

CBRE EA's 'Top of Mind'

April 27, 2023

Agenda

Section 1

Enhancements

Dennis Schoenmaker, Ph.D.



Section 2

Office-to-Multifamily Conversions

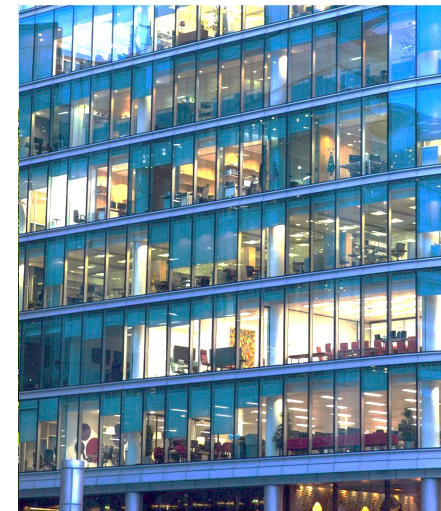
**Nathan Adkins
Christina Tong
Guest: Matt Vance**



Section 3

The Office Debt Funding Gap

**Dennis Schoenmaker, Ph.D.
Michael Leahy
Guest: Michael Riccio**



Section 4

CBRE EA Office Taking Rent Series

**Stefan Weiss
Franz Limoges
Guest: Dags Chen**



Platform Enhancements



Dennis Schoenmaker, Ph.D.

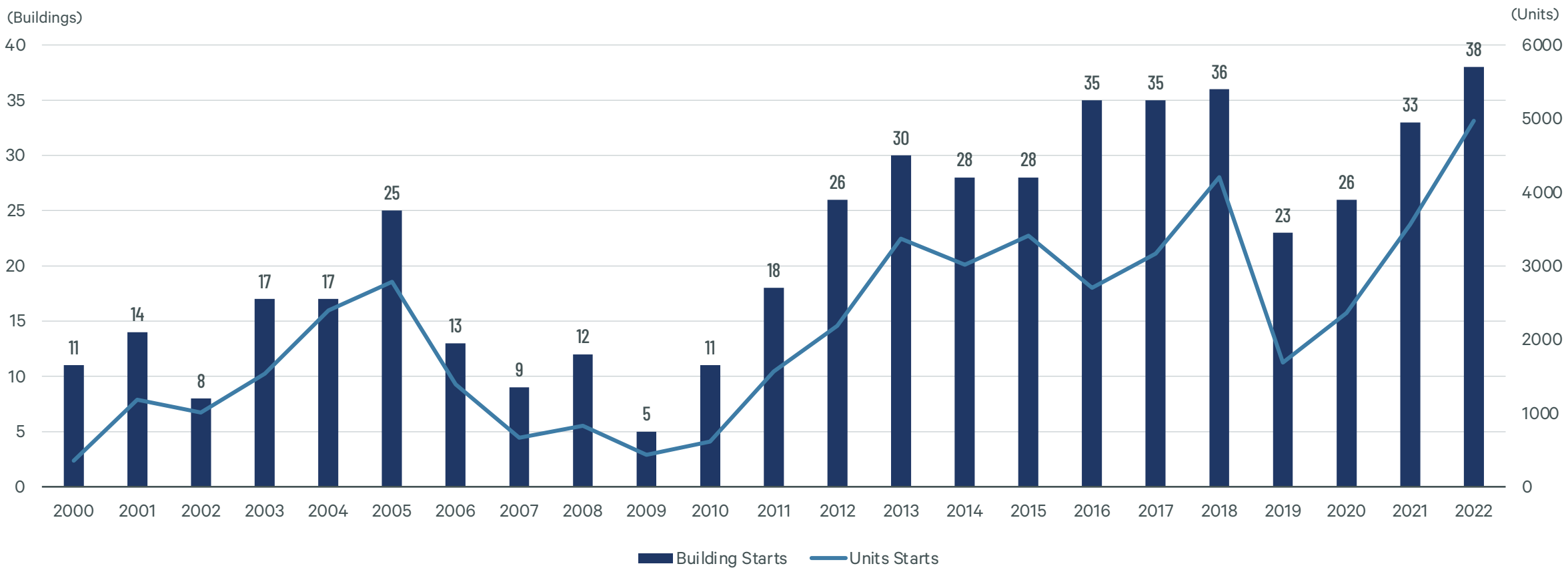
Executive Director &
Principal Economist

dennis.schoenmaker@cbre.com



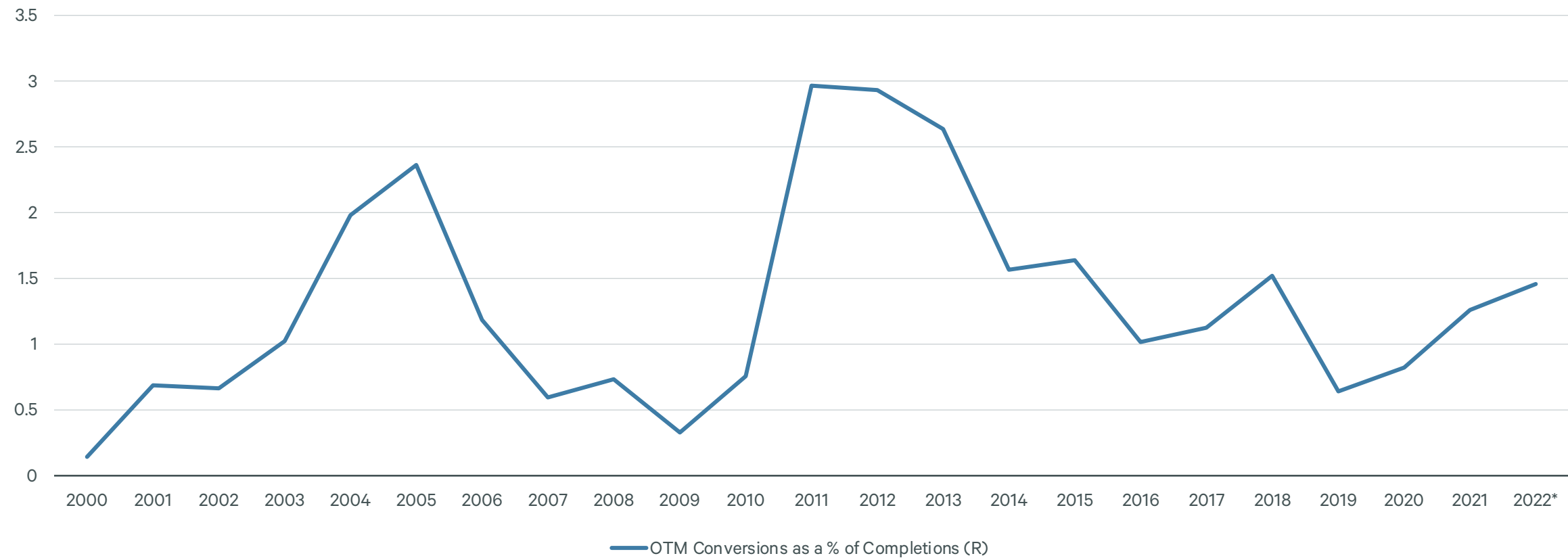
Office-to- Multifamily Conversions

Office-to-Multifamily Conversions Increased Slightly but Remain on Par with Historical Level



