



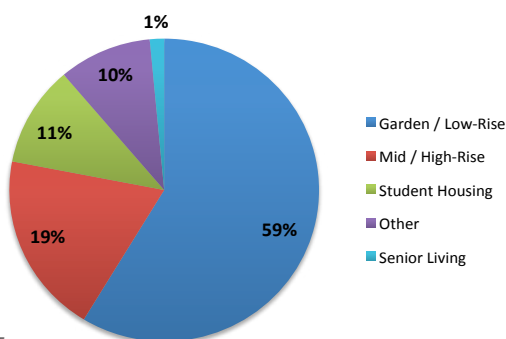
What Factors Have Driven Multifamily NOI Growth?

As the affordability of single-family homes continues to decline and shifts in preferences for renting over homeownership increases, multifamily CMBS remains to be one of the CRE sectors showcasing the strongest growth in recent years. Particular submarkets and subtypes have been benefitting from current geographic and demographic changes, as well as emerging trends in population migration. To determine the effect of shifting market factors on the property type's performance, we ran an analysis on the net operating income (NOI) levels of outstanding multifamily loans and segmented our results by property subtype, geographic region, occupancy, and agency and non-agency performance.

In the non-agency space, multifamily collateral currently backs about \$43.2 billion in CMBS loans, which comprises 8.52% of the private-label universe by balance. A larger proportion of low-rise, garden-style apartment financing make their way into CMBS, which accounts for 59% or \$25.4 billion in outstanding loans. Mid/high-rise properties, which are seeing more and more activity from developers due to the benefits of increased unit

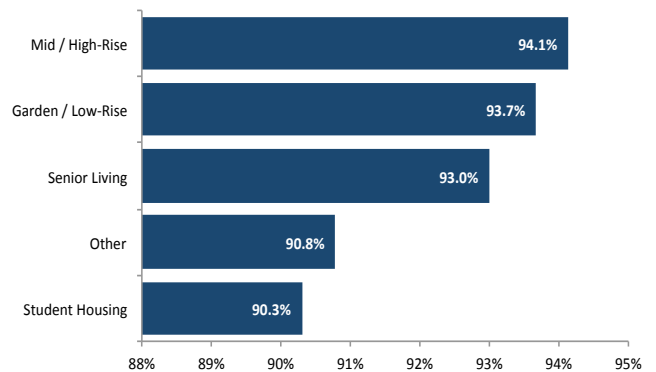
density per building, combine for \$8.4 billion or 19% of the allocated balance. Student housing (11% of allocated balance) and senior living (1%) total \$4.6 billion and \$646.2 million, respectively, while multifamily portfolio loans and those that fall outside the major subtype categories, such as mobile home or military housing, represent another \$4.2 billion or almost 10%.

FIGURE 1: MULTIFAMILY CMBS LOAN ALLOCATION BY PROPERTY SUBTYPE



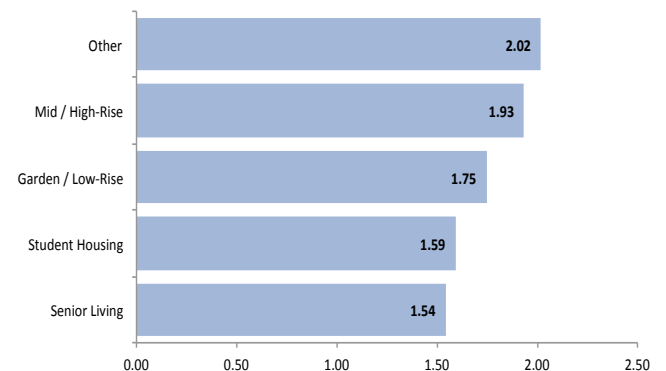
Source: Trepp

FIGURE 2: MULTIFAMILY CMBS SUBTYPE SNAPSHOT – AVERAGE OCCUPANCY



Source: Trepp

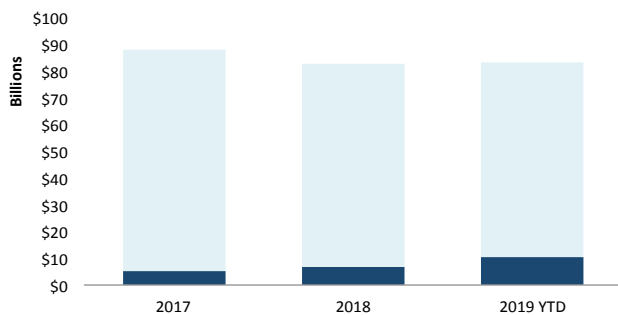
FIGURE 3: MULTIFAMILY CMBS SUBTYPE SNAPSHOT – WEIGHTED-AVERAGE DSCR (NCF)



Source: Trepp

Though GSE lenders continue to sustain their strong pace of multifamily loan purchases, the property type has been increasingly claiming a larger share of the non-agency CMBS sector over the past three years. 2019's issuance pipeline is expected to reach approximately \$10.3 billion (a 91% increase from 2017), or 12.39% of overall volume. The total from 2017 was \$5.38 billion (6.12% of total issuance) and \$6.7 billion in 2018 (8.07%). The largest new issues for this year include the \$725 million loan behind the 1,871 unit Jackson Park complex in Long Island, New York (JAX 2019-LIC) and the \$481 million MFP Portfolio (JPMCC 2019-MFP) originated to finance Chetrit Group's acquisition of a 43-property multifamily portfolio from ROCO Real Estate.

