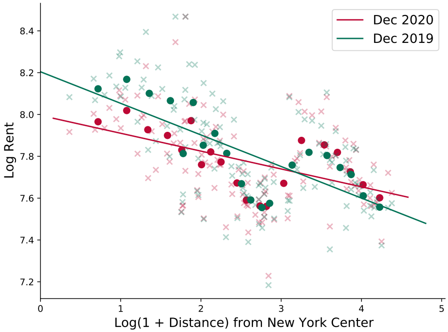


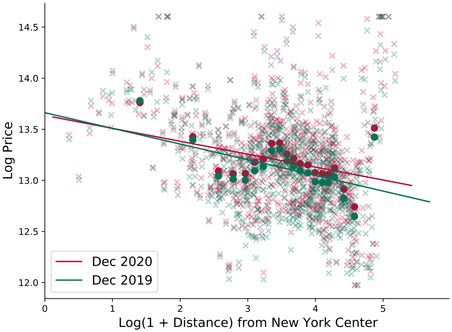
Rents and Prices in Pandemic New York



Flattening the Curve Rent and Price Changes

- Rents declined drastically in city centers. Grew strongly in suburbs.





Rent and Price Changes New York

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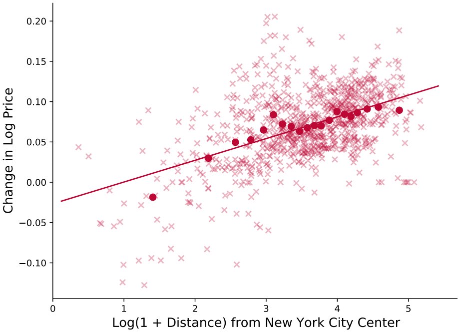
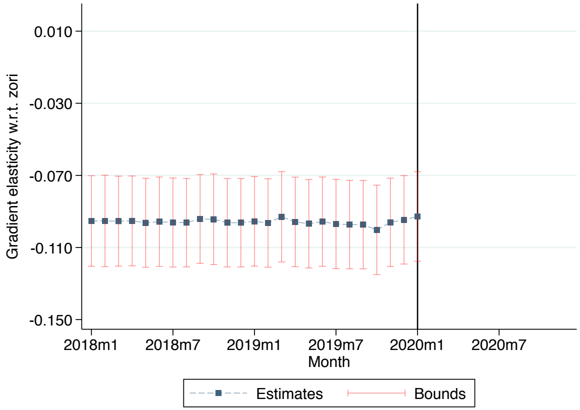


Reversal of Rent Gradient New York

$$\ln \mathrm{Rent}_{ijt} = \alpha_{jt} + \delta_{jt} \left[\ln(1 + D(\mathbf{z}_{ij}^{z}, \mathbf{z}_{j}^{m})) \right] + \beta X_{ij} + e_{ijt}$$



Reversal of Rent Gradient New York

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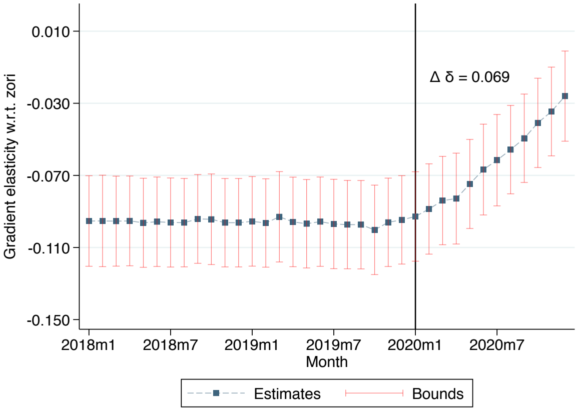
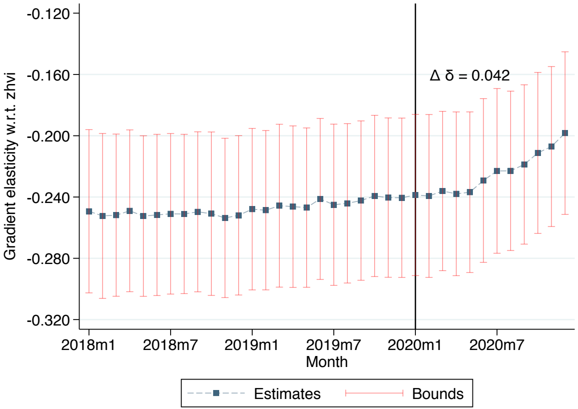


Partial Reversal of Price Gradient New York

$$\ln \text{Price}_{ijt} = \alpha_{jt} + \delta_{jt} \left[\ln(1 + D(\mathbf{z}^z_{ij}, \mathbf{z}^m_j)) \right] + \beta X_{ij} + e_{ijt}$$

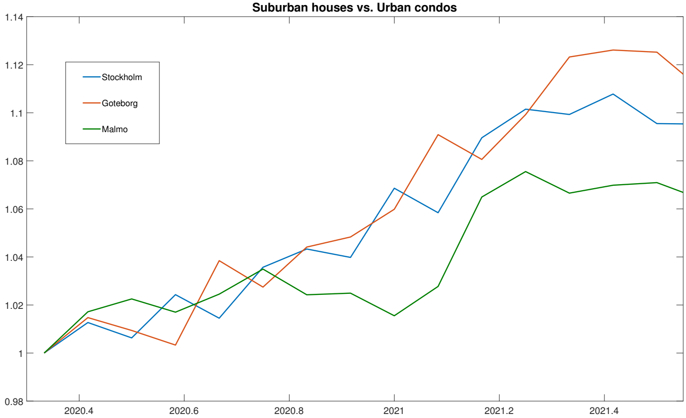


Patterns Hold Widely

- These patterns hold broadly for the largest 30/50 metropolitan areas in the U.S.
- They continue in the first half of 2021

Patterns Hold Widely

- These patterns hold broadly for the largest 30/50 metropolitan areas in the U.S.
- They continue in the first half of 2021
- Also present in Sweden



