



# CWC Capital Markets Update

## Fourth Quarter 2018

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- Economy: Continued positive employment and economic trends, but deficits growing quickly
- Cyclical highs in property prices, volatility, and negative fundamentals
- Feature – CRE CLO Market – Tiering and Pricing
- Three trends we are watching

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This CWCapital Markets Update focus's on the fundamentals and trends affecting national commercial real estate debt markets. We synthesize and present information gathered from various industry research, public resources, and our own research.

## THE ECONOMY

- **The December jobs report** noted that the economy continues to grow with 312,000 jobs created in December. Employment in the professional and business services category again led with 583,000 jobs created over the past year, leading both healthcare (346,000), and manufacturing (284,000). Retail added only 92,000 jobs.
- **The unemployment rate** rose to 3.9%, still among the lowest level in decades. The participation rate ticked up slightly to 63.1%. For December, BLS noted that unemployment dropped in 64% of all MSAs year over year, with 89 MSAs at <3.0% unemployment and 3 over 10%. Ames Iowa, Iowa City, parts of Utah and New Hampshire MSAs have <2.0% unemployment, while El Centro CA, Yuma AZ, Puerto Rico, and Ocean City NJ have > 10%.
- **The 10-year US Treasury yield** at 2.67% tightened almost 50bps since early November. Much of the tightening was related to overall concerns about equity prices, trade, and other uncertainty. The 2/10 spread is 17bps, continuing the now long-term flattening trend. Historically, inverted yield curves can signal an economic slowdown. The US budget deficit rose 17% in 2017 to \$779 bn and may grow an additional 15% reaching \$897 bn in 2018 according to a CBO report. Combined with lower tax revenues, rapid increases in the deficit, and trade tensions, we remain concerned about rising rates and real estate price weakness on the horizon.

## PROPERTY MARKETS

- **Effective rent growth** – National average now showing a stronger 3.27% one year growth rate, in line with the 5 year average. Multi-family rents grew 4.3% for the year, while retail growth continues to lag at 2.1%.
- **Vacancy rates** – For the trailing 1-yr period, vacancy rates increased for all property types, (20 to 120bp). Although deliveries grew in all categories (except retail) over 2017's pace, absorption for all asset classes was less than 1.0x. This is the first time that all categories were negative in the past 15 years. We expect continued vacancy increases across all categories as heavy construction pipelines in multi-family and warehouse property types are delivered.
- **National property** prices for multi-family increased by 7.2% on a rolling 3-year basis, while retail properties lost 2.49%. Also on a 3-year basis, retail has lost value per unit nearly every month for the past 2 years.

## DEBT CAPITAL MARKETS

- **Credit spreads** widened at year end amid overall market volatility. CMBS BBB- widened by 73bps for the year, with the vibrant CRE CLO market coming to a complete standstill at year end. YTD18 CMBS conduit issuance of \$40.4bn is off last year's levels by over 18%. Competing products such as FHLMC (\$69bn), SASB (\$34bn), CRE-CLO (\$14bn), and balance sheet lenders continue to take market share.
- **CMBS risk retention pricing** – Horizontal subordinates in the 14% area, L-shaped subordinates in the 18% area.
- **Conduit delinquency rates** dropped to 1.92% this month. Majority of delinquencies remain in 06/07 vintages.

## THREE TRENDS WE ARE WATCHING

- **Cyclical highs in property prices** – all property types experiencing price volatility at national level. Negative absorption and heavy delivery pipelines. Multifamily and industrial building on a very robust pace.
- **Rising Interest Rates** – growing deficit, tax policy, trade tensions may balloon deficits, spike rates, impact values.
- **Increased leverage / easing standards** – over-levered loan products finding their way into rated securitizations.

## FEATURE – CRE CLO Market – Tiering and Pricing

This quarter, we feature a review of current trends in the US CRE CLO market. At over \$13bn via 25 deals, 2018's market issuance was more than double that of 2017. With activity and volume this robust, it is critical for investors to evaluate basic collateral risk, credit quality, CLO structural features, and to benchmark their required yields accordingly.

CRE CLOs generally finance an originator's short-term floating rate loan production. The loans are on transitional properties, may contain future funding commitments, are usually interest only with 2-3yr terms, and 2 or 3 one-year extension options. CLOs may contain future funding components from loans in other CLOs. The transaction may contain static collateral combined with bond interest coverage and/or over-collateralization performance tests (SWT), may allow the manager to reinvest loan principal payments (RWT), or may simply be a static pool with no bond performance triggers (Static). The triggers are designed for senior bond investor protection via structural cash sweeps.

In the chart below, we compared 2018's issuance in each category (SWT, RWT, Static) and noted the following:

- Capital structure advance rates for the investment grade, below investment grade, and equity bonds were similar at 79%, 9%, and 12% for both Trigger and Managed Deals.
- Underlying appraisal LTVs and loan spreads were similar at 68% and 423bps in both SWT and RWT deals.
- Investment grade bondholders (thru BBB-) appear to require both a 25bp premium and interest coverage tests for the uncertainty of a managed reinvestment deal. This ultimately reduces spread for below investment grade and equity holders for the same risk. Since the manager and the equity are often the same party, this may also be viewed as the cost of access to longer and more flexible funding.