FIGURE 4: MULTIFAMILY CMBS ISSUANCE VS ALL OTHER PROPERTY TYPES

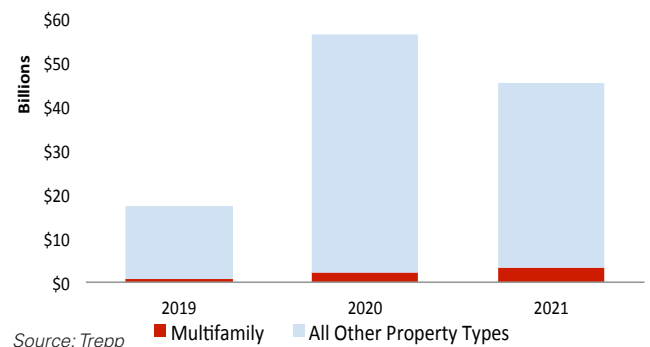


Source: Trepp

There is approximately \$773.9 million in multifamily CMBS loans that are slated to come due in 2019 that remains outstanding, an additional \$2.1 billion will mature in 2020 and \$3.4 billion worth of maturities have scheduled payoff dates in 2021. The \$450 million loan secured by the 3,165 unit Parkmerced Apartments high-rise in San Francisco, the largest loan maturing during this period, is expected to resolve timely at its November 2019 maturity date later this month. The Yorkshire & Lexington Towers luxury Manhattan housing complex, which collateralizes an outstanding balance of \$400

million across six 2017-2018 conduit deals, is another block-sized single-borrower transaction that will be up for refinancing in 2022.

FIGURE 5: CMBS MATURITIES THROUGH 2021 FOR MULTIFAMILY VS ALL OTHER PROPERTY TYPES



Source: Trepp

FIGURE 6: 10 LARGEST MULTIFAMILY MSAS BY CMBS BALANCE

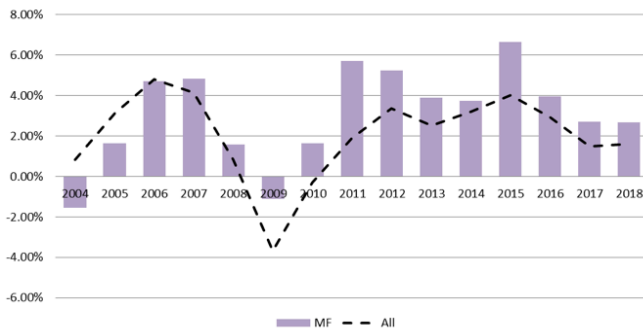
MSA NAME	TOTAL BALANCE (\$ BLN)	AVG. OCCUPANCY
New York-Newark-Jersey City, NY-NJ-PA	4,993,990,110	95.56%
Houston-The Woodlands-Sugar Land, TX	2,948,772,922	91.91%
Dallas-Fort Worth-Arlington, TX	1,598,596,744	92.40%
Detroit-Warren-Dearborn, MI	1,557,555,096	94.27%
San Francisco-Oakland-Hayward, CA	1,253,942,724	97.48%
Los Angeles-Long Beach-Anaheim, CA	1,242,283,767	96.01%
Chicago-Naperville-Elgin, IL-IN-WI	959,283,951	93.35%
Atlanta-Sandy Springs-Roswell, GA	952,850,694	93.24%
Washington-Arlington-Alexandria, DC-VA-MD-WV	865,541,582	92.41%
Austin-Round Rock, TX	862,994,148	91.74%

Source: Trepp

Multifamily CMBS has maintained the strongest momentum of growth in the years following the financial crisis; more than any other property sector. Based on monthly remittance data, the average annual occupancy on outstanding multifamily loans trended up modestly in 2018 when compared to 2017, while the overall occupancy for all property types posted a year-over-year dip. The average occupancy for the multifamily sector rose by 10 basis points to 93.49% in 2018 after three