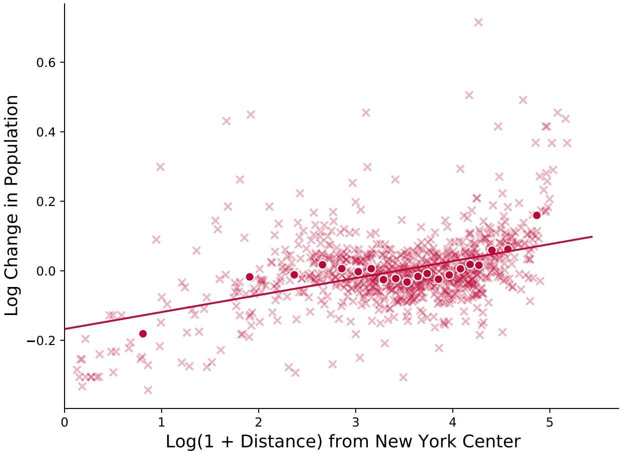
Questions

- Why did prices and rents fall more/grow less in urban core than in the suburbs? WFH vs. urban amenities

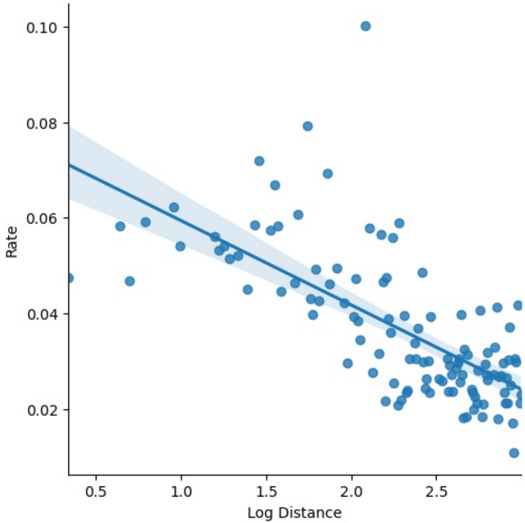
- What inference can we make from smaller effects on prices than on rents?

Urban Flight

- Covid-19 prompted a large urban flight to suburbs over Feb 2020–Jun 2020
- Venpath cell phone data

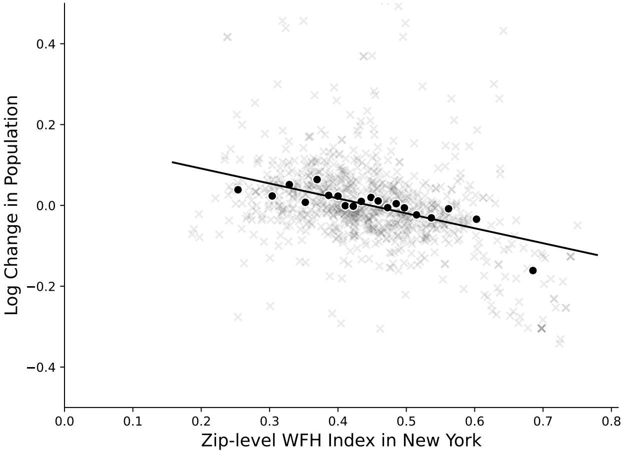


Out-Migration from New York



Remote Workers More Likely to Flee

- Flight is stronger from locations with higher rents and higher prices
- Flight is stronger from locations where jobs can be done remotely (high WFH score)



Explaining the Variation in Rent Gradient Changes MSA level

$$\underbrace{\Delta\delta_j}_{\text{Change in Rent Gradient}} = \alpha + \beta_1 \text{WFH} + \beta_2 \text{Stringency} + \beta_3 \text{Supply Inelasticity} + \varepsilon_j$$

Work from Home	0.302***			0.239**	0.302***
	(0.0919)			(0.0950)	(0.0891)
Stringency Measure		0.192**		0.122	
		(0.0697)		(0.0759)	
Supply Inelasticity Index			0.0215	0.00483	
			(0.0156)	(0.0148)	
Orthogonalized Stringency Index					0.132*
					(0.0690)
Orthogonalized Supply Inelasticity					0.00483
					(0.0148)
Observations	30	30	30	30	30
R^2	0.278	0.213	0.063	0.370	0.370

Remote Work Lowers Rents ZIP-Level

10 percentage point increase in remote work at ZIP-level → 1.8–2.9 percentage point decrease in rents

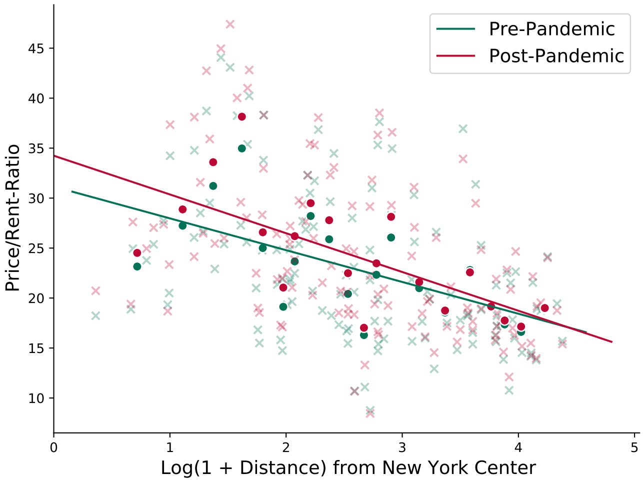
Log(Distance)	0.0292***		0.0247***	0.0252***	0.0240***	0.0233***
	(5.95)		(5.33)	(6.29)	(5.49)	(6.82)
Work from Home		**-0.274*****	**-0.287*****	**-0.225*****	**-0.182*****	**-0.227*****
		(-9.12)	(-9.22)	(-12.79)	(-6.17)	(-9.68)
Log(2017 Income)					-0.00237	-0.000886
					(-0.43)	(-0.18)
Median Age					0.000136	0.000212
					(0.25)	(0.70)
Percent of Black Households					0.00667	0.0223*
					(0.29)	(2.03)
Share of High Income Households					-0.0663**	0.0264
					(-2.14)	(1.34)
Log(Restaurants & Bars)					-0.0144***	-0.00865***
					(-5.36)	(-4.52)
MSA fixed effects	✓	✓		✓		✓
Observations	1697	1697	1697	1697	1697	1697
R^2	0.566	0.527	0.475	0.671	0.524	0.690