Issued	Deal	Issued	Issuer	Svcr	SS	Feature	IC Test	OC Test	Appr LTV	Wtd Avg Loan Spread	Adv Rate Inv Gr Bonds	Adv Rate BB/B Bonds	Equity	Wtd Spread Inv Gr	Wtd Spread BB/B	
Jan-18	VMC 2018-FL1	368.09	Varde	Trimont	Trimont	SWT	-	1.21	74.60%	7.00%	520	0.78	0.09	0.13	128	555
Feb-18	TRTX 2018-FL1	932.38	TPG	WF	Situs	SWT	-	1.19	63.40%	6.70%	404	0.80	0.08	0.12	108	700
Feb-18	BDS 2018-FL1	510.23	Bridge	WF	WF	SWT	-	1.27	74.30%	6.50%	455	0.74	0.09	0.17	120	705
Feb-18	AREIT 2018-CRE1	480.38	Silverpeak	WF	Cohen	SWT	-	1.17	67.60%	7.60%	436	0.80	0.07	0.12	125	685
Apr-18	GPMT 2018-FL1	826.57	Granite Pt	WF	Trimont	SWT	-	1.19	65.80%	7.50%	415	0.80	0.09	0.11	127	703
Jun-18	XAN 2018-RSO6	514.23	RCC RealEst	C-III	C-III	SWT	-	1.21	72.30%	6.80%	402	0.79	0.08	0.14	112	455
Jun-18	RCMT 2018-FL2	278.28	ReadyCap	KeyBank	LNR	SWT	1.20	1.27	68.09%	5.33%	484	0.78	0.09	0.13	121	608
Jul-18	SGCP 2018-FL1	415.13	Shelter Gr	WF	WF	SWT	1.20	1.23	69.10%	6.80%	499	0.78	0.08	0.14	138	577
Jul-18	BDS 2018-FL2	420.02	Bridge	WF	WF	SWT	1.20	1.29	71.70%	7.90%	390	0.75	0.09	0.16	126	454
Oct-18	VMC 2018-FL2	462.30	Varde	Trimont	Trimont	SWT	-	1.17	70.00%	7.10%	403	0.81	0.08	0.12	122	513
Oct-18	AREIT 2018-CRE2	596.31	Silverpeak	WF	Cohen	SWT	-	1.18	76.40%	6.10%	388	0.80	0.07	0.12	125	411
Nov-18	TRTX 2018-FL2	1,000.17	TPG	Situs	Situs	SWT	1.20	1.25	65.90%	7.40%	404	0.79	0.08	0.13	145	437
		<b>6,804.09</b>							<b>69.09%</b>	<b>6.97%</b>	<b>424</b>	<b>0.79</b>	<b>0.08</b>	<b>0.13</b>	<b>125</b>	<b>570</b>
Mar-18	BSPRT 2018-FL3	610.00	Benefit St	Situs	Situs	RWT	1.20	1.24	63.40%	8.20%	433	0.80	0.10	0.11	148	555
May-18	LNCR 2018-CRE1	1,052.91	LoanCore	Situs	Situs	RWT	1.20	1.24	67.60%	6.40%	460	0.79	0.08	0.13	154	583
May-18	ARCLO 2018-FL1	560.00	Arbor	Arbor	Arbor	RWT	1.20	1.26	69.70%	6.10%	447	0.79	0.10	0.12	145	563
Jun-18	MACRE 2018-FL1	470.00	Marathon	KeyBank	Marathon	RWT	1.20	1.31	65.10%	6.80%	447	0.76	0.09	0.15	160	583
Aug-18	HUNTC 2018-FL2	285.00	Hunt Mtg	KeyBank	Hunt Mtg	RWT	1.20	1.25	74.30%	7.10%	406	0.77	0.08	0.15	144	586
Sep-18	BSPRT 2018-FL4	868.39	Benefit St	Situs	Situs	RWT	1.20	1.23	71.10%	7.10%	385	0.81	0.08	0.11	143	498
Nov-18	KREF 2018-FL1	1,000.00	KKR	Midland	Midland	RWT	1.20	1.17	68.50%	6.40%	347	0.81	0.08	0.11	136	434
Nov-18	ORIX 2018-CRE1	350.00	ORIX	RED Mtg	RED Mtg	RWT	1.20	1.25	65.00%	6.00%	448	0.79	0.09	0.12	153	445
Nov-18	FORT CRE 2018-1	600.00	Fortress	WF	Fortress	RWT	1.20	1.29	63.20%	6.80%	473	0.77	0.09	0.14	180	555
		<b>5,796.30</b>							<b>67.55%</b>	<b>6.75%</b>	<b>422</b>	<b>0.79</b>	<b>0.09</b>	<b>0.12</b>	<b>150</b>	<b>529</b>
Mar-18	BANC 2018-CR3	304.27	Bancorp	WF	Trimont	Static	-	-	69.10%	8.50%	410	0.86	0.08	0.06	119	655
Sep-18	BANC 2018-CRE4	341.00	Bancorp	WF	Trimont	Static	-	-	71.70%	10.10%	371	0.81	0.10	0.09	116	499
		<b>645.27</b>							<b>70.47%</b>	<b>9.35%</b>	<b>389</b>	<b>0.83</b>	<b>0.09</b>	<b>0.08</b>	<b>118</b>	<b>573</b>
<b>Total</b>		<b>13,245.65</b>							<b>68.49%</b>		<b>422</b>	<b>0.79</b>	<b>0.08</b>	<b>0.12</b>	<b>136</b>	<b>552</b>



## FEATURE – CRE CLO Market – Tiering and Pricing (cont.)

- Regarding the static deals, interesting to note that they contain the lowest loan spread (on a comparative basis), the highest LTV on an “as is” appraised basis, the highest investment grade advance rate (83%), the lowest nominal pay spread, and no bond performance triggers. Structurally, some of the excess interest may be paid to certain IG bonds however. Investors should conduct additional collateral level diligence to more fully explain the pool level dynamics described above.

Since CLO floaters generally price at par, bond pay spreads to LIBOR can be used as a proxy for required yield. 2018’s results are shown below by category. At a more granular level, average spreads between trigger-only and managed reinvestment deals are 30-40bps for AAA, AA and A classes, while BBB- classes have only a 15bp concession.

The below investment grade bonds in managed reinvestment deals have less than half the spread volatility of trigger-only deals. Note the consistency and stability of cost of funds at an average of L+500 and L+650 for BB and B bonds in those deals. Managed reinvestment BB and B spread volatility is also slightly less than that associated with risk retention portions of traditional CMBS conduit deals.

As the market and investment options continue to grow, identifying and analyzing tiering and pricing trends is critical for investors to differentiate among the multiple options. When deals are put into context, the critical work of loan level diligence can begin.

### Feature: Static with Coverage Tests

Class	VMC 2018-FL1	TRTX 2018-FL1	BDS 2018-FL1	AREIT 2018-CRE1	GPMT 2018-FL1	XAN 2018-RSO6	RCMT 2018-FL2	SGCP 2018-FL1	BDS 2018-FL2	VMC 2018-FL2	AREIT 2018-CRE2	TRTX 2018-FL2
Issued	Jan-18	Feb-18	Feb-18	Feb-18	Apr-18	Jun-18	Jun-18	Jul-18	Jul-18	Oct-18	Oct-18	Nov-18
AAA-Last	120	95	85	125	120	83	85	100	95	115	120	145
AA-	160	130	125	165	155	115	130	150	140	135	140	165
A-	225	190	200	210	215	185	190	200	185	195	190	230
BBB-	340	270	275	310	295	250	270	300	255	275	265	270
BB-	500	600	600	575	600	400	500	500	400	475	375	400
B-	600	800	800	775	800	500	700	650	500	575	475	500

### Feature: Managed with Coverage Tests

Class	BSPRT 2018-FL3	LNCR 2018-CRE1	ARCLO 2018-FL1	MACRE 2018-FL1	HUNTC 2018-FL2	BSPRT 2018-FL4	KREF 2018-FL1	ORIX 2018-CRE1	FORT CRE 2018-1
Issued	Mar-18	May-18	May-18	Jun-18	Aug-18	Sep-18	Nov-18	Nov-18	Nov-18
AAA-Last	135	150	150	155	145	130	135	118	170
AA-	165	170	170	175	165	160	160	165	195
A-	255	255	250	260	235	210	200	230	283
BBB-	345	295	305	300	275	275	255	270	343
BB-	500	500	500	500	500	450	400	400	500
B-	650	650	650	650	650	550	500	525	650