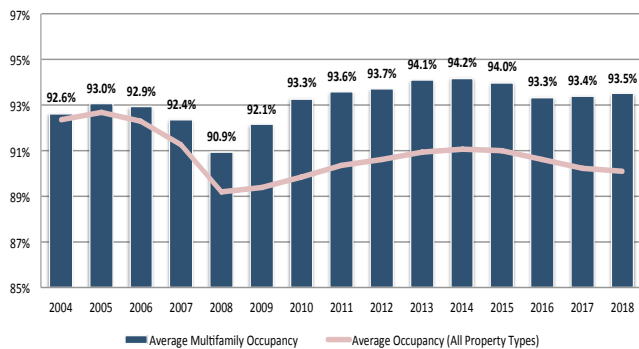
consecutive years of declines. In contrast, the overall occupancy rate for all property types has continually deteriorated since 2015 and came in at 90.10% last year, which is the lowest percentage since 2010. In terms of reported NOI: multifamily operating income grew by 2.66% in 2018 (roughly in line with 2017's annual increase of 2.70%), the highest among the five major property types behind only industrial's 3.2% growth rate. By comparison, the percentage for all property sectors was 1.62% last year, up slightly from 1.48% in 2017. This bodes well for multifamily operators that saw an increase in occupancy and operating income in 2019 which should translate to higher market valuations of those assets.

FIGURE 7: YEAR-OVER-YEAR MULTIFAMILY CMBS NOI GROWTH



Source: Trepp

FIGURE 8: AVERAGE MULTIFAMILY CMBS OCCUPANCY



Source: Trepp

Geographic Breakdown

For a closer look at the sector's performance by geographic region, Trepp examined its database of consecutive year-end financials on 23,479 private-label multifamily loans across the nine census divisions delineated by the US Census Bureau. The average percentage change in annual NOI was computed as a growth index indicator with a starting year of 2004 and a base value of 100 as a measure of the property type's performance over time.

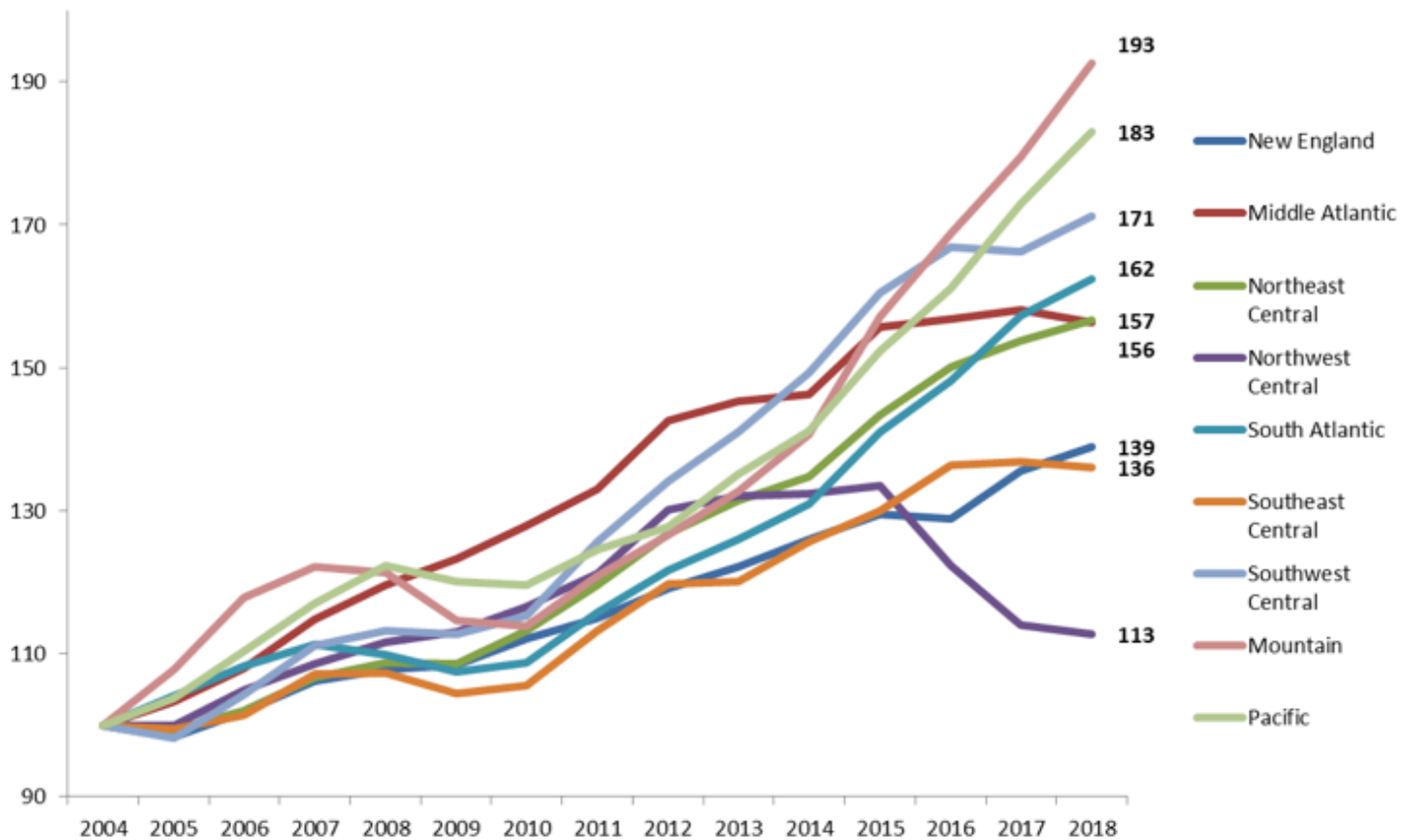
Overall, Western and Southern US regions continue to exhibit the highest growth due to current migration patterns, one of the major drivers of housing demand. For the period between July 2017 and July 2018, the US Census Bureau notes that West coast's population rose by 1.2 million (+0.87%) while the South (+0.93%) added 673,677 residents, compared to a combined 191,112 gain for the Northeast (0.07%) and Midwest (0.22%). In particular, half of the eight Mountain states (Arizona; Colorado; Idaho; Montana; New Mexico; Nevada; Utah; and Wyoming) ranked among the top four in the country that posted the largest percentage increases in population for this time period, with Idaho and Nevada tying for first (2.1% population growth). Utah (1.9%) and Arizona (1.7%) placed third and fourth, respectively, while southern states including Florida (1.5%), Texas (1.3%), and South Carolina (1.3%) represented other spots in the top ten, above the national average of 0.62%. A large part of the new resident inflow to these areas resulted from higher-than-average birth rates and the domestic relocation of retiring baby boomers and recent college graduates seeking warm weather and better accommodation options.