Taking Stock

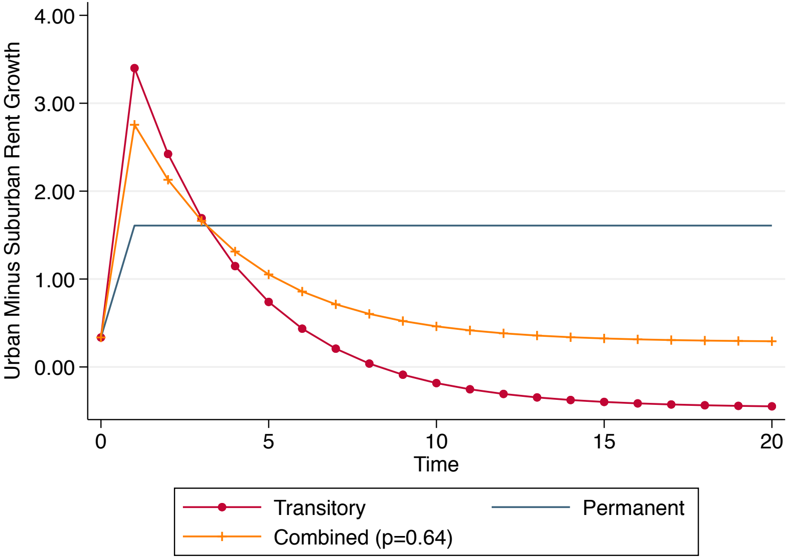
- WFH is the main driver of cross-sectional variation in rent growth across MSAs and ZIP codes
- Role of urban amenities appears to be less important
- Role of WFH for rent changes is larger than for price changes
- Since prices are forward-looking, this suggests housing market participants expect a partial reversal of WFH in future
- Use a simple asset pricing model (Campbell and Shiller, 1989) to back out what the relative change in prices and rents in urban versus suburban locations means for **urban-minus-suburban expected rent growth**, i.e., for strength of the urban revival

$$p_t - r_t = \frac{k}{1-\rho} + E_t\left[\sum_{j=1}^{+\infty} \rho^{j-1} \Delta r_{t+j}\right] - E_t\left[\sum_{j=1}^{+\infty} \rho^{j-1} ret_{t+j}\right]$$

Price-Rent Ratio against Distance for New York City



Urban-minus Suburban Rent Growth New York



Conclusions

- Model predicts an **urban revival**: higher rent growth in urban than in suburban areas
- The more transitory the WFH shock, the larger the initial urban revival and the weaker the long-run effect

2. Commercial Prices and Rents in Pandemic

Work in progress with Gupta and Mittal

The Pandemic: A Brief Tour of CRE Sectors

- Effects are very different on various sectors: covid-impaired, covid-resistant, covid-enhanced
  - Hospitality
    - Massive 2020 impact (RevPar -80%) and substantial distress
    - Travel not expected to return to 2019 levels until 2025
    - Some conversions of hotels into apartments
    - Business hotels/conference venues versus leisure hotels

The Pandemic: A Brief Tour of CRE Sectors

- Effects are very different on various sectors: covid-impaired, covid-resistant, covid-enhanced
  - Hospitality
  - Retail
    - E-commerce apocalypse for brick-and-mortar started well before covid, but covid accelerated adoption by five years
    - Grocery-anchored strip centers vs. Sears-anchored malls
    - Mall conversions into industrial space, senior housing complexes, etc.

The Pandemic: A Brief Tour of CRE Sectors

- Effects are very different on various sectors: covid-impaired, covid-resistant, covid-enhanced
  - Hospitality
  - Retail
  - Office
    - Ultra-low office usage for almost a year
    - Highest vacancy in 30 years + large sublease inventory
    - Lease renewals slow; shorter leases; larger concessions; lower rents
    - Office valuations in major markets? Non-major markets?
    - WFH: how long, how much?
    - Urban vs suburban (satellite offices)

The Pandemic: A Brief Tour of CRE Sectors

- Effects are very different on various sectors: covid-impaired, covid-resistant, covid-enhanced
  - Hospitality
  - Retail
  - Office
  - Apartments
    - Substantial exodus from urban areas during pandemic
    - Rising vacancy rates, larger concessions, lower rents in pandemic
    - Urban vs. suburban, gateway vs/ secondary metros

The Pandemic: A Brief Tour of CRE Sectors

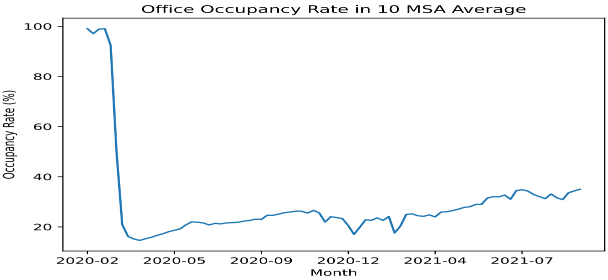
- Effects are very different on various sectors: covid-impaired, covid-resistant, covid-enhanced
  - Hospitality
  - Retail
  - Office
  - Apartments
  - Industrial
    - On fire, all-time low cap rates
    - Flip side of e-commerce

The Pandemic: A Brief Tour of CRE Sectors

- Effects are very different on various sectors: covid-impaired, covid-resistant, covid-enhanced
  - Hospitality
  - Retail
  - Office
  - Apartments
  - Industrial
  - Data centers, cell phone towers, life sciences

Working from Home and Physical Office Occupancy

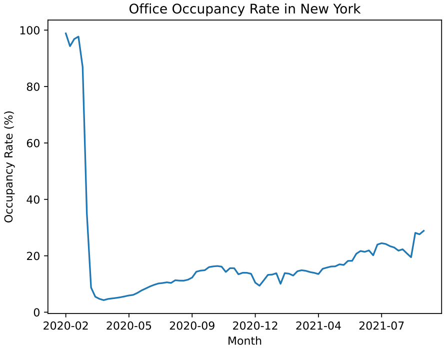
- About 70% of college-educated did some or all of their work from home during pandemic
- Physical office occupancy fell to 15% in March-May 2020
- Occupancy rate recovering, but still less than 40% as of end of September 2021