### Static

BANC 2018-CR3	BANC 2018-CRE4
Mar-18	Sep-18
110	125
125	155
160	210
210	270
396	546
737	935

## SELECTED MARKET DATA – Economic and Real Estate Fundamentals and Trends

	2008	2013	2015	2016	2017	Q4-18	1yr	5yr	10yr
<b>Economic</b>									
UNEMP	7.30	7.00	5.00	4.70	4.10	3.90	-0.20%	-2.80%	-3.40%
PART	65.80	63.00	62.60	62.70	62.70	63.10	0.40%	0.30%	-2.70%
GDP	14,550	16,958	18,223	18,869	19,831	20,402	2.88%	4.06%	4.02%
CPI-TTM	-0.40%	1.51%	1.44%	1.91%	2.09%	0.80%	-1.29%	-1.08%	1.20%
UST IMPL INF	0.11%	2.24%	1.54%	1.95%	1.96%	1.71%	-0.26%	-0.54%	1.60%
<b>Interest Rate</b>									
1M LIBOR	1.75%	0.16%	0.43%	0.77%	1.56%	2.50%	0.94%	2.34%	0.75%
Eff Fed Funds	0.16%	0.07%	0.24%	0.50%	1.31%	2.40%	1.09%	2.33%	2.24%
Prime	3.61%	3.25%	3.37%	3.75%	4.50%	5.50%	1.00%	2.25%	1.89%
UST2	0.76%	0.38%	1.06%	1.20%	1.89%	2.49%	0.60%	2.11%	1.73%
UST10	2.25%	3.04%	2.27%	2.45%	2.40%	2.69%	0.29%	-0.36%	0.44%
2/10 Spread	1.49%	2.66%	1.21%	1.25%	0.51%	0.20%	-0.32%	-2.47%	-1.30%
Real10	2.14%	0.80%	0.73%	0.50%	0.44%	0.98%	0.54%	0.18%	-1.16%
<b>Vacancy (REIS)</b>									
Multi	6.70%	4.30%	4.40%	4.20%	4.50%	4.80%	0.40%	0.50%	-1.90%
Retail	8.90%	10.40%	10.00%	9.90%	10.00%	10.20%	0.20%	-0.20%	1.30%
Office	14.50%	16.90%	16.20%	15.80%	16.40%	16.70%	0.30%	-0.20%	2.20%
Industrial	n/a	11.60%	10.60%	10.30%	8.90%	10.20%	1.20%	-1.40%	n/a
Hotel									
<b>Rents (REIS Effective)</b>									
Multi	993	1,083	1,183	1,252	1,305	1,356	4.39%	5.00%	3.66%
Retail	17.39	16.81	17.54	17.89	18.24	18.53	2.09%	2.02%	0.66%
Office	24.61	23.50	24.97	25.93	26.43	27.04	2.93%	3.02%	0.99%
Industrial	n/a	4.36	4.55	4.66	4.96	\$5.08	3.67%	3.41%	n/a
Hotel									
<b>National \$PSF (RCA)</b>									
Multi	84,671	115,919	148,228	152,206	153,656	182,438	18.73%	11.48%	11.55%
Retail	181	178	213	200	177	197	11.19%	2.12%	0.87%
Office	200	231	239	235	241	259	7.63%	2.48%	2.99%
Industrial	63	65	73	78	79	93	16.61%	8.60%	4.70%
Hotel	89,941	129,720	138,162	153,841	143,596	158,267	10.22%	4.40%	7.60%
<b>National Cap Rate (RCA)</b>									
Multi	6.58%	6.21%	5.91%	5.70%	5.62%	5.44%	-0.17%	-0.77%	-1.14%
Retail	7.10%	6.99%	6.48%	6.52%	6.60%	6.51%	-0.09%	-0.48%	-0.58%
Office	7.26%	6.99%	6.70%	6.59%	6.73%	6.47%	-0.26%	-0.52%	-0.78%
Industrial	7.73%	7.43%	6.61%	6.80%	6.74%	6.42%	-0.32%	-1.01%	-1.31%
Hotel	9.02%	8.18%	8.38%	8.50%	8.51%	8.58%	0.07%	0.40%	-0.44%
<b>Risk Premium</b>									
Multi	4.33%	3.17%	3.64%	3.25%	3.22%	2.76%	-0.46%	-0.41%	-1.57%
Retail	4.85%	3.95%	4.21%	4.07%	4.20%	3.83%	-0.37%	-0.13%	-1.02%
Office	5.01%	3.95%	4.43%	4.14%	4.33%	3.79%	-0.54%	-0.16%	-1.22%
Industrial	5.48%	4.39%	4.34%	4.35%	4.34%	3.74%	-0.60%	-0.65%	-1.74%
Hotel	6.77%	5.14%	6.11%	6.05%	6.11%	5.89%	-0.22%	0.76%	-0.87%

# CRE FUNDAMENTALS – Property Price, Vacancy, and Rent Growth Trends

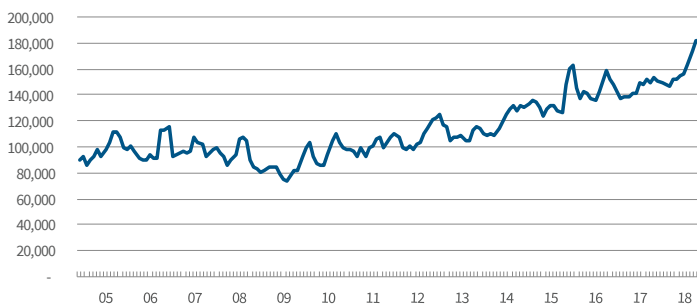
Year End	National Average price / unit				
	MF	Retail	Hotel	Ofc	Ind
2005	107,027.7	158.3	133,060.5	197.5	62.1
2006	113,416.2	174.3	136,504.5	232.4	66.7
2007	95,251.4	168.9	117,311.2	255.0	68.6
2008	84,671.0	181.3	89,940.8	199.7	63.1
2009	81,953.2	144.0	59,012.2	151.5	47.3
2010	99,502.6	152.1	138,350.5	222.2	51.3
2011	103,329.8	174.8	98,186.8	213.3	60.1
2012	120,788.9	228.0	121,202.3	225.8	62.1
2013	115,918.7	178.3	129,720.0	230.7	64.8
2014	132,159.3	198.4	134,397.7	222.6	69.3
2015	148,228.2	212.7	138,162.4	239.0	72.7
2016	152,206.0	199.6	153,841.0	234.9	77.7
2017	153,656.0	177.4	143,596.4	241.0	79.5
2018	182,437.6	197.2	158,266.9	259.4	92.7