CBRE Econometric Advisors, Dodge Analytics, Q1 2023

OTM Conversions Account for a Very Small Percentage of Multifamily Completions



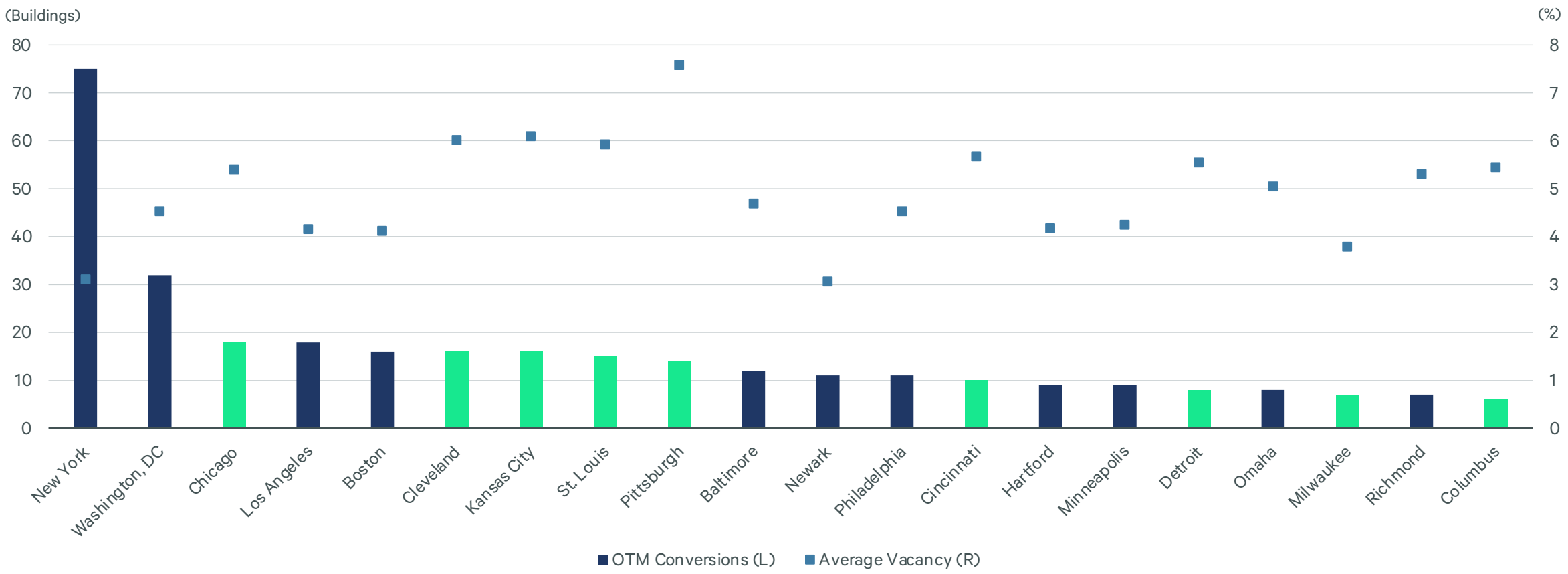
CBRE Econometric Advisors, Dodge Analytics, Q1 2023

Characteristics of Converted Office Buildings

	Median Year Built	Avg Floor Plate (SF)	Avg Building Vacancy Before Conversion
Conversions	1941	13,128	57%
All Office	1989	19,750	14.3%

- Conversions are expensive
- Most office buildings are not suitable for conversion

OTM by Market Counts Indicate There is More to This Equation



CBRE Econometric Advisors, Dodge Analytics, Q1 2023

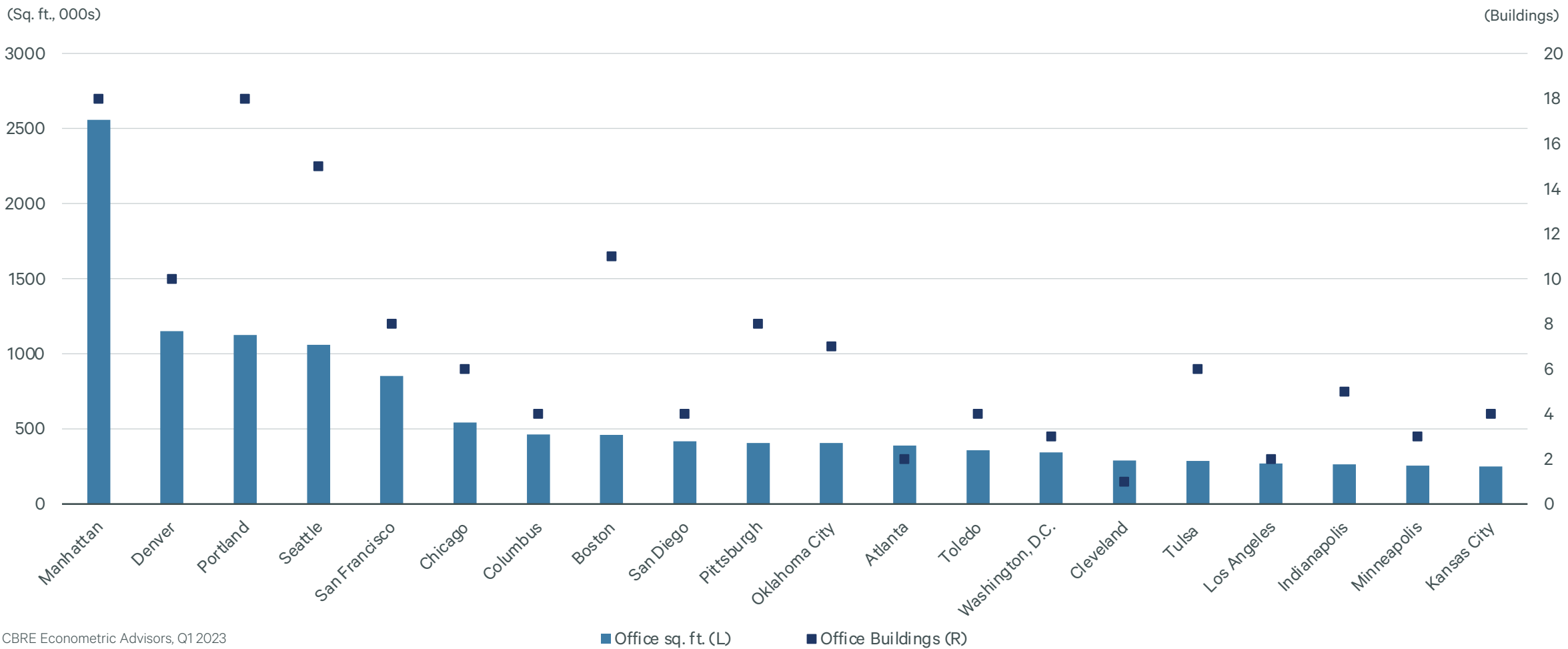
The Grand in Kansas City- Former Traders National Bank



- Former Traders National Bank
- Purchased over 60% vacant in 2016 and completed redevelopment in 2018
- \$69 million cost with \$40 million financing from banks
- \$22 million in state and federal historic tax credits
- Transformed into 202 apartments and 11,000 sq. ft. retail and commercial space