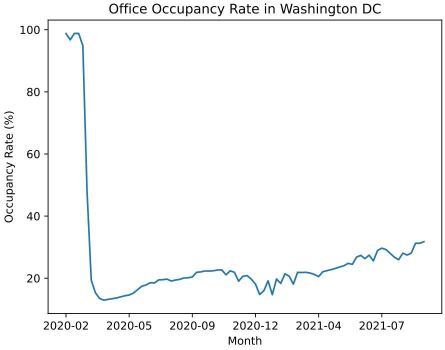


Source: Kastle turnstile data

Physical Office Occupancy

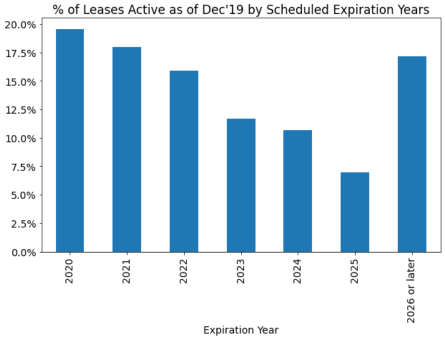
- Even worse in major markets, and unexpectedly slow recovery
  - NY metro: 22.9%
  - Washington DC metro: 26.8%





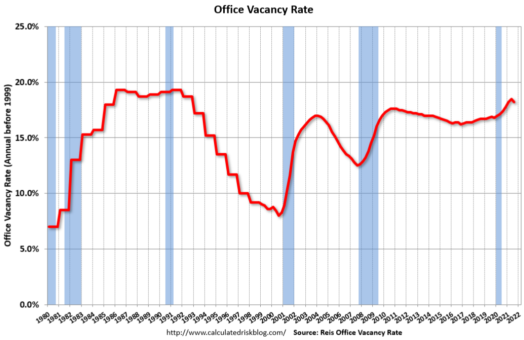
Lease Expiration Schedule

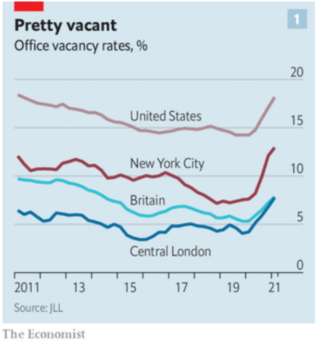
- Most office leases are long-term and not up for renewal
- Nearly all (credit) tenants continue to pay despite not using the space



Office Vacancy Rates

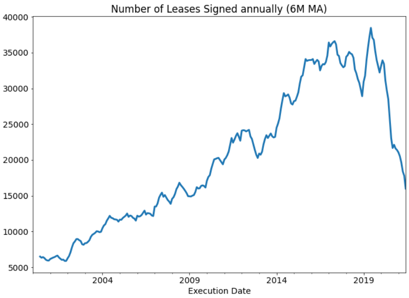
- Low physical occupancy only gradually affects contractual vacancy
  - Manhattan office vacancy rate of 18.3% in 2021.Q2, at 30-year high
  - Similar dynamics in London

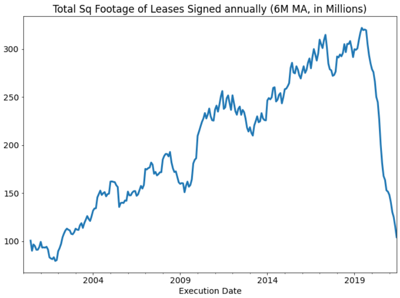




Office Leasing Market: Volumes

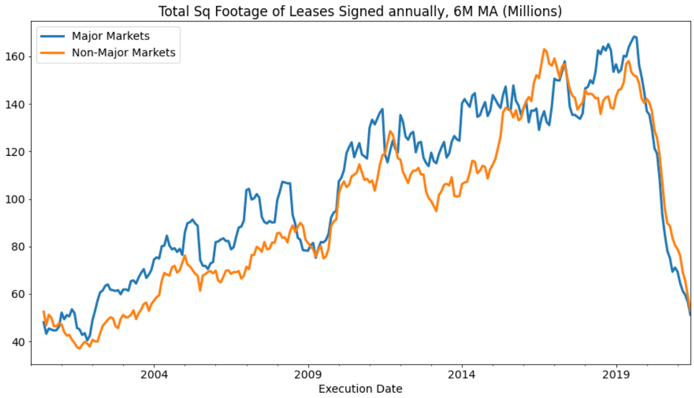
- New leasing activity extremely slow: 50% drop





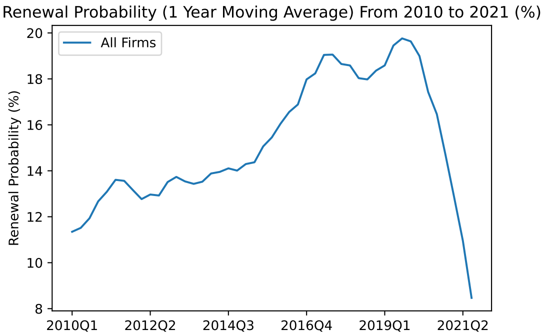
Office Leasing Market: Volumes in (non-)Major Cities

- Major Markets versus Non-Major Markets: similar drop in leasing



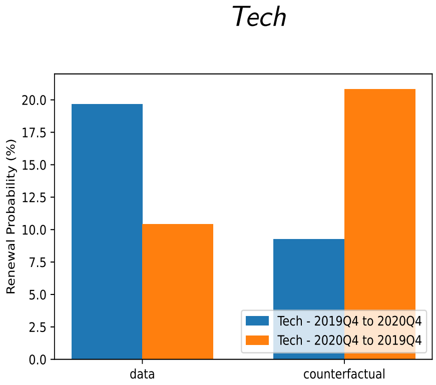
Lease Renewal Probabilities

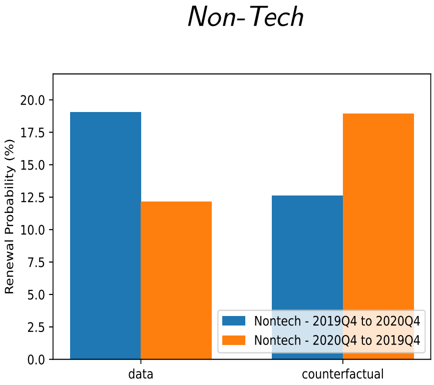
- For all leases expiring, check whether tenant signs new lease in same building
- Model lease renewal probability as function of building, lease, and tenant characteristics
- Find 50% drop in lease renewal probability