Year End	Vacancy Trend				
	MF	Retail	Hotel	Ofc	Ind
2005	5.70	6.80	-	14.70	-
2006	5.80	7.10	-	13.40	-
2007	5.70	7.50	-	12.60	-
2008	6.70	8.90	-	14.50	-
2009	8.00	10.60	-	17.00	-
2010	6.60	11.00	-	17.60	14.00
2011	5.30	11.00	-	17.40	13.20
2012	4.60	10.70	-	17.10	12.10
2013	4.30	10.40	-	16.90	11.60
2014	4.20	10.20	-	16.70	11.20
2015	4.40	10.00	-	16.20	10.60
2016	4.20	9.90	-	15.80	10.30
2017	4.50	10.00	-	16.40	8.90
2018	4.80	10.20	-	16.70	9.40

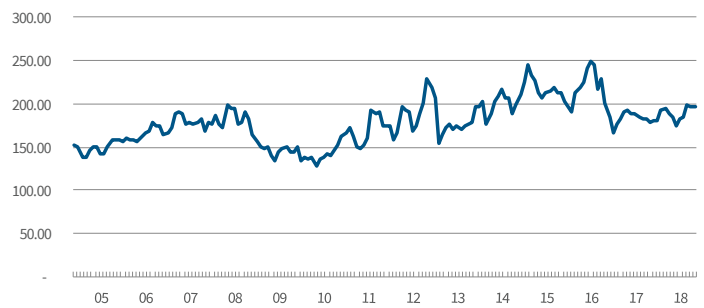
Peak	182,437.6	248.1	201,238.3	298.5	94.5
Trough	73,804.9	128.0	59,012.2	132.0	44.7
Fall fr '06	34.93%	26.55%	56.77%	43.20%	33.07%
Peak Date	Nov-18	Aug-16	Apr-15	Aug-08	Sep-18
Trough Date	Sep-09	Jun-10	Dec-09	Mar-10	Apr-10
Curr vs '06	35.5%	1.8%	5.2%	3.7%	19.1%
Curr vs Pk	-15.8%	-28.5%	-28.6%	-19.3%	-15.9%
Curr vs Tr	108.2%	38.5%	143.3%	82.6%	77.9%
5yr GR	4.9%	-4.9%	3.4%	1.3%	5.0%
10yr GR	4.9%	0.5%	2.0%	-0.6%	1.5%
Volatility	11.5%	14.1%	30.5%	17.4%	10.5%

Year End	Rent Growth Trend				
	MF	Retail	Hotel	Ofc	Ind
2005	2.89	3.23	-	3.19	-
2006	4.38	3.37	-	8.93	-
2007	4.73	2.39	-	10.54	-
2008	1.95	(1.02)	-	0.24	-
2009	(2.92)	(3.68)	-	(8.86)	-
2010	2.39	(1.43)	-	(1.52)	-
2011	2.43	(0.06)	-	2.04	(0.48)
2012	3.86	0.48	-	1.95	1.91
2013	3.33	1.51	-	2.22	1.64
2014	3.69	1.96	-	3.02	2.76
2015	5.16	2.21	-	3.18	2.02
2016	5.83	2.00	-	3.84	2.42
2017	4.23	1.96	-	1.93	6.44
2018	4.39	2.09	-	2.93	3.67

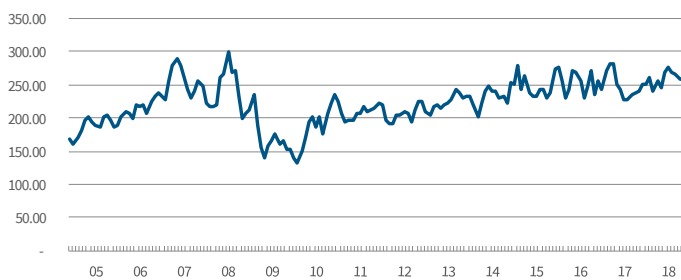
### Multifamily



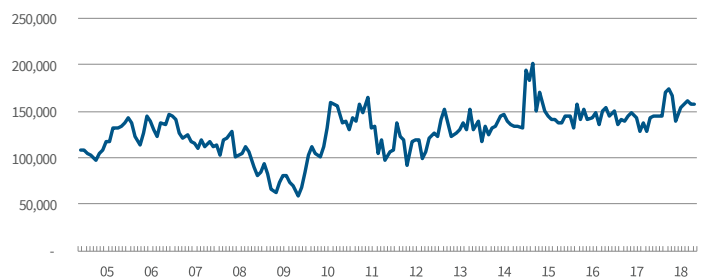
### Retail



### Office



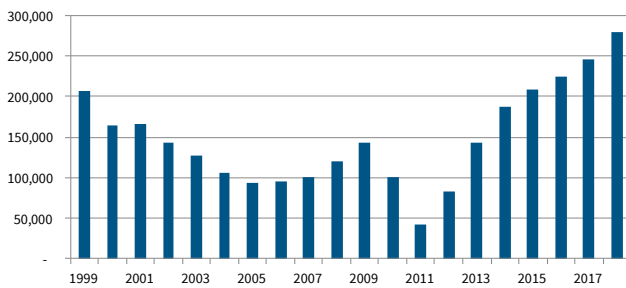
### Hotel



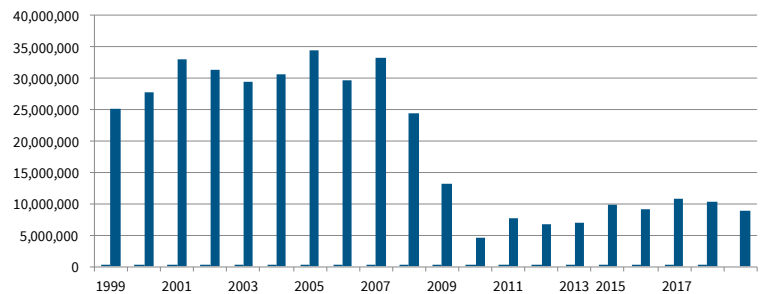
# CRE FUNDAMENTALS – New Construction and Delivery Trends