These population trends, which are usually reflective of strong local economies and healthy job markets, have translated to faster operating income improvements in the multifamily CMBS space for Western and Southern areas. For the 2018 fiscal year, average growth for the Mountain US clocked in at 7.33%, far outpacing that of all other geographic areas in the country, while Pacific

states (Alaska; California; Hawaii, Oregon; Washington) logged a 5.77% gain after a 7.42% increase in 2017; the highest rate among the nine regions for that year. Growth remains elevated in the Pacific despite the ongoing housing affordability crisis in thriving tech and urban locales within California and Washington, meanwhile Mountain housing markets are still rebounding after a delayed recessionary recovery period. Similarly, the South Atlantic (3.31%) and Southwest Central (2.96%)

were the only other regions with growth above 2.5% in the past year thanks to a temporary boost from disaster-affected CRE segments that are slowly stabilizing during the rebuilding phase. In contrast, reported NOIs for the Middle Atlantic (-1.07%), Northwest Central (-1.05%), and Southeast Central (-0.65%) have contracted year over year as industry-specific downsizing, paired with demographic and regional dynamics, have contributed to a slight deceleration or softening.

FIGURE 9: NOI GROWTH INDEX BY US REGION



Source: Trepp

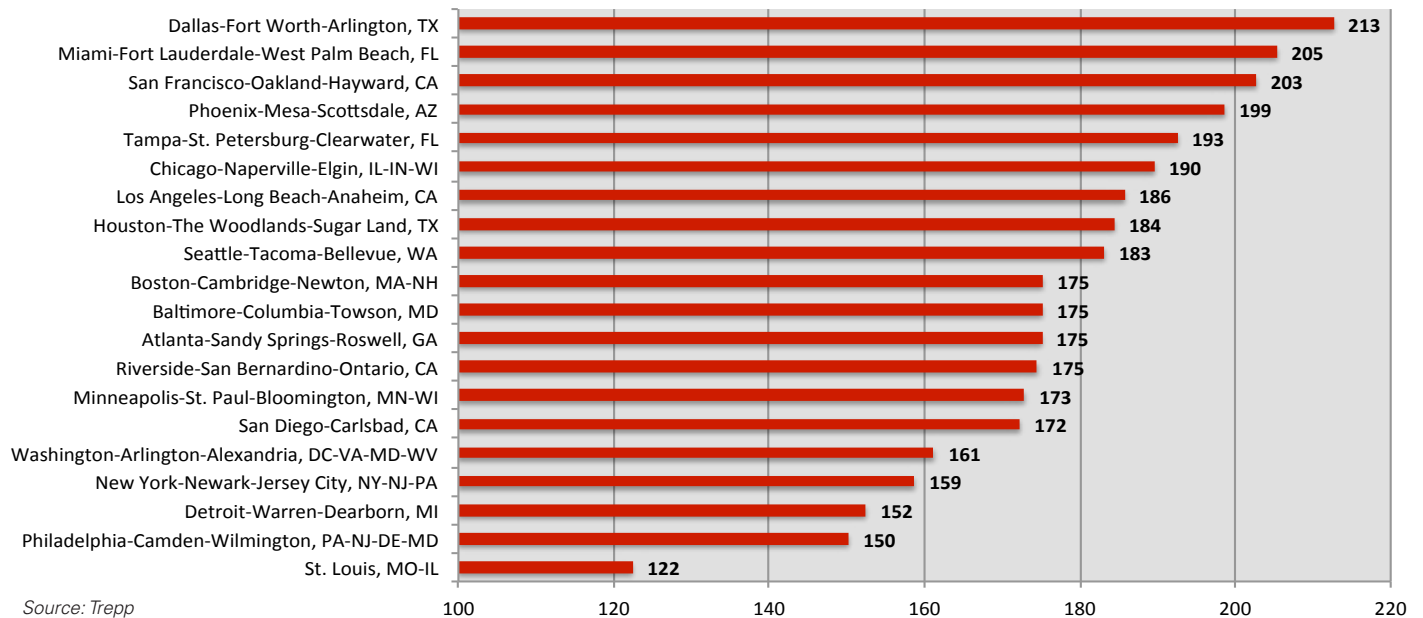
*Growth Index values were calculated with starting year=2004 and base value= 100