Lease Renewal Probabilities

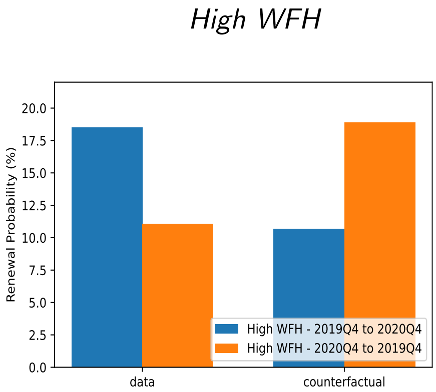
- Tech firms vs. all other tenant industries
- Tech firms saw the largest drop-off in renewals

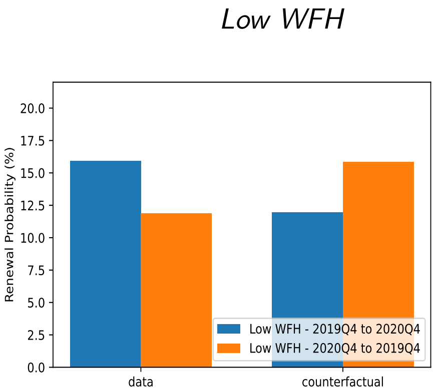




Lease Renewal Probabilities

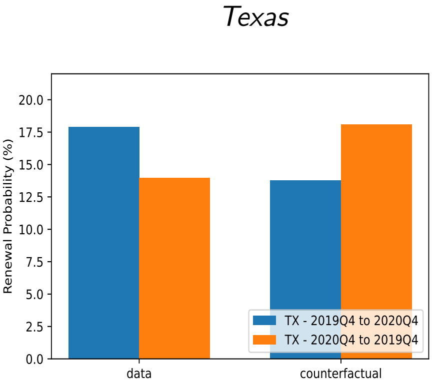
- High vs low work-from-home ability tenants
- High-WFH saw the largest drop-off in renewals

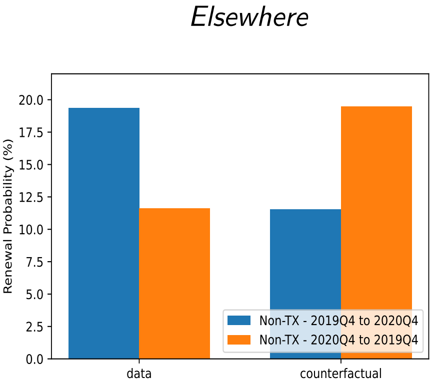




Lease Renewal Probabilities

- Highest renewal state: Texas
- Texas markets saw the smallest drop-off in renewals

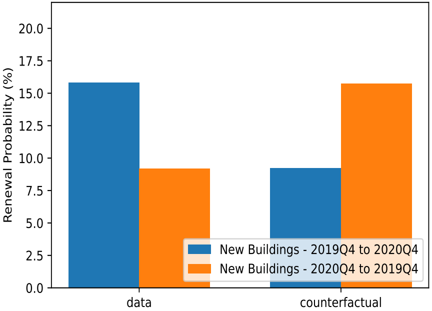




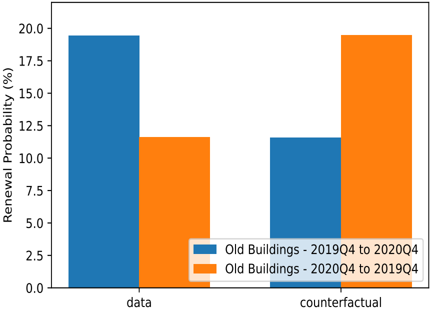
Lease Renewal Probabilities

- Newer vs. older buildings
- Older buildings saw a larger drop-off in renewals

Newer



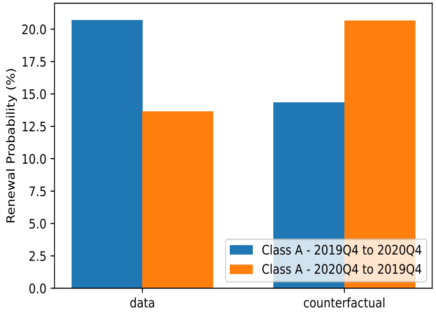
Older



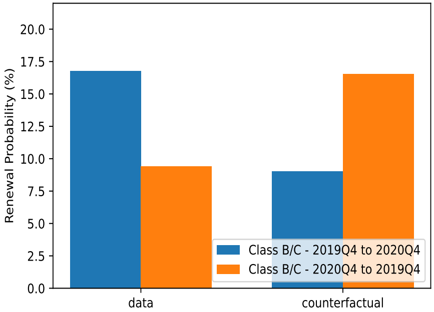
Lease Renewal Probabilities

- Building quality: A vs. B/C
- Higher renewals for A, but A similarly adversely affected