Year	Deliveries				Net Absorption				Notes
	Multi	Retail	Office	Ind / Whse	Multi	Retail	Office	Ind / Whse	
1999	206,040	25,126,000	120,280,000	-	-	-	-	-	
2000	164,674	27,727,000	111,061,000	-	1.34x	1.42x	(1.02)	-	Multifamily - Record deliveries.
2001	166,124	33,013,000	134,904,000	-	0.12x	0.59x	(0.28)	-	• Growth rate nearly 14% vs 2017
2002	143,957	31,369,000	81,422,000	-	(0.04)	0.87x	(0.15)	-	• Net absorption approx 0.78x, and
2003	127,591	29,416,000	41,016,000	-	0.35x	0.97x	0.99x	-	• less than 1.0x for past 5 years
2004	106,144	30,596,000	35,475,000	-	0.48x	1.06x	1.91x	-	Retail deliveries decline significantly.
2005	93,699	34,438,000	39,792,000	-	0.35x	1.03x	1.43x	-	• Past 4 years at 9-10mm sqft
2006	95,205	29,627,000	49,879,000	-	(0.03)	0.75x	1.08x	-	• Net absorption barely positive
2007	100,630	33,254,000	59,902,000	-	0.99x	0.71x	(0.69)	-	Office - deliveries highest in past 10 years
2008	119,630	24,545,000	65,450,000	-	0.10x	(0.27)	(1.18)	-	• Net absorption <1.0x for 4 years
2009	143,130	13,142,000	50,548,000	-	0.02x	(1.64)	(0.42)	-	• Slow, steady building and rent growth
2010	101,268	4,499,000	23,375,000	10,017,000	2.27x	(0.71)	0.71x	(3.51)	Industrial and Whse near LY record of 32%
2011	42,606	7,625,000	15,440,000	13,388,000	4.03x	0.83x	1.01x	4.83x	• Record high deliveries
2012	82,679	6,778,000	12,443,000	22,585,000	1.67x	1.67x	1.86x	3.82x	• Rents relatively stable
2013	143,227	6,883,000	25,959,000	38,740,000	1.14x	1.84x	1.08x	1.73x	• Net absorption falls below 1.0x
2014	188,125	9,776,000	28,287,000	76,678,000	0.95x	1.36x	1.36x	1.27x	
2015	209,409	9,088,000	36,642,000	78,848,000	0.96x	1.36x	0.79x	1.46x	
2016	223,840	10,815,000	36,659,000	95,459,000	0.96x	1.07x	0.63x	1.42x	
2017	246,140	10,318,000	39,048,000	137,428,000	0.68x	0.68x	0.74x	1.15x	
2018E	279,990	8,874,000	48,295,000	141,194,000	0.78x	0.23x	0.54x	0.76x	

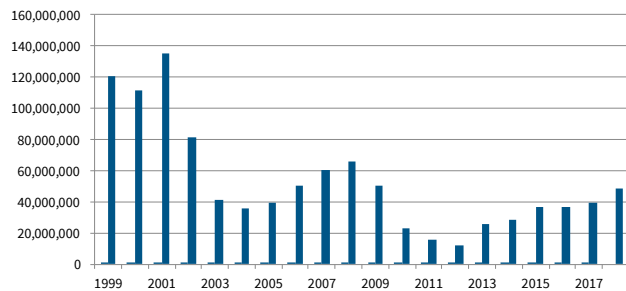
### Multifamily



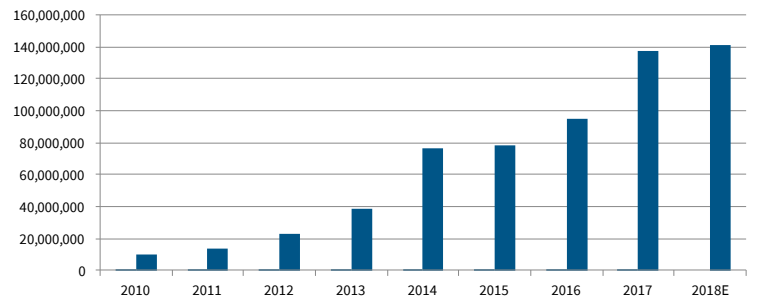
### Retail



### Office



### Industrial/Warehouse



## SECURITIZED MARKETS – 2018 Conduit and SASB Issuance

Type	SERIES	Pricing	AMOUNT	SERVICER	SPSERV	B-PIECE	#PROP	#LOAN	RR Type	RR Yld	
CMBS	Conduit	BMARK 2018-B1	01/19/18	1,166.38	Wells Fargo	Midland	Eightfold	173	49	L	20.00
		BANK 2018-BNK10	01/26/18	1,287.15	Wells Fargo	Torchlight	Torchlight	181	68	VERT	-
		BMARK 2018-B2	02/09/18	1,507.01	KeyBank	CWCAM	MassMutual	67	57	HRZ	13.18
		UBSCM 2018-C8	02/12/18	1,045.17	Midland	Midland	KKR	126	67	HRZ	15.02
		CGCMT 2018-B2	03/08/18	1,062.39	Midland	LNR Partners	LNR / Stream	142	52	VERT	-
		WFCM 2018-C43	03/12/18	722.45	Wells Fargo	Midland	KKR	132	63	L	17.70
		GSMS 2018-GS9	03/15/18	887.13	Wells Fargo	Rialto Capital	Rialto Capital	228	37	L	17.38
		UBSCM 2018-C9	03/23/18	839.91	Midland	Rialto Capital	Rialto Capital	112	43	HRZ	15.01
		BMARK 2018-B3	03/23/18	1,092.54	Midland	Midland	KKR	75	45	HRZ	13.80
		CSAIL 2018-CX11	04/03/18	952.87	Midland	LNR Partners	Silverpeak	118	56	HRZ	14.15
		BANK 2018-BNK11	04/13/18	688.20	Wells Fargo	Midland	Eightfold	76	42	VERT	-
		WFCM 2018-C44	04/30/18	766.69	Wells Fargo	Rialto Capital	Rialto Capital	55	44	HRZ	15.00
		COMM 2018-COR3	05/04/18	1,006.08	Midland	Midland	LoanCore Capital	44	41	HRZ	13.88
		BANK 2018-BNK12	05/15/18	901.17	Wells Fargo	Midland	Ellington	95	63	VERT	-
		UBSCM 2018-C10	05/23/18	730.42	Wells Fargo	Rialto Capital	Rialto Capital	87	57	HRZ	15.13
		JPMDB 2018-C8	05/23/18	713.14	Wells Fargo	LNR Partners	LNR	69	41	L	20.85
		CGCMT 2018-C5	06/07/18	668.24	Midland	KeyBank	Prime Group	45	40	HRZ	14.06
		MSC 2018-H3	06/27/18	1,024.24	Wells Fargo	LNR Partners	Silverpeak	120	66	HRZ	13.59
		UBSCM 2018-C11	06/28/18	803.82	Midland	LNR Partners	Silverpeak	91	48	L	18.54
		BMARK 2018-B4	06/28/18	1,158.48	Wells Fargo	CWCAM	MassMutual	60	44	HRZ	13.15
		WFCM 2018-C45	06/28/18	658.77	Wells Fargo	LNR Partners	Prime Group	89	49	HRZ	14.44
		GSMS 2018-GS10	07/18/18	873.84	Wells Fargo	Rialto Capital	Rialto / DoubleLine	57	33	L	19.65
		BANK 2018-BNK13	07/23/18	944.19	Wells Fargo	Torchlight	Torchlight	80	62	VERT	-
		BMARK 2018-B5	07/27/18	1,039.13	Wells Fargo	Midland	Prime Group	219	55	HRZ	13.53
		CD 2018-CD7	08/02/18	717.44	KeyBank	Rialto Capital	Rialto Capital	72	42	HRZ	14.16
		UBSCM 2018-C12	08/03/18	804.94	Midland	Midland	KKR	75	65	HRZ	14.60
		CSAIL 2018-CX12	08/08/18	715.66	Wells Fargo	LNR Partners	Silverpeak	116	41	HRZ	14.20
		WFCM 2018-C46	08/10/18	692.11	Wells Fargo	LNR Partners	Silverpeak	55	49	HRZ	14.11
		BANK 2018-BNK14	09/18/18	1,379.43	Wells Fargo	Rialto Capital	Rialto Capital	136	62	VERT	-
		BMARK 2018-B6	09/20/18	1,147.03	KeyBank	Midland	KKR	211	55	L	16.75
		UBSCM 2018-C13	09/21/18	714.88	Midland	Midland	KKR	68	53	HRZ	14.17
		KCM 2018-S1	09/27/18	132.33	KeyBank	KeyBank	Sutherland	40	31	VERT	-
		WFCM 2018-C47	10/09/18	951.56	Wells Fargo	Midland	KKR	106	74	HRZ	14.20
		MSC 2018-L1	10/12/18	900.60	Midland	Midland	KKR	74	47	L	16.95
		DBGS 2018-C1	10/17/18	1,100.68	Wells Fargo	Rialto Capital	Rialto Capital	102	37	L	19.76
		BANK 2018-BNK15	11/16/18	1,084.92	Wells Fargo	Midland	Eightfold	126	67	VERT	-
		BMARK 2018-B7	11/09/18	1,167.92	KeyBank	LNR Partners	Eightfold	227	51	L	19.25
		CSAIL 2018-C14	11/20/18	770.23	Wells Fargo	Rialto Capital	Rialto Capital	65	44	VERT	-
		CGCMT 2018-C6	11/19/18	736.40	Wells Fargo	Midland	KKR	58	35	HRZ	14.90
		UBSCM 2018-C14	11/28/18	650.89	Midland	Rialto Capital	Rialto Capital	236	45	VERT	-
BBCMS 2018-C2	12/04/18	891.85	Wells Fargo	LNR Partners	LNR	87	44	L	20.52		
WFCM 2018-C48	12/07/18	833.93	Wells Fargo	LNR Partners	Silverpeak	95	52	HRZ	14.05		
BMARK 2018-B8	12/10/18	1,049.02	Midland	CWCAM	MassMutual	200	41	HRZ	13.10		
MSC 2018-H4	12/14/18	796.81	Midland	LNR Partners	Silverpeak	115	51	HRZ	13.70		
UBSCM 2018-C15	12/18/18	646.48	Midland	Midland	KKR	317	41	HRZ	14.50		
			<b>40,424.47</b>								