FIGURE 10: YEAR-OVER-YEAR MULTIFAMILY CMBS NOI GROWTH BY US REGION

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
New England	-2.06%	-1.58%	3.51%	4.29%	1.53%	0.45%	3.50%	2.46%	3.70%	2.53%	3.14%	2.78%	-0.49%	5.16%	2.52%
Middle Atlantic	-1.02%	3.30%	4.54%	6.36%	4.15%	3.00%	3.86%	3.98%	7.18%	1.94%	0.63%	6.49%	0.62%	0.87%	-1.07%
Northeast Central	-3.83%	-0.65%	2.70%	4.48%	2.07%	-0.15%	4.16%	5.68%	5.97%	3.73%	2.56%	6.38%	4.65%	2.42%	1.92%
Northwest Central	-3.75%	-0.02%	4.86%	3.61%	2.77%	1.24%	3.17%	3.96%	7.31%	1.50%	0.23%	0.86%	-8.38%	-6.77%	-1.05%
South Atlantic	-0.78%	4.13%	3.98%	2.73%	-1.21%	-2.21%	1.17%	6.46%	5.09%	3.62%	3.94%	7.58%	5.20%	6.06%	3.31%
Southeast Central	1.17%	-0.59%	1.94%	5.72%	0.13%	-2.59%	0.95%	7.30%	5.81%	0.27%	4.65%	3.40%	4.87%	0.44%	-0.65%
Southwest Central	-6.40%	-1.79%	6.15%	6.64%	1.85%	-0.44%	2.24%	9.03%	6.75%	5.09%	5.95%	7.48%	4.00%	-0.44%	2.96%
Mountain	0.18%	7.72%	9.34%	3.75%	-0.70%	-5.57%	-0.66%	6.14%	4.84%	4.78%	6.02%	11.72%	7.40%	6.30%	7.33%
Pacific	2.86%	3.84%	6.22%	6.13%	4.53%	-1.82%	-0.41%	4.08%	2.59%	5.82%	4.38%	7.99%	5.72%	7.42%	5.77%

Source: Trepp

FIGURE 11: NOI GROWTH INDEX FOR TOP 20 MSAS (2004-2018)



Source: Trepp

Among the 20 largest metropolitan statistical areas by population size, the San Francisco, CA; Minneapolis, MN-WI; Riverside, CA; and Phoenix, AZ MSAs were the top performers with double-digit growth rates for 2018. Apartment income levels for these CBDs are backed by supply constraints and demand from a diverse group of millennial renters who, burdened by student loans