Markets with Most OTM Candidates

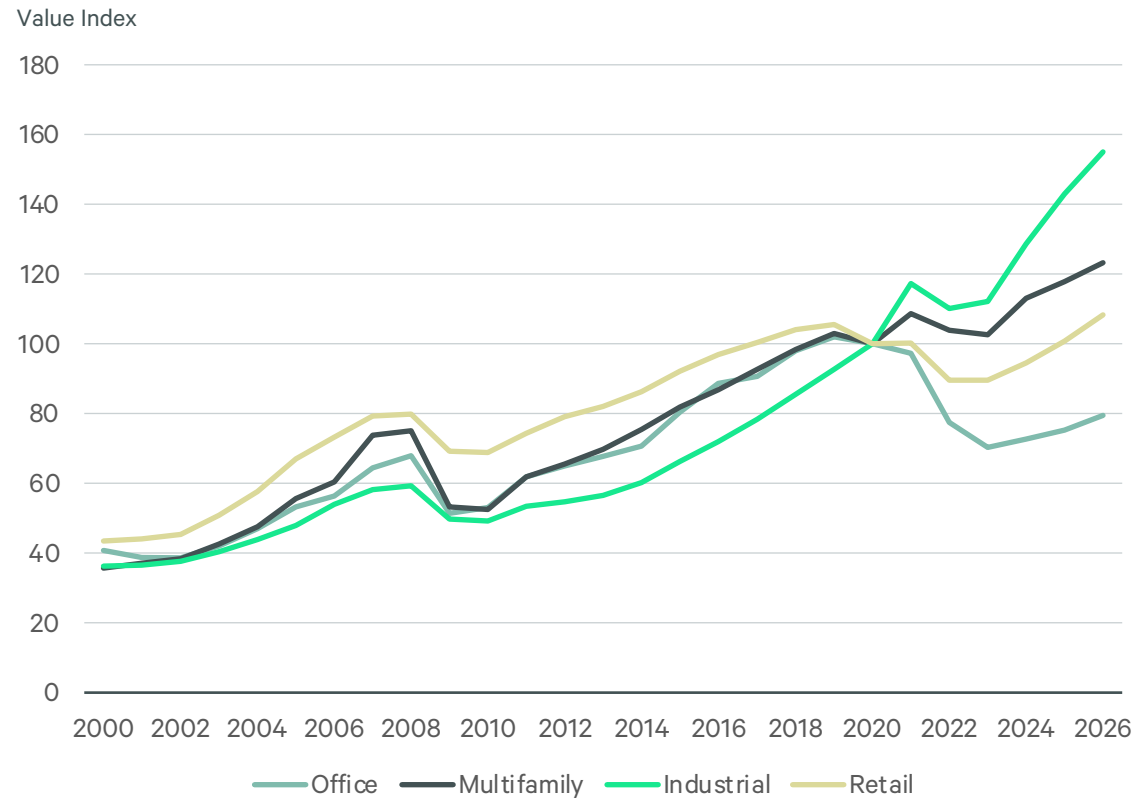




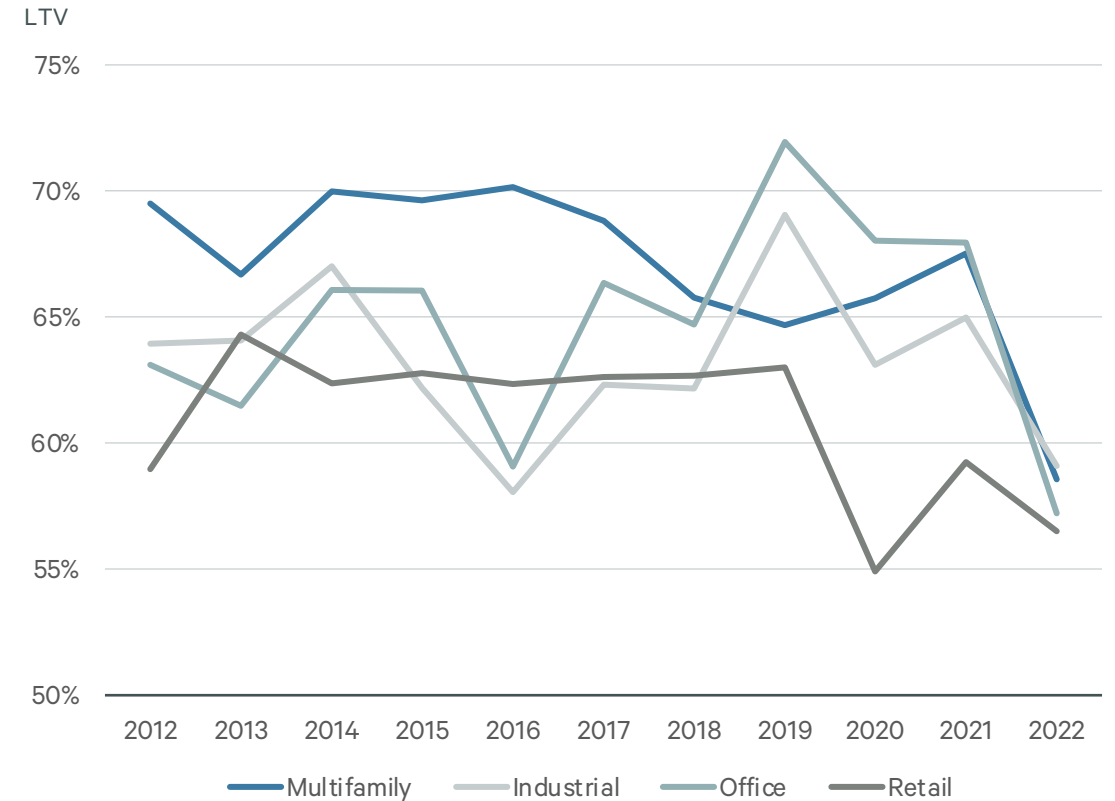
The Office Sector
Debt-Funding Gap:
Waves of Defaults
and Opportunities
Set to Come