Type	SERIES	Pricing	AMOUNT	SELLER	SPSERV	Risk Retention	Asset	RR Type	RR Yld		
CMBS	SASB	Various	Q1 2018	9,420.05	Various	Various	Various				
		Various	Q2 2018	10,260.50	Various	Various	Various				
		Various	Q3 2018	11,928.37	Various	Various	Various				
		BAMLL 2018-DSNY	11/01/18	447.00	Tishman, MetLife	Wells Fargo	BOA	Disney Swan & Dolphin	VERT	-	
		GSMS 2018-LUUAU	11/08/18	215.00	Blackstone	LNR Partners	Oaktree Capital	Ritz Carlton Kapalua	HRZ	L+696	
		GSMS 2018-FBLU	11/20/18	850.00	Turnberry Associates	KeyBank	Canada Pension Plan	Fountainbleu Miami	HRZ	L+395	
		JPMCC 2018-MINN	11/26/18	180.00	Walton Street Capital	Trimont	DoubleLine Capital	Hilton Minneapolis	HRZ	L+900	
		CSMC 2018-SITE	12/12/18	314.32	SITE Ctrs, China Life	Midland	Blackrock	10 Mall / ShopCtrs - Site	HRZ	7.80%	
		DBWF 2018-GLKS	12/17/18	597.00	Elliott / Trinity RE	LNR Partners	LNR Partners	JW Marriott & Ritz Orlando	HRZ	L+475	
					<b>34,212.24</b>						

Subordinate Buyer	Conduit	SASB	Total	Special Servicers	Conduit	SASB	Total	Type	Balance	Deals
KKR	8,762.04	-	8,762.04	Midland	14,647.92	964.32	15,612.24			
Rialto Capital	7,842.82	-	7,842.82	LNR Partners	10,313.49	2,399.00	12,712.49			
Silverpeak	5,819.43	-	5,819.43	Aegon	-	10,158.08	10,158.08	VERT	8,900.88	10
Eightfold	4,107.41	-	4,107.41	Keybank	800.56	8,978.90	9,779.46	HRZ	21,148.76	24
MassMutual	3,714.51	-	3,714.51	Rialto Capital	8,716.65	375.00	9,091.65	L	10,374.83	11
Prime Group	2,366.14	-	2,366.14	CWCAM	3,714.51	2,627.00	6,341.51		<b>40,424.47</b>	<b>45</b>
Torchlight	2,231.34	-	2,231.34	Wells Fargo	-	6,257.58	6,257.58			
LNR	1,604.99	-	1,604.99	Torchlight	2,231.34	400.00	2,631.34			
LNR / Stream	1,062.39	-	1,062.39	Trimont	-	1,374.50	1,374.50			
LoanCore Capital	1,006.08	-	1,006.08	Situs	-	362.57	362.57	VERT	16,525.51	36
Ellington	901.17	-	901.17	Cohen Financial	-	315.30	315.30	HRZ	17,686.73	36
Rialto / DoubleLine	873.84	-	873.84		-	-	-	L	-	-
Sutherland	132.33	-	132.33		-	-	-			
RR Holders>	-	34,212.24	34,212.24						<b>34,212.24</b>	<b>72</b>
<b>Total</b>	<b>40,424.47</b>	<b>34,212.24</b>	<b>74,636.71</b>		<b>40,424.47</b>	<b>34,212.24</b>	<b>74,636.71</b>		<b>74,636.71</b>	