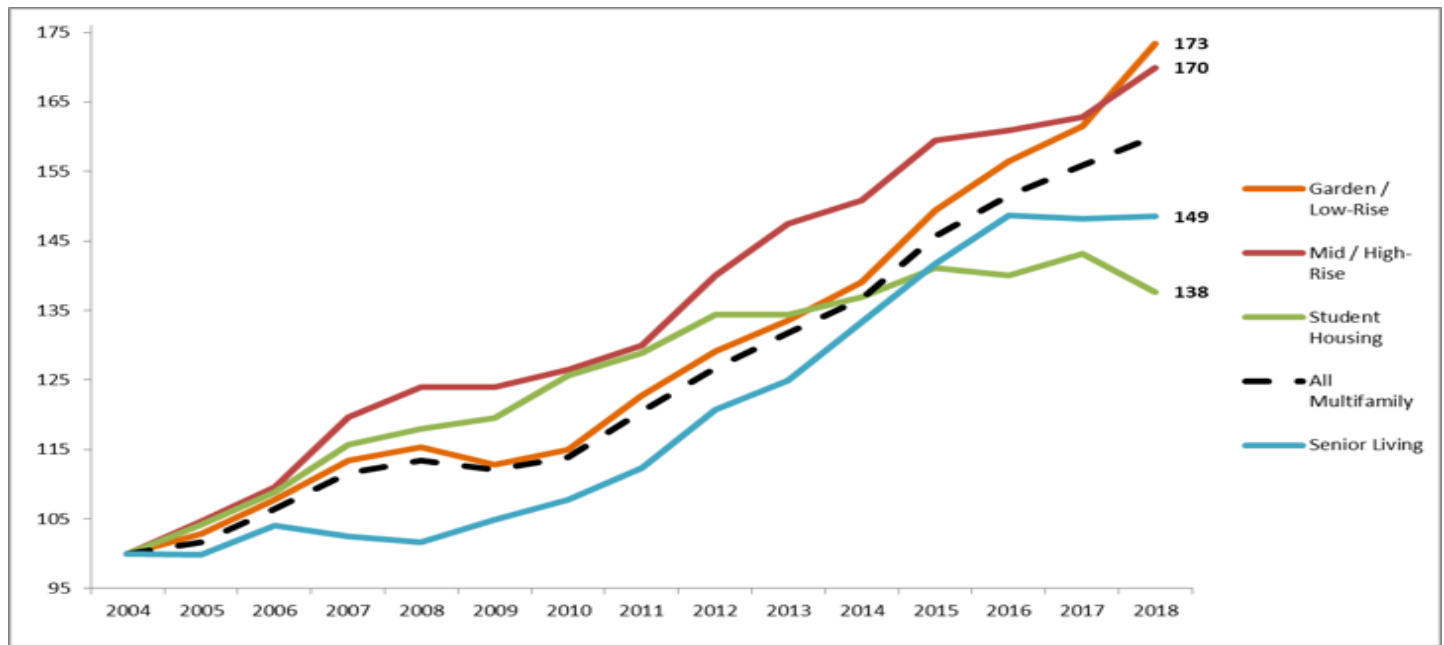
and expensive living costs, are finding homeownership increasingly difficult. The Dallas, TX and Miami, FL metros maintain their top two positions with growth indexes of 205 and 213 for the 2004 to 2018 period, respectively, as advanced STEM and construction employment opportunities, coupled with more affordable living conditions continually attract new occupants.

FIGURE 12: NOI GROWTH INDEX FOR TOP 20 MSAS (2004-2018)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
New York-Newark-Jersey City, NY-NJ-PA	-0.94%	4.71%	6.27%	7.52%	3.95%	1.79%	2.72%	2.65%	7.63%	3.08%	1.45%	7.95%	-5.63%	4.01%	-0.31%
Los Angeles-Long Beach-Anaheim, CA	4.24%	5.57%	6.38%	6.29%	4.33%	-2.14%	-1.51%	1.86%	2.14%	8.62%	3.70%	8.21%	4.53%	11.37%	4.82%
Chicago-Naperville-Elgin, IL-IN-WI	-3.87%	7.44%	4.82%	7.37%	5.38%	3.99%	4.03%	4.34%	5.13%	0.02%	1.71%	8.62%	9.12%	1.31%	2.63%
Dallas-Fort Worth-Arlington, TX	-8.91%	-4.73%	6.08%	9.50%	3.24%	0.26%	-0.63%	11.33%	9.23%	9.00%	5.63%	10.70%	11.41%	6.09%	1.99%
Houston-The Woodlands-Sugar Land, TX	-10.37%	-4.25%	6.79%	2.30%	-1.46%	-1.87%	-2.20%	13.73%	8.17%	10.75%	14.68%	12.29%	7.41%	-3.56%	2.59%
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	-4.45%	0.01%	5.04%	3.35%	2.57%	1.25%	3.45%	7.43%	6.19%	4.13%	2.35%	2.76%	5.64%	1.41%	-3.78%
Washington-Arlington-Alexandria, DC-VA-MD-WV	1.77%	6.53%	3.70%	3.72%	3.62%	2.82%	6.03%	5.69%	9.79%	4.47%	-0.22%	9.21%	4.76%	5.65%	-14.80%
Miami-Fort Lauderdale-West Palm Beach, FL	0.19%	1.43%	5.14%	6.33%	0.26%	-1.97%	12.52%	10.92%	8.99%	4.10%	12.80%	9.42%	5.17%	2.29%	-2.02%
Atlanta-Sandy Springs-Roswell, GA	-6.22%	1.03%	5.41%	2.62%	-4.61%	-4.83%	-5.02%	2.85%	7.88%	5.26%	7.07%	12.65%	13.93%	9.03%	6.18%
Boston-Cambridge-Newton, MA-NH	-6.46%	-2.66%	4.08%	7.80%	5.18%	2.02%	2.00%	3.12%	5.99%	4.60%	0.81%	4.29%	8.23%	7.98%	4.36%
San Francisco-Oakland-Hayward, CA	-2.12%	2.03%	5.29%	5.43%	6.89%	1.16%	-0.26%	4.03%	4.93%	5.08%	6.52%	4.15%	5.81%	1.12%	21.86%
Phoenix-Mesa-Scottsdale, AZ	1.77%	13.02%	16.65%	-1.02%	-11.40%	-14.12%	-9.13%	10.58%	7.15%	7.95%	5.96%	21.77%	12.38%	4.81%	13.24%
Riverside-San Bernardino-Ontario, CA	15.67%	2.08%	9.06%	1.67%	-1.34%	-6.34%	-1.70%	1.15%	2.94%	-3.86%	7.80%	21.07%	0.30%	14.03%	13.63%
Detroit-Warren-Dearborn, MI	-5.56%	-6.67%	-2.92%	-0.48%	-0.77%	-3.09%	3.50%	7.75%	14.34%	5.28%	4.27%	8.43%	8.25%	1.31%	5.63%
Seattle-Tacoma-Bellevue, WA	0.79%	5.63%	11.25%	8.51%	8.35%	-5.85%	-2.37%	6.66%	2.77%	6.61%	1.83%	7.23%	7.60%	4.77%	0.23%
Minneapolis-St. Paul-Bloomington, MN-WI	-3.35%	-0.95%	8.15%	10.18%	3.44%	-2.20%	3.54%	4.43%	6.66%	0.23%	2.21%	8.22%	-2.60%	1.75%	14.26%
San Diego-Carlsbad, CA	3.64%	3.96%	2.73%	3.56%	2.44%	2.95%	-1.96%	5.04%	3.82%	0.54%	3.14%	3.37%	8.93%	9.31%	8.20%
Tampa-St. Petersburg-Clearwater, FL	1.71%	5.95%	2.80%	0.74%	-4.70%	-1.50%	4.64%	9.69%	1.42%	9.72%	8.25%	10.81%	6.82%	4.14%	9.70%
St. Louis, MO-IL	-2.23%	2.07%	2.18%	1.10%	0.43%	3.05%	7.49%	2.70%	4.20%	-4.77%	-0.77%	3.00%	3.81%	-1.49%	-1.99%
Baltimore-Columbia-Towson, MD	-2.62%	-0.45%	1.59%	1.81%	1.65%	3.23%	0.31%	9.87%	3.90%	7.03%	1.84%	21.30%	1.25%	3.31%	2.36%