Falling Values and Tighter Lending Impacts Investors

Annual Baseline Value Index

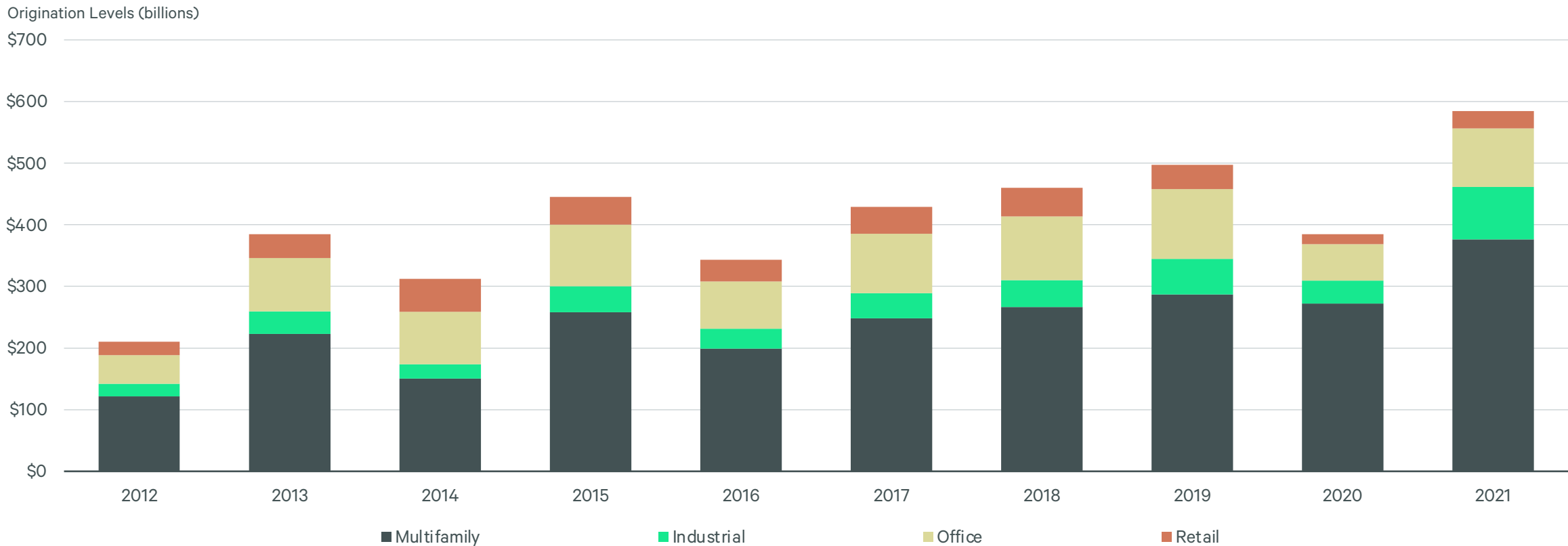


Annual Average LTV



Strong Recent Origination Activity

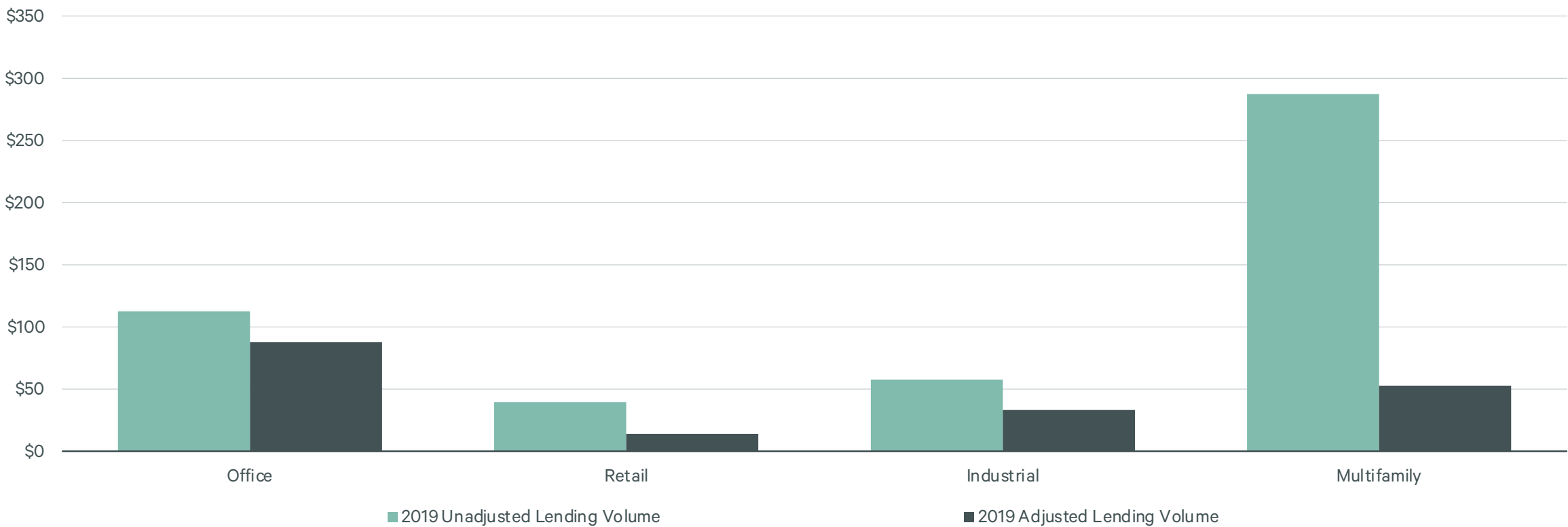
Annual Origination Levels by Sector



Mortgage Bankers Association

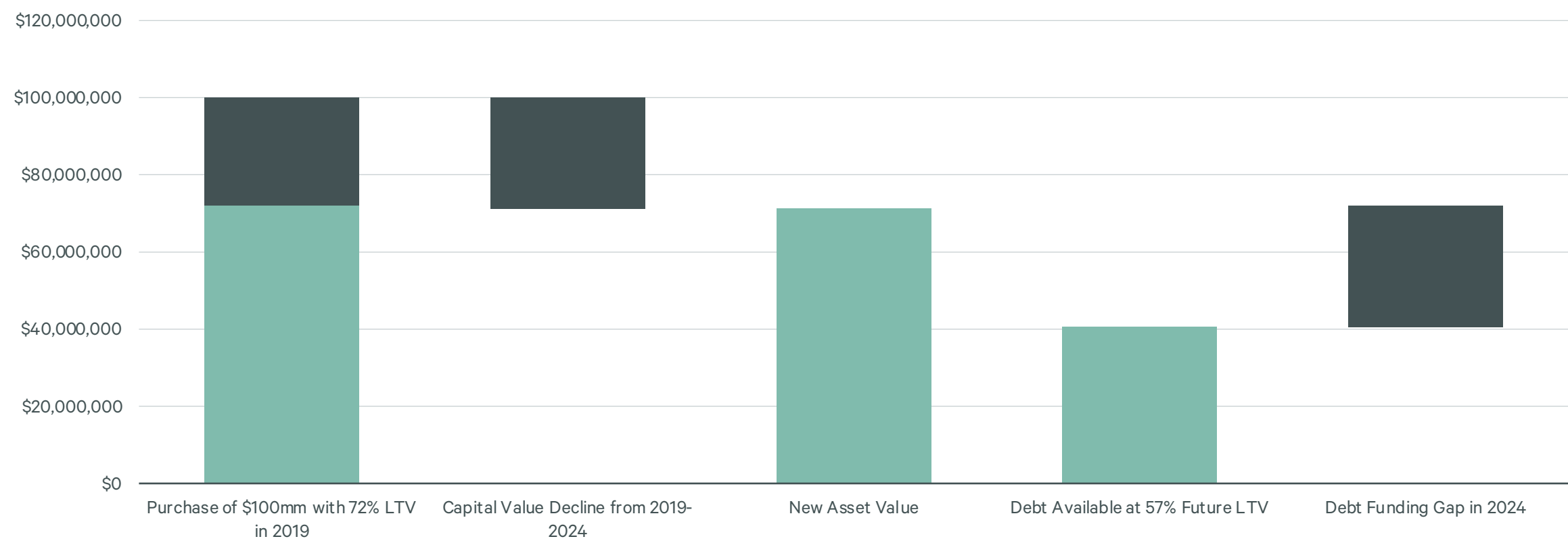
Large Fraction of Office Sector Due in Shorter-term