## SECURITIZED MARKETS – 2018 FHLMC Issuance

Type	SERIES	Pricing	AMOUNT	SERVICER	SPSERV	B-PIECE	#PROP	#LOAN	
<b>FREMF</b>	<b>7-Year</b>	FREMF 2018-K730	02/28/18	1,470.54	Midland	KeyBank	Connor Group	52	52
		FREMF 2018-K731	04/05/18	1,248.73	Wells Fargo	KeyBank	Berkshire Group	58	54
		FREMF 2018-K732	06/20/18	1,082.43	Midland	CWCAM	Torchlight	49	49
		FREMF 2018-K733	11/01/18	1,003.35	Midland	CWCAM	Blackstone	47	44
<b>10-Year</b>		First Half 2018	Various	7,723.59	Various	Various	Various	389	388
		FREMF 2018-K78	07/10/18	1,310.43	Wells Fargo	CWCAM	Kayne Anderson	48	48
		FREMF 2018-K79	08/08/18	1,179.06	KeyBank	Wells Fargo	Berkshire Group	60	60
		FREMF 2018-K80	09/12/18	1,319.12	Midland	KeyBank	NexPoint Advisors	67	67
		FREMF 2018-K81	10/03/18	1,282.66	Wells Fargo	Wells Fargo	Bridge	62	62
		FREMF 2018-K82	10/24/18	1,338.57	KeyBank	KeyBank	RREEF America	62	62
		FREMF 2018-K83	10/31/18	1,352.08	KeyBank	Midland	Related Cos.	58	58
		FREMF 2018-K84	11/15/18	1,486.78	Wells Fargo	Wells Fargo	New York Mtg	71	71
		FREMF 2018-K85	11/28/18	1,558.45	Midland	KeyBank	Berkshire Group	59	59
		FREMF 2018-K86	12/19/18	1,090.65	KeyBank	Midland	Related Cos.	54	54
<b>15-Year</b>		FREMF 2018-K1504	01/11/18	881.68	KeyBank	KeyBank	Priderock Capital	59	59
		FREMF 2018-K1505	06/07/18	904.93	KeyBank	Midland	Related Cos.	51	51
		FREMF 2018-K1506	08/14/18	699.54	KeyBank	CWCAM	Angelo Gordon, McDowell	34	34
		FREMF 2018-K1507	09/21/18	805.98	Wells Fargo	Wells Fargo	New York Mtg	40	40
		FREMF 2018-K1508	11/09/18	782.07	KeyBank	KeyBank	Priderock Capital	46	46
		FREMF 2018-K1509	12/12/18	617.13	Midland Loan Services	CWCAM	Angelo Gordon, McDowell	28	28
<b>Floater</b>		First Half 2018	Various	7,588.45	Various	Various	Various	356	345
		FREMF 2018-KF48	07/18/18	1,315.70	Wells Fargo	CWCAM	Kayne Anderson	62	43
		FREMF 2018-KF49	08/08/18	1,239.89	Wells Fargo	Wells Fargo	Greystar	55	55
		FREMF 2018-KF50	09/06/18	1,189.80	Wells Fargo	KeyBank	Harbor	49	49
		FREMF 2018-KF51	09/20/18	991.80	KeyBank	CWCAM	Blackstone	42	42
		FREMF 2018-KF52	10/16/18	951.01	Wells Fargo	CWCAM	Kayne Anderson	55	36
		FREMF 2018-KF53	10/31/18	1,197.88	Midland Loan Services	Wells Fargo	Bridge	49	49
		FREMF 2018-KF54	12/06/18	908.97	KeyBank	KeyBank	Harbor	41	41
		FREMF 2018-KF55	12/13/18	882.46	Wells Fargo	CWCAM	Berkshire Group	40	40
		FREMF 2018-KF56	12/18/18	704.99	Wells Fargo	Wells Fargo	Bridge	21	21
<b>Jr Lien</b>		FREMF 2017-KJ19	03/15/18	290.98	Freddie Mac	Wells Fargo	Waterton	60	60
		FREMF 2018-KJ20	08/01/18	314.79	Freddie Mac	Midland	Related Cos.	58	58
		FREMF 2018-KJ21	09/07/18	310.81	Freddie Mac	KeyBank	Harbor	69	76
		FREMF 2018-KJ22	11/08/18	446.94	Freddie Mac	CWCAM	Kayne Anderson	84	86
		FREMF 2018-KJ23	12/07/18	202.40	Freddie Mac	Wells Fargo	Berkshire Group	31	31
<b>Small Bal</b>		First Half 2018	Various	3,081.78	Various	Various	Various	1157	1157
		FRESB 2018-SB51	07/12/18	507.85	Freddie Mac	KeyBank	Axonic Capital	197	197
		FRESB 2018-SB52	08/17/18	561.58	Freddie Mac	KeyBank	Waterfall, Sabal	217	217
		FRESB 2018-SB53	09/12/18	589.29	Freddie Mac	KeyBank	Tilden Park	226	226
		FRESB 2018-SB54	10/12/18	537.66	Freddie Mac	Arbor	Axonic, Arbor	182	182
		FRESB 2018-SB55	11/14/18	606.82	Freddie Mac	KeyBank	Axonic Capital	222	222
		FRESB 2018-SB56	12/07/18	563.70	Freddie Mac	Sabal Financial	Sabal Financial	226	226
		FRESB 2018-SB57	12/13/18	576.32	Freddie Mac	KeyBank	Axonic Capital	224	224
		FRESB 2019-SB58	01/10/19	622.47	Freddie Mac	KeyBank	Tilden Park	238	238
	<b>Wkforce</b>		FREMF 2018-KW04	03/23/18	631.50	Midland	KeyBank	NexPoint Advisors	44
		FREMF 2018-KW05	06/05/18	637.67	Midland	Wells Fargo	Bridge	51	38
		FREMF 2018-KW06	08/01/18	666.04	Midland	Wells Fargo	Morgan Prop	45	45
		FREMF 2018-KW07	11/13/18	682.70	Wells Fargo	Wells Fargo	Morgan Prop	36	36
<b>SASB</b>		FREMF 2018-KI01	01/31/18	591.31	Freddie Mac	Wells Fargo	Bridge	21	21
		FREMF 2018-KHG1	02/07/18	789.58	Midland	Wells Fargo	Bridge	11	1
		FREMF 2018-KBX1	03/23/18	741.34	Wells Fargo	Midland	Blackstone	13	13
		FREMF 2018-KI03	10/23/18	513.09	Freddie Mac	Wells Fargo	Bridge	12	12
		FREMF 2018-KSW4	11/14/18	689.72	Wells Fargo	CWCAM	Greystar	23	23
		FREMF 2018-KBF2	11/28/18	750.00	Wells Fargo	Wells Fargo	Bridge	24	24
		FREMF 2018-KSL1	12/19/18	800.45	Midland	Wells Fargo	Bridge	23	1
<b>Large</b>		FREMF 2018-KL02	03/06/18	1,317.92	Wells Fargo	Wells Fargo	Bridge	37	10
		FREMF 2018-KL03	10/15/18	717.80	Midland	Wells Fargo	Bridge / Pimco	9	2
		FREMF 2019-KL04	01/17/19	702.38	Wells Fargo	Keybank	Bridge / Pimco	22	22
<b>Seasoned</b>		FREMF 2018-KP05	12/07/18	684.97	Freddie Mac	Freddie Mac	None	54	60
<b>Senior</b>		FREMF 2018-KS10	12/13/18	1,316.91	Wells Fargo	CWCAM	Kayne Anderson	75	10
<b>Kick-out</b>		FREMF 2018-KX03	05/17/18	876.89	Freddie Mac	Midland	Bridge, Pimco, Harbor	81	83
<b>Prepay</b>		FREMF 2018-KC02	09/20/18	1,014.41	Midland	KeyBank	NexPoint Advisors	37	37