Source: Trepp

FIGURE 13: NOI GROWTH INDEX BY MULTIFAMILY SUBTYPE



Source: Trepp

FIGURE 14: YEAR-OVER-YEAR NOI GROWTH BY MULTIFAMILY SUBTYPE

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Garden / Low-Rise	-0.02%	2.89%	4.73%	5.28%	1.63%	-2.19%	1.95%	6.81%	5.17%	3.45%	4.13%	7.35%	4.80%	3.18%	7.39%
Mid / High-Rise	1.52%	4.71%	4.59%	9.26%	3.61%	0.03%	1.96%	2.78%	7.77%	5.27%	2.30%	5.70%	0.94%	1.18%	4.39%
Student Housing	-5.32%	4.13%	4.52%	6.30%	1.96%	1.29%	5.13%	2.62%	4.30%	0.00%	1.82%	3.12%	-0.80%	2.25%	-3.83%
Senior Living	0.97%	-0.11%	4.18%	-1.47%	-0.85%	3.13%	2.85%	4.21%	7.42%	3.48%	6.71%	6.34%	4.87%	-0.32%	0.26%
All Multifamily	-1.54%	1.63%	4.72%	4.85%	1.58%	-1.12%	1.65%	5.73%	5.24%	3.90%	3.75%	6.64%	3.97%	2.90%	2.69%

Source: Trepp

Generally speaking, 2018's results broken out by subtype classification were largely in line with what was expected. Low-rise, garden-style apartments, which have pipeline restrictions from expensive building needs on a per unit basis and higher barriers of entry, experienced accelerated rent growth last year that supported its 7.39% growth rate. The mid to high-rise segment recorded an increase of 4.39%, helped by favorable rental rates in densely populated urban centers, where these structures are typically concentrated, and its generally higher-income renter community.

Specialized housing options, such as those catered to the elderly and student populations, are heavily influenced by demand fluctuations from cyclical changes and inventory competition and are therefore, more limited in their growth potential. 2018 income levels for senior living apartments held relatively stagnant year over year at 0.26% after a -0.32% slide in 2016. Student housing (-3.83%) remains to be one of the riskier-perceived subtypes due to campus oversaturation, higher turnover and renovation/maintenance costs (from greater-than-average unit "wear and tear" attributed to a younger tenant base), and the leveling or downtick in matriculants heavily impacts vacancy and pricing. The sector bears close monitoring with its special servicing and distress rates notably above the rest of the multifamily space, as a number of recent vintage loans secured by Aspen Heights and Monarch-branded student apartment projects are already in default. Though more than 80% were issued in 2014 or after, 10% of the \$4.6 billion in non-agency student housing loans are in special servicing while roughly 25% have been placed on servicer Watchlist.