Class A

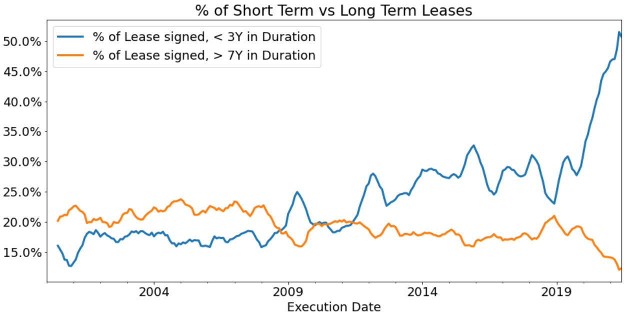


Class B/C



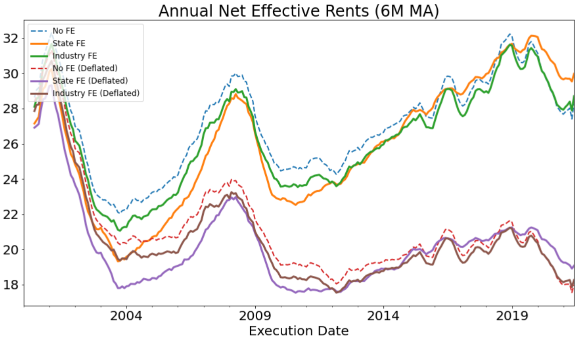
Share of Short-term leases

- Even if tenants renew, many are signing shorter-term leases
- Share of all new leases signed that are less than 3 years and more than 7 years in duration



Office Leasing Market: Rents

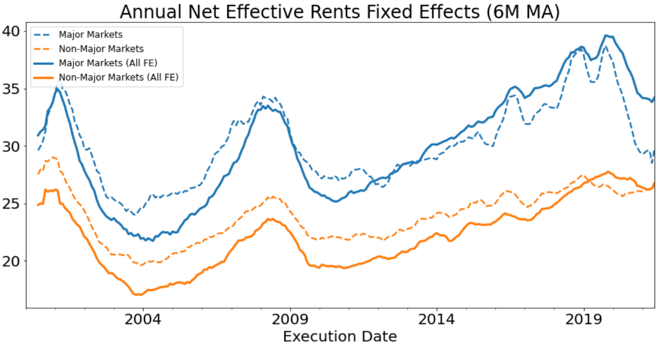
- Net effective rents include concessions (free rent) and tenant improvements
- NER have fallen 21.5% in nominal and 24.5% in real terms since December 2019



Source: Compstak, own calculations

Office Leasing Market: Rents in (non-)Major Cities

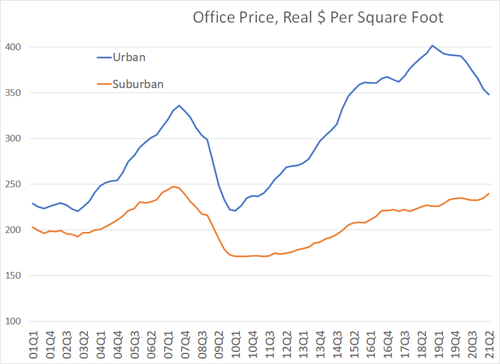
- Net effective rent decline attributable to major markets
- No rent decline in non-major markets



Source: Compstak, own calculations

Private Sector Office Valuations

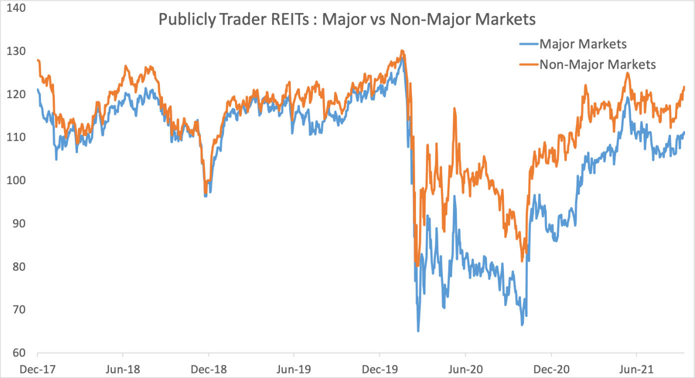
- U.S. office transaction prices (per sf, hedonically adjusted, real terms)
  - All: +3.0% since 2018.Q4 and -0.7% since 2019.Q4
  - CBD: -13.3% since 2018.Q4 and -10.9% since 2019.Q4
  - Suburban: +5.9% since 2018.Q4 and +2.1% since 2019.Q4



Source: Real Capital Analytics, own calculations

Public Sector Office Valuations

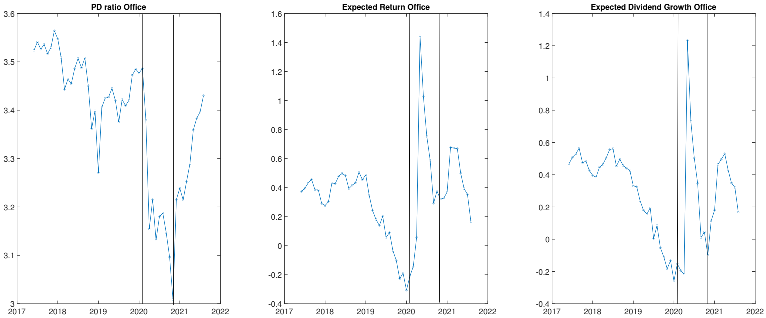
- U.S. office REIT returns, split by portfolio location
  - Major markets: -49% Feb 13-March 20, 2020 and +71% since March 20, 2020
  - Non-major markets: -38% Feb 13-March 20, 2020 and +52% since March 20, 2020



Source: CRSP, own calculations

Whiplash in Office REIT Valuations: Cash Flows or Discount Rates?

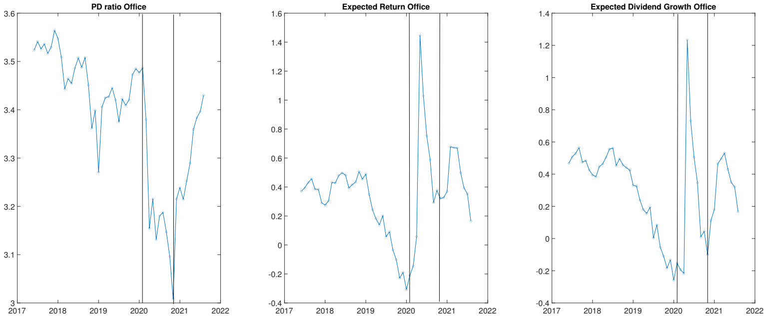
- U.S. office REIT price-dividend ratio
  - Dec 19-Sept 20: -47% in pd, +50% exp ret , +3% exp div gr
  - Sept 20-Jul 21: +42% in pd, -15% exp ret, +27% exp div gr



Source: NAREIT, CRSP, K. French, own calculations

Whiplash in Office REIT Valuations: Cash Flows or Discount Rates?