2019 Unadjusted vs. Adjusted Lending Volume (billions)



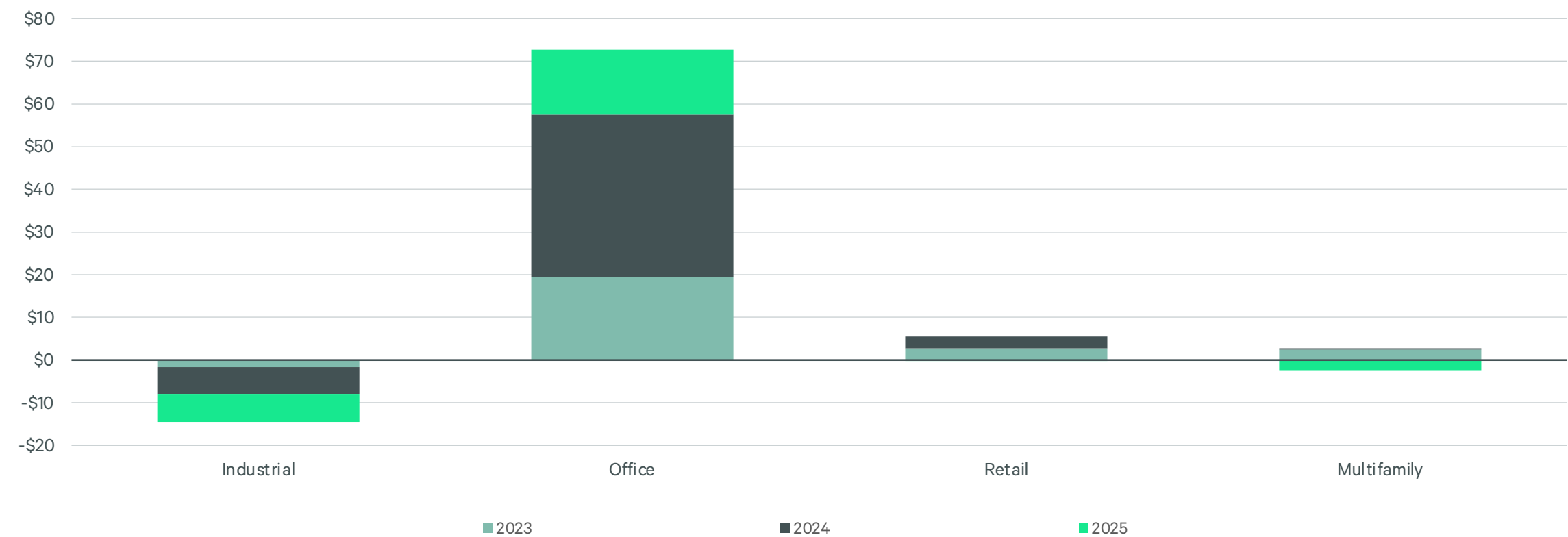
What is the Debt Funding Gap?

Debt-funding Gap Methodology for Sample Building



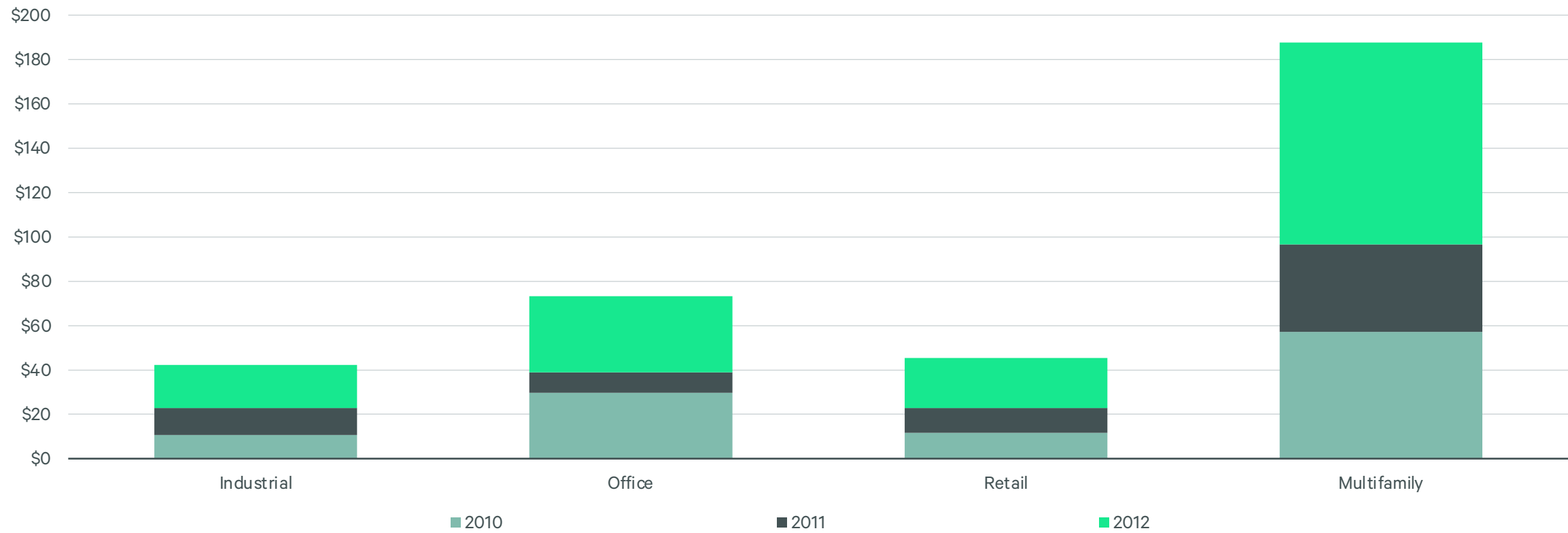
Office Sector Faces Large Cumulative Funding Gap

Debt-Funding Gap by Maturity Year by Sector (\$ Billions) 5-year Loans Originated in 2018, 2019, 2020



Office Situation on Par with GFC

2019 Debt-Funding Gap by Maturity Year by Sector (\$ Billions): 5-year Loans Originated in 2005, 2006, 2007



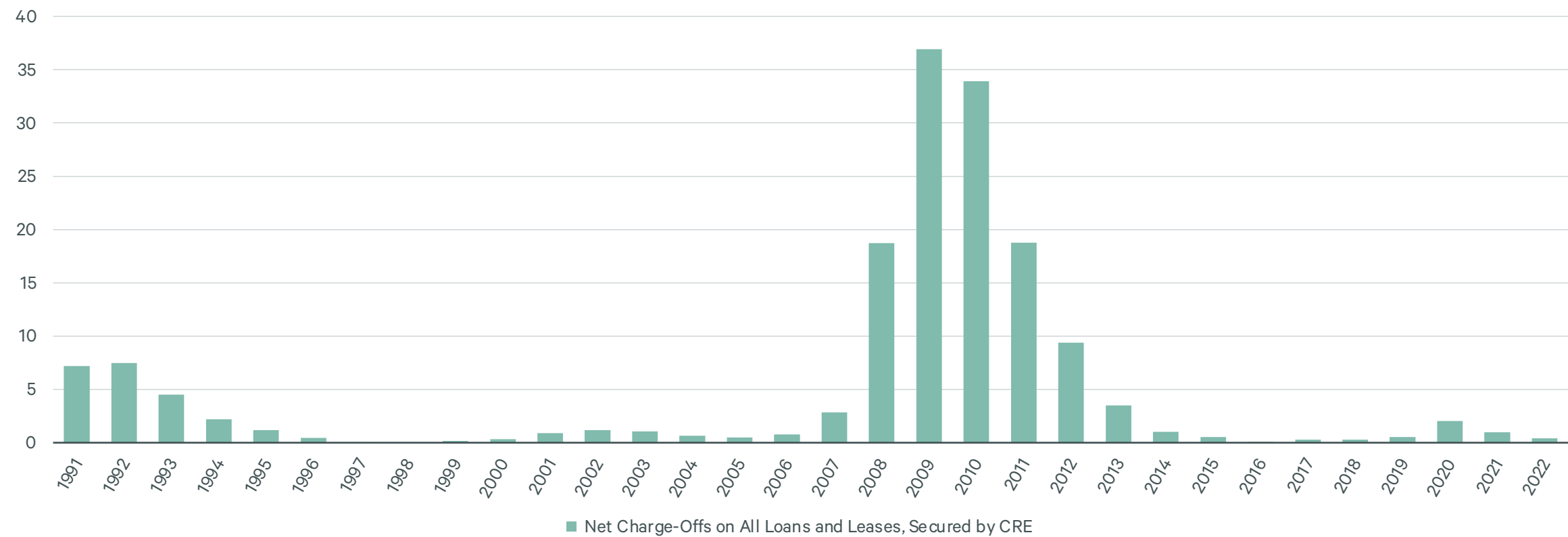
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The chart displays the Office Distress Index Score for 17 markets, indexed to the national average post-GFC. The Y-axis represents the percentage score, ranging from 0% to 160% in 20% increments. The X-axis lists the markets: Manhattan, San Francisco, Boston, Los Angeles, San Jose, Seattle, Denver, Phoenix, Miami, Charlotte, Dallas, Chicago, Houston, Austin, Atlanta, Washington, DC, Philadelphia, Nashville, and Sum of Markets. For each market, two bars are shown: a teal bar for the 'Current Office Distress Index Score - Indexed to National Average Post GFC' and a dark grey bar for the 'Post GFC Office Distress Index Score - Indexed to National Average Post GFC'.