***Editor's Note:** Additional fiscal year financials for 2017 have been provided through servicer remittance data since the last time we published our multifamily report titled "Can Multifamily Continue to Outperform Other Property Types" in October 2018. The latest version of

our analysis has been updated to include these additional data points so the numbers may not match those found in our previous research release.

AFTERWORD ON GSE FINANCIAL PERFORMANCE

In the agency space, we examined 2017 and 2018 financials reported for loans backed by GSE lending programs in Trepp's database, which covers \$739.8 million in outstanding mortgages across 70,929 loans. (Our overall coverage spans more than \$1.1 billion in agency loan originations across roughly 170,000 loans.)

FIGURE 15: GSE LOAN SNAPSHOT

LENDING SOURCE/ PROPERTYTYPE	LOAN COUNT	ORIGINAL BALANCE	CURRENT BALANCE
Fannie Mae	50,364	\$416,326,683,226	\$325,884,519,157
CH	1,400	\$4,656,281,253	\$2,978,966,479
MF	46,522	\$396,863,495,553	\$310,918,558,951
MH	2,438	\$14,786,471,420	\$11,974,712,169
SE	4	\$20,435,000	\$12,281,558
FHA	74,608	\$207,021,084,369	\$10,422,613,401
HC	10,142	\$32,992,445,428	\$688,699,697
MF	36,630	\$89,633,139,012	\$9,667,820,673
MH	129	\$164,289,297	\$2,633,261
OT	27,707	\$84,231,210,632	\$63,459,770
Freddie Mac	28,920	\$368,533,087,815	\$273,428,493,936
CH	103	\$1,194,735,000	\$1,099,451,007
MF	28,422	\$363,574,878,315	\$268,860,590,719
MH	395	\$3,763,474,500	\$3,468,452,209
Ginnie Mae	15,648	\$130,502,867,168	\$130,879,915,061
HC	2,977	\$31,017,160,875	\$28,430,577,761
MF	12,477	\$97,603,812,735	\$100,587,207,961
MH	2	\$9,654,608	\$9,022,795
OT	192	\$1,872,238,951	\$1,853,106,545
Grand Total	169,540	\$1,122,383,722,579	\$740,615,541,554

Source: Trepp

* Based on Trepp's agency lending database/coverage

FIGURE 16: FANNIE MAE – 2017 VS 2018 FINANCIAL PERFORMANCE

MULTIFAMILY SUBTYPE	2018 - AVERAGE OCCUPANCY	2017 - AVERAGE OCCUPANCY	YOY % CHANGE IN NCF	NCF PER UNIT
Apartments/Coops	92.7%	95.3%	3.5%	\$7,452
Manufactured	94.6%	96.2%	4.9%	\$4,599
Military Housing	93.8%	94.1%	5.7%	\$6,782
Senior Living	84.5%	87.2%	-3.9%	\$14,777
Student Housing	93.8%	93.8%	-2.8%	\$11,350

Source: Trepp

FIGURE 17: FREDDIE MAC – 2017 VS 2018 FINANCIAL PERFORMANCE

MULTIFAMILY SUBTYPE	2018 - AVERAGE OCCUPANCY	2017 - AVERAGE OCCUPANCY	YOY % CHANGE IN NCF	NCF PER UNIT
Garden / Low-Rise	95.0%	94.9%	3.0%	\$8,139
Mid / High-Rise	95.9%	95.5%	2.4%	\$12,577
Military Housing	94.2%	92.2%	-2.3%	\$6,152
Mobile Home	93.3%	92.3%	5.5%	\$3,626
Other	95.7%	95.3%	-1.7%	\$8,337
Senior Living	90.6%	91.7%	-1.7%	\$11,251
Student Housing	92.2%	93.8%	-2.9%	\$6,727

Source: Trepp

*Financials for agency lenders are reported in net cashflow terms (NCF), which differs from the rest of this report.

For additional NOI analysis research reports on other property types, contact info@trepp.com.

For inquiries about the data analysis conducted in this research, contact press@trepp.com or 212-754-1010.

About Trepp

Trepp, founded in 1979, is the leading provider of information, analytics and technology to the CMBS, commercial real estate and banking markets. Trepp provides primary and secondary market participants with the web-based tools and insight they need to increase their operational efficiencies, information transparency and investment performance. From its offices in New York, San Francisco and London, Trepp serves its clients with products and services to support trading, research, risk management, surveillance and portfolio management. Trepp is wholly-owned by Daily Mail and General Trust (DMGT).

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