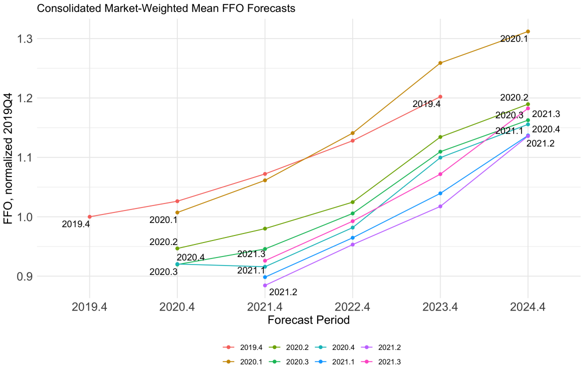
- U.S. office REIT price-dividend ratio
- REIT market has bullish cash flow growth expectations as of July 21, but not quite as bullish as in Spring 21



Source: NAREIT, CRSP, K. French, own calculations

REIT Analyst CF expectations

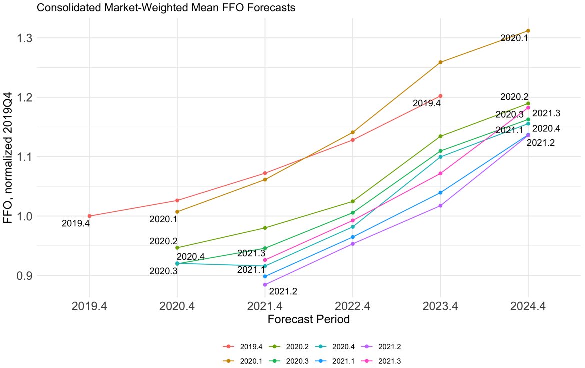
- Downward revisions of CF levels as pandemic hit, continuing until 2021.Q2
- High expected CF growth from lower base levels



Source: IBES, own calculations

REIT Analyst CF expectations

- REIT analysts do not seem overly worried about long-run decline in office rents



Source: IBES, own calculations

3. Broader Ramifications for Future of Cities

Working from home

- Barrero, Bloom, and Davis (2020): number of remote working days will increase 4x to 22%.
- Employer surveys: many CEOs think remote work is here to stay
  - Gartner survey of CFOs: 80% of employers plan to allow employees to work remotely at least part of the time after the pandemic; 47% will allow employees to work from home full-time
  - PwC survey of 669 CEOs: 78% agree remote collaboration is here to stay for the long-term
  - Partnership for NYC: 70% expect hybrid work, 26% expect a full return.

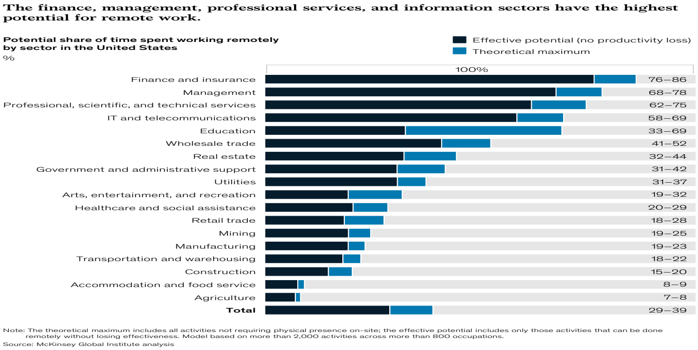
Working from home

- Barrero, Bloom, and Davis (2020): number of remote working days will increase 4x to 22%.
- Employer surveys: many CEOs think remote work is here to stay
- Employees also want to work remotely, on average 1 day per week more than the employer's want them to.
  - FlexJobs survey: 96% of employees desire some form of remote work; 65% report wanting to be full-time remote employees post-pandemic, and 31% want a hybrid remote work environment
  - In a tight labor market, employees are holding the cards

Working from home

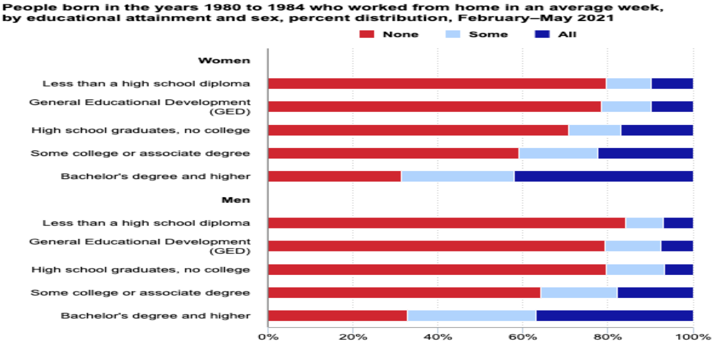
- Barrero, Bloom, and Davis (2020): number of remote working days will increase 4x to 22%.
- Employer surveys: many CEOs think remote work is here to stay
- Employees also want to work remotely, on average 1 day per week more than the employer's want them to.
- Many firms have instituted permanent remote work opportunities (PWC, Allstate, Square, Slack, Dropbox etc.), many others have a permanent hybrid option (Microsoft, Twitter, Facebook)

Remote Work Potential



- McKinsey estimates that 22% of work in the U.S. can be done remotely for 3-5 days per week *without loss of productivity*
- An additional 17% of workforce can work remotely 1-2 days

Remote Work Unequally Distributed



- 69% of women and 67% of men with a bachelor's degree or higher did some or all of their work at home during pandemic
- Among high school graduates, 71% of women and 80% of men did none of their work at home
- Remote work might amplify inequality in quality of life