Market	Current Office Distress Index Score - Indexed to National Average Post GFC (%)	Post GFC Office Distress Index Score - Indexed to National Average Post GFC (%)
Manhattan	114%	147%
San Francisco	131%	144%
Boston	36%	138%
Los Angeles	61%	134%
San Jose	51%	133%
Seattle	58%	132%
Denver	65%	127%
Phoenix	44%	124%
Miami	14%	121%
Charlotte	30%	103%
Dallas	51%	98%
Chicago	62%	96%
Houston	55%	88%
Austin	45%	76%
Atlanta	46%	73%
Washington, DC	33%	61%
Philadelphia	120%	59%
Nashville	75%	37%
Sum of Markets	78%	100%

Bridging the Debt Funding Gap

Net Write-Downs on CRE Loans, All Commercial Banks (\$ billions)



Federal Reserve

U.S. Financing Markets Overview



Michael Riccio

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CBRE EA
Office Taking
Rent Series

EA Taking Rent Methodology: Key Steps

1. **Assemble, tag, join and clean the data**
2. Calculate Taking Rent Discount ratio for each deal $[1 - (\text{taking}/\text{asking})]$
3. Model Taking Rent Discount ratio using deal-level and market-level data
4. Predict Taking Rent Discount using modeled coefficients in step 3
5. Aggregate (equal weighted) discounts by year
6. Apply Discount to EA Asking Rent Series (or any other asking rent series of choice)

Additional Steps Since Fall Forum

1. Pulling series back to the late '80s
2. Pulling series down to the submarket level
3. Creating Taking Rent series for Prime analysis
4. Expanding Taking Rent series to retail & industrial property types
5. EA Effective Rent Series (including TI, free rent, escalations, discount rate)

Benefits through Data Science: Relationships

- An important function in Data Science is using the maps and geocoding to tie disparate data sets together.
- Property Suites matched to Sales and Leasing transactions.
- Properties from one vendor's data set to another.
- Backfilling details from one set to another to paint a more complete picture of properties or transactions.

PropertyID	SuiteID	Name	Description	Location	...
10000000000000000000	10000000000000000000	10000000000000000000	10000000000000000000	10000000000000000000	...
10000000000000000000	10000000000000000000	10000000000000000000	10000000000000000000	10000000000000000000	...

SuiteID	Name	Location	...
10000000000000000000	10000000000000000000	10000000000000000000	...
10000000000000000000	10000000000000000000	10000000000000000000	...

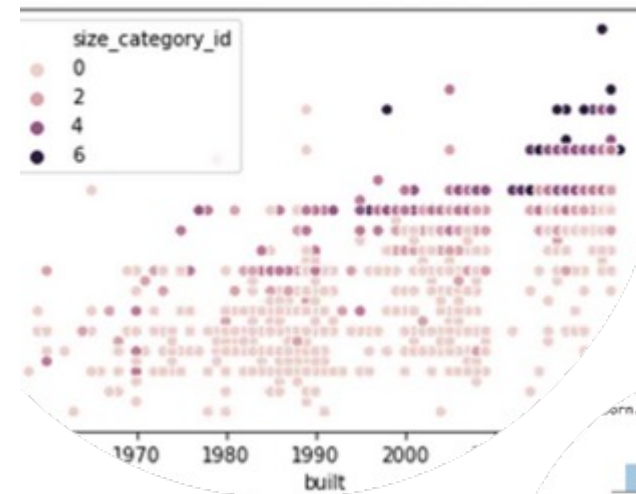
SuiteID	Name	Location	...
10000000000000000000	10000000000000000000	10000000000000000000	...
10000000000000000000	10000000000000000000	10000000000000000000	...

SuiteID	Name	Location	...
10000000000000000000	10000000000000000000	10000000000000000000	...
10000000000000000000	10000000000000000000	10000000000000000000	...

Exploring Relationships:

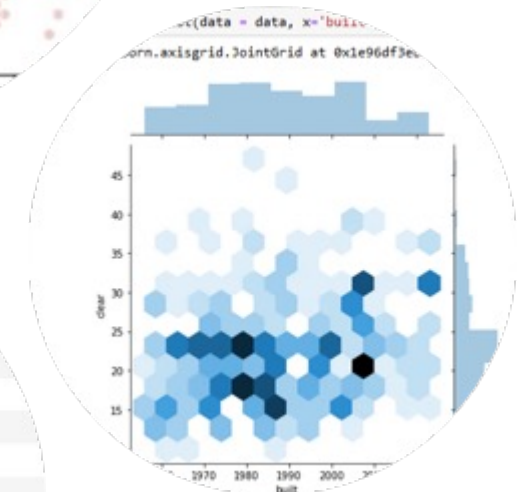
- Look for relationships in Python, SQL Server, Stata and ArcGIS Desktop
- We match and merge data from CBRE's internal and external sources to build one coherent data set suitable for building a taking rent series.
- Work with data providers to understand the value of what they are collecting and search for insights.
- Mapping data can unearth relationships which are not clear through data alone.

matplotlib.axes._subplots.AxesSubplot at 0x1e9



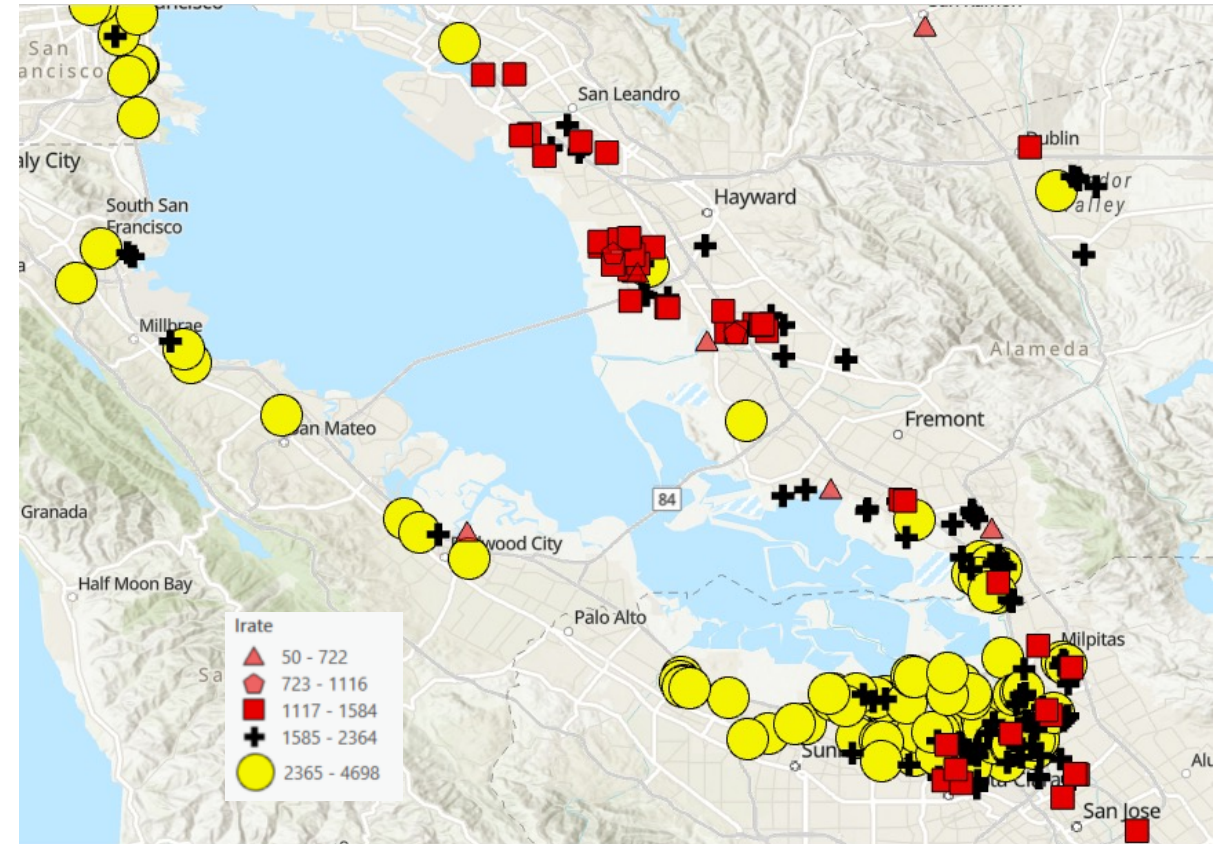
avail', 'vac', 'floors',

base	avail	vac	floors	built	clear
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0.000000	0.381162	0.333054	NaN	0.152190	0.459206
0.381162	1.000000	0.838041	NaN	0.200437	0.263695
0.333054	0.838041	1.000000	NaN	0.161378	0.196430
NaN	NaN	NaN	NaN	NaN	NaN
0.152190	0.200437	0.161378	NaN	1.000000	0.380934
0.459206	0.263695	0.196430	NaN	0.380934	1.000000
0.373794	-0.224104	-0.181134	NaN	-0.436220	-0.326460
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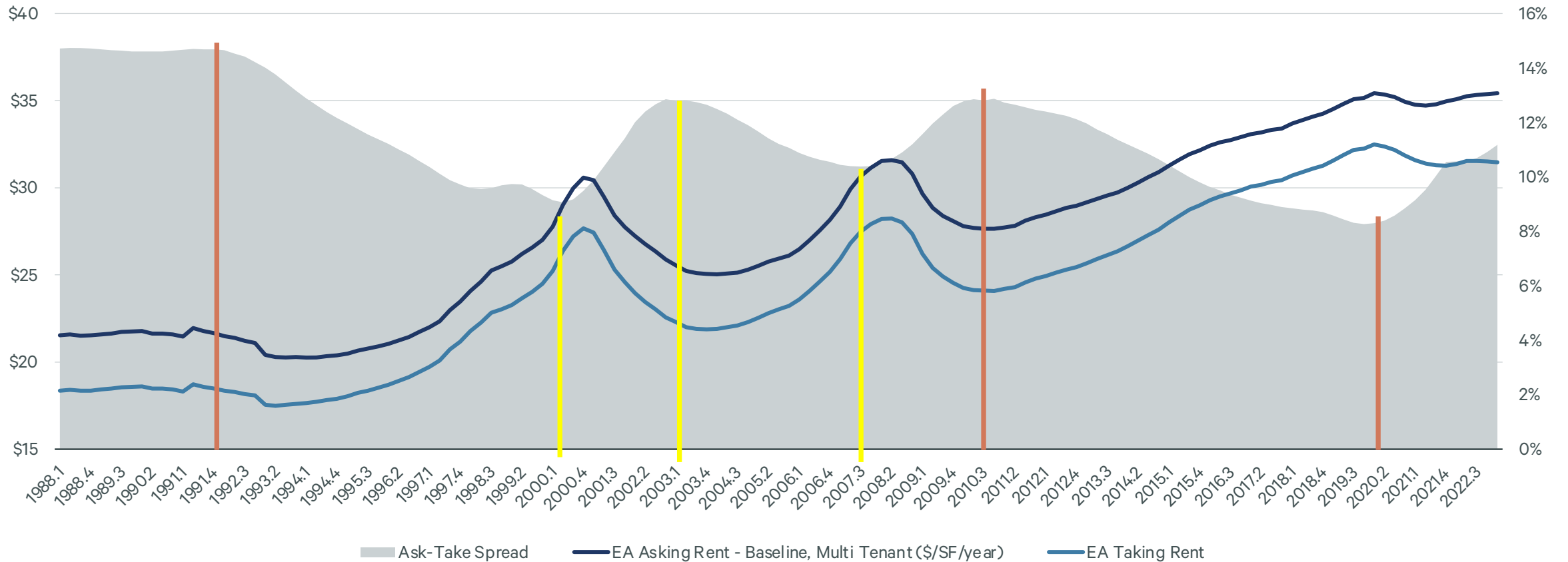


Benefits through Data Science: Outlier Detection & Correction

- Rents are frequently reported in annual or monthly levels but often they inadvertently arrive mixed together and improperly labelled.
- Displaying rents on a map can demonstrate very quickly when values seem out of place for the region to which they belong.
- Outlier detection can lead to correction and recovery of valuable data insights.



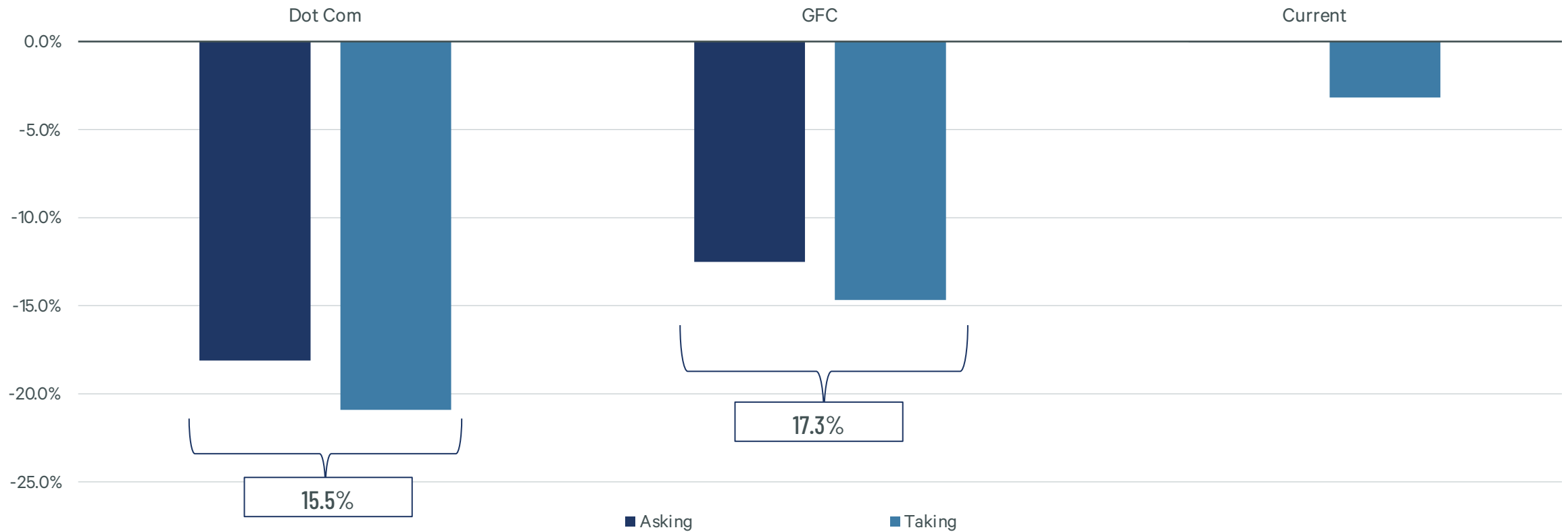
Taking Rent Discount Inflects Before Asking Rents