Tax Base Ramifications

- Local amenities (police, public transportation) often funded to a large extent by local tax revenue
- Property taxes often important part of local tax revenue
- NYC property tax revenue loss for fiscal 2022 due to office: -$850 million
  - Tax-assessed valuation of office buildings: -16.6% (-$28.6 billion)
  - Office sector property taxes bring in $6.9 billion
  - Overall Property tax collections expected to fall by $1.7 billion or -5.4%
- Additional multiplier effects from lost tax revenues on retail properties (30% vacancy in midtown Manhattan) + sales tax + income tax
- Risk: 1970s-style downward spiral in tax revenue and urban amenity quality

Two Wild Cards for Large Cities

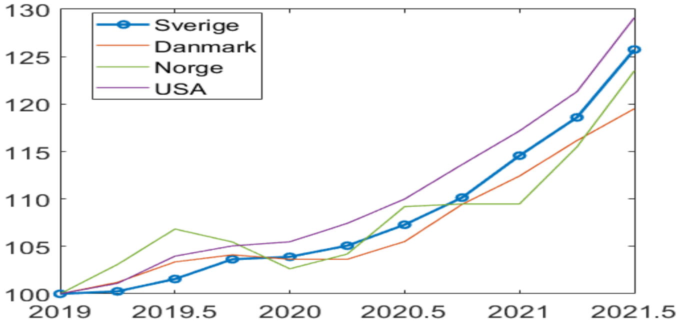
- Secular growth in office-using employment (e.g., tech sector) provides tail wind for office, esp. after pandemic recedes
- Large urban centers were **too small** before pandemic (Hsieh and Moretti, 2019)
  - High cost of living deterred companies to locate in large metropolises
  - Left urban agglomeration benefits under-exploited
  - With WFH, companies may now choose to locate in large urban centers
  - Because their employees can live in suburbs, and commute into HQ a couple of days per week
  - Recent example: Rite Aid moves HQ to Philadelphia with creative/meeting spaces, as it becomes a “remote-first” firm

Conclusion

- WFH has and will continue to reshape where we live and work - the genie is out of the bottle
- Short- and medium-run headwind from low office occupancy, high vacancy, low lease renewals, falling rents, falling prices, falling tax revenues and safety concerns
- Long-run tailwind from growth in office-sector employment and from increased business relocation to major urban centers
- Which force dominates will depend not only on long-run productivity effects of WFH, but also on local policy choices
  - Tax policies in urban centers incentivizing residents and businesses to stay/return
  - Infrastructure improvements esp. in public transportation; later: driverless cars
  - Environmental: carbon tax for vehicles and buildings. High-density urban living has lowest carbon footprint.

Bonus Slide: Property Prices Are Rising Quickly

- House price growth very strong world-wide

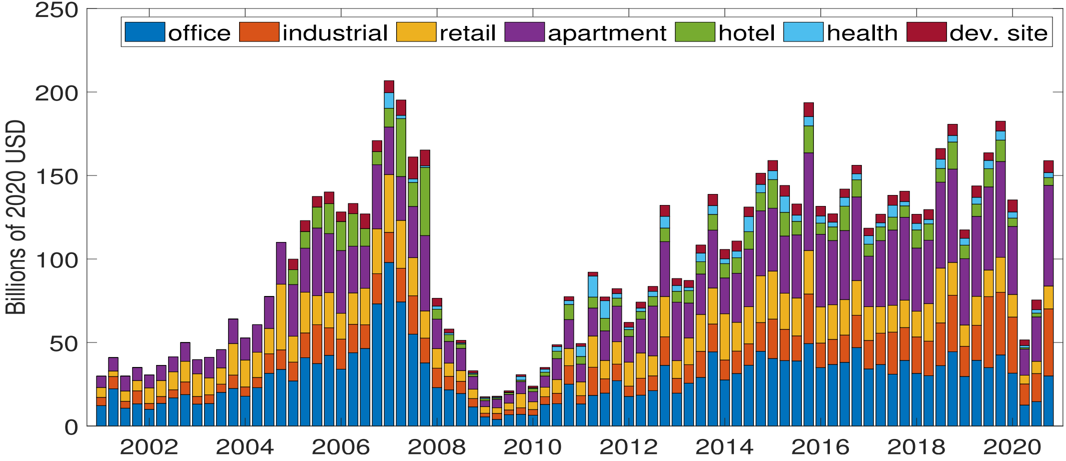


Bonus Slide: Property Prices Are Rising Quickly

- House price growth very strong world-wide
- Combination of several factors
  - Ultra-low (mortgage) interest rates
  - Shortage of supply, often due to restrictive zoning policies (NIMBY)
  - Covid-induced desire for more space (e.g., home office)
  - Generous government support enabled many to make downpayment on a house

CRE Prone to Boom-Bust Cycles

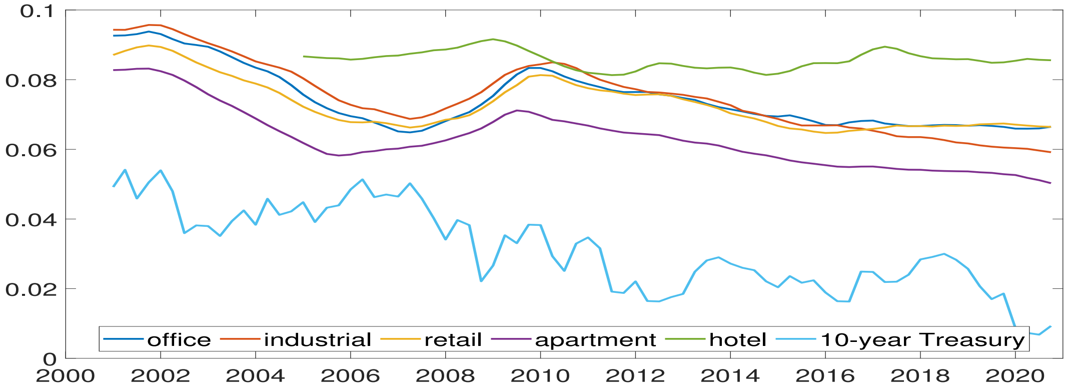
Figure: Quarterly Transaction Volume U.S. CRE



Source: Real Capital Analytics and Bureau of Labor Statistics

Cap Rate Compression in Private Markets

Figure: Cap Rates U.S. CRE



Source: RCA, Fred

- Cap rate = expected return - expected growth rate