CBRE Econometric Advisors, Q1 2023

Asking Rents have Masked 16% of Rent Declines During Downturns

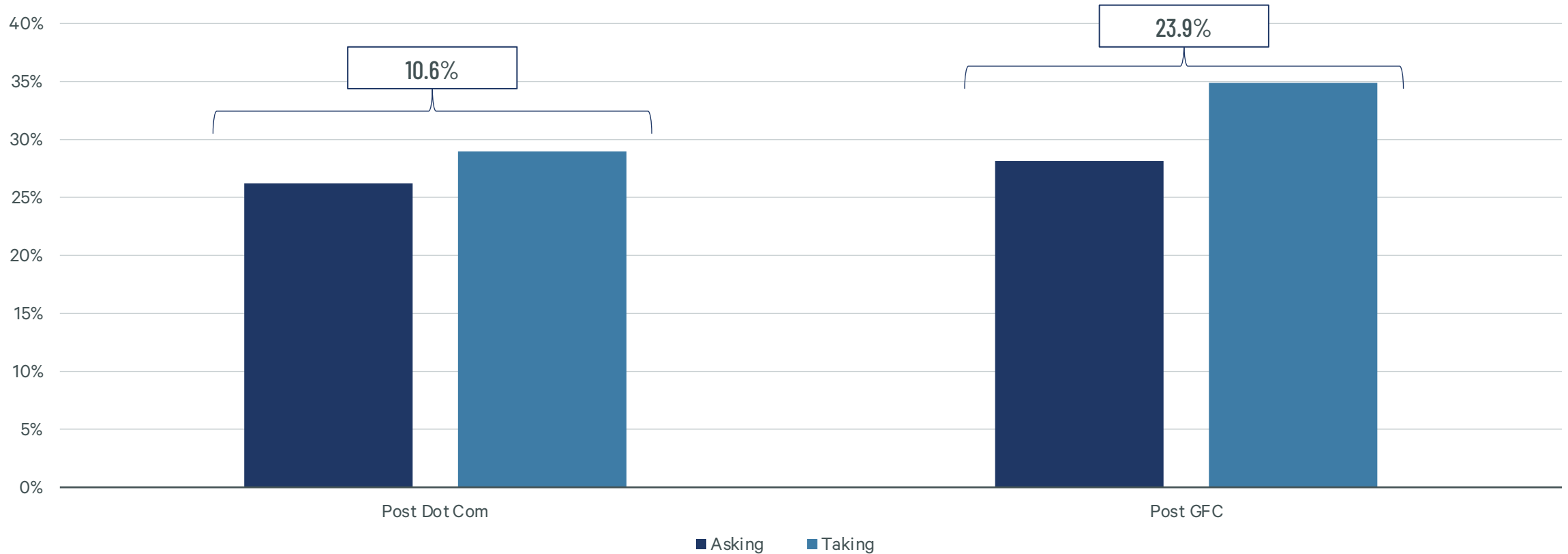
Rent Decline During Downturn



Source: CBRE Econometric Advisors, Q1 2023

And Subsequently Missed 10-24% of Post-downturn Rent Growth

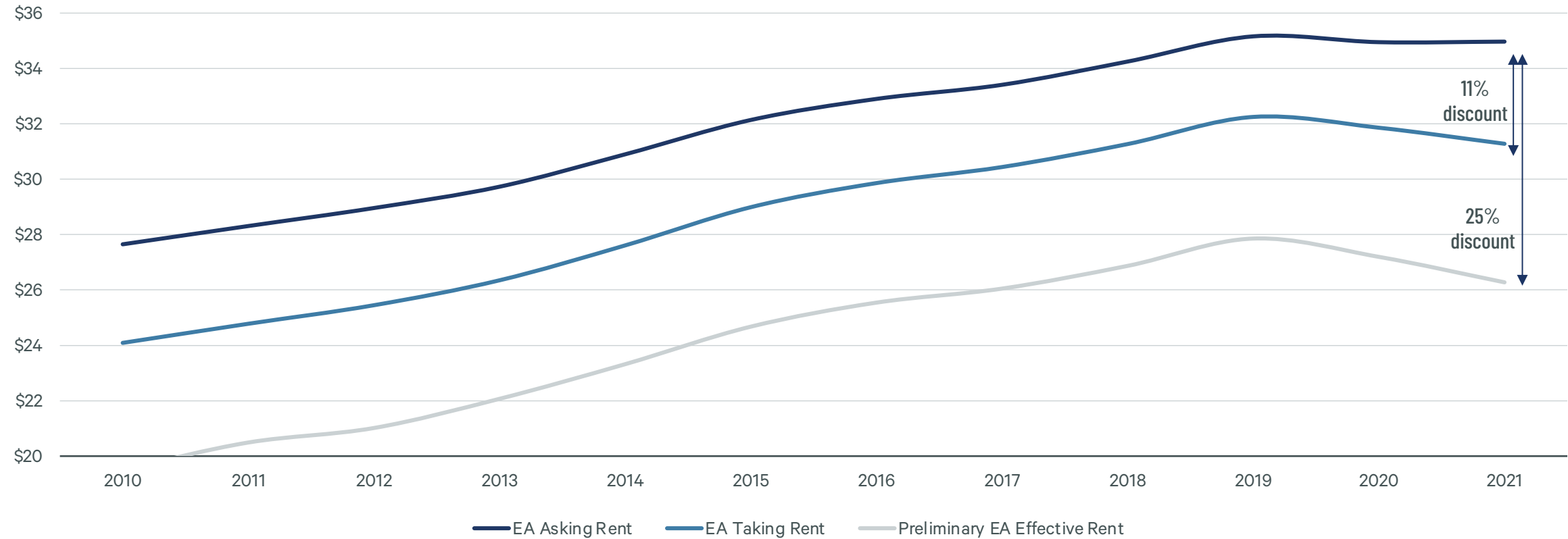
Rent Growth Following Downturn



Source: CBRE Econometric Advisors, Q1 2023

EA Effective Rents

U.S. Office Sum of Markets



Source: CBRE Econometric Advisors, Q1 2023

Client Commentary: Exploring Taking Rents Usage



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Thank you



The Office Sector
Debt Finding Gap



The Rise and Fall of Office to Multifamily
Conversions: A Real Estate Investigation



CBRE Econometric Advisors Develops
Office Taking Rent Series



FOR MORE INFORMATION

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