77 69,446.78

## SECURITIZED MARKETS – 2018 FHLMC Issuance (cont.)

Subordinate Buyer	Deals	Deal Balance
Bridge	12	11,160.87
Kayne Anderson	7	7,870.92
Berkshire Group	6	6,398.07
Related Cos.	6	6,274.10
Blackstone	4	3,957.05
Harbor	4	3,513.35
NexPoint Advisors	3	2,965.02
Priderock Capital	3	2,883.40
Axonic Capital	5	2,690.31
Morgan Prop	3	2,638.76
New York Mtg	2	2,292.76
Greystar	2	1,929.61
Connor Group	1	1,470.54
Cyrus Capital	1	1,434.17
Bridge / Pimco	2	1,420.18
RREEF America	1	1,338.57
Angelo Gordon, McDowell	2	1,316.67
Tilden Park	2	1,211.76
Sabal Financial	2	1,116.30
Torchlight	1	1,082.43
Bridge, Pimco, Harbor	1	876.89
None	1	684.97
Axonic, Arbor, Sabal	1	568.26
Waterfall, Sabal	1	561.58
Garrison	1	559.36
Axonic, Arbor	1	537.66
Waterfall, Axonic, Arbor	1	402.24
Waterton	1	290.98
<b>77</b>	<b>69,446.78</b>	

Spec Svc	Deals	Deal Balance
Wells Fargo	23	21,049.49
KeyBank	22	19,649.95
CWCAM	15	15,057.90
Midland	9	9,326.51
Sabal Financial	2	1,116.30
Arbor	3	1,508.15
Freddie Mac	1	684.97
LNR Partners	2	1,053.51
<b>77</b>	<b>69,446.78</b>	

## SECURITIZED MARKETS – 2017/2018 CLO Issuance

Year	ISSUER	SERIES	DATE	AMOUNT	SELLER	SERVICER	COLMGR
2017	PFP Ltd.	2017-3	03/06/17	567.40	Prime Finance	Wells Fargo	Prime Finance
2017	Arbor Realty Commercial Ltd.	2017-FL1	03/28/17	360.00	Arbor Realty	Arbor Realty	Arbor Realty
2017	BSPRT Ltd.	2017-FL1	06/12/17	418.06	Benefit Street	Situs	Benefit Street
2017	RAIT Trust	2017-FL7	06/13/17	342.37	RAIT Financial	RAIT Financial	RAIT Financial
2017	Resource Capital Corp.	2017-CRE5	06/26/17	376.70	Resource Capital	C-III	Resource Capital
2017	Hunt CRE Ltd.	2017-FL1	08/01/17	349.23	Hunt Mortgage	KeyBank	Hunt Mortgage
2017	Ready Capital Mortgage Financing LLC	2017-FL1	08/02/17	243.80	ReadyCap	KeyBank	ReadyCap
2017	Arbor Realty Commercial Ltd.	2017-FL2	08/07/17	365.00	Arbor Realty	Arbor Realty	Arbor Realty
2017	A10 Term Asset Financing LLC	2017-1	08/08/17	350.97	A10 Capital	A10 Capital	A10 Capital
2017	Bancorp Commercial Mortgage Trust	2017-CRE2	08/11/17	314.36	Bancorp Bank	Wells Fargo	Bancorp Bank
2017	PFP Ltd.	2017-4	09/18/17	652.15	Prime Finance	Wells Fargo	Prime Finance
2017	LCCM CRE Trust	2017-FL1	10/03/17	456.85	Ladder Capital	Wells Fargo	Ladder Capital
2017	BSPRT Ltd.	2017-FL2	11/15/17	440.69	Benefit Street	Situs	Benefit Street
2017	RAIT Trust	2017-FL8	11/17/17	259.78	RAIT Financial	RAIT Financial	RAIT Financial
2017	Arbor Realty Commercial Ltd.	2017-FL3	12/06/17	480.00	Arbor Realty	Arbor Realty	Arbor Realty
2017	BXMT Ltd.	2017-FL1	12/08/17	1,000.00	Blackstone	Midland	Blackstone
<b>2017 - Year to Date</b>				<b>6,977.36</b>			

Year	ISSUER	SERIES	DATE	AMOUNT	SELLER	SERVICER	COLMGR
2018	VMC Finance LLC	2018-FL1	01/26/18	368.09	Varde Partners	Trimont	Varde Partners
2018	TPG Real Estate Finance	2018-FL1	02/05/18	932.38	TPG	Wells Fargo	TPG
2018	Bridge Debt Strategies	2018-FL1	02/13/18	510.23	Bridge	Wells Fargo	Bridge
2018	AREIT Trust	2018-CRE1	02/14/18	480.38	Silverpeak	Wells Fargo	Silverpeak
2018	Bancorp Commercial Mortgage Trust	2018-CRE3	03/13/18	304.27	Bancorp Bank	Wells Fargo	Bancorp Bank
2018	BSPRT Ltd.	2018-FL3	03/23/18	610.00	Benefit Street	Situs	Benefit Street
2018	GPMT Ltd.	2018-FL1	04/26/18	826.57	Granite Point	Wells Fargo	Granite Point Mtg
2018	LoanCore Ltd.	2018-CRE1	05/18/18	1,052.91	LoanCore Capital	Situs	LoanCore Capital
2018	Arbor Realty Commercial Ltd.	2018-FL1	05/23/18	560.00	Arbor Realty	Arbor	Arbor Realty
2018	Exantas Capital Corp.	2018-RSO6	06/07/18	514.23	RCC Real Estate	C-III	Exantas Capital
2018	Ready Capital Mortgage Financing LLC	2018-FL2	06/15/18	278.28	ReadyCap	KeyBank	ReadyCap
2018	Marathon CRE Ltd	2018-FL1	06/22/18	470.00	Marathon Asset Mgt	KeyBank	Marathon Asset Mgt
2018	M360 Ltd.	2018-CRE1	07/18/18	329.74	M360 Advisors	Wells Fargo	M360 Advisors
2018	Shelter Growth CRE Ltd.	2018-FL1	07/20/18	415.13	Shelter Growth Cap	Wells Fargo	Shelter Growth
2018	BDS Ltd.	2018-FL2	07/25/18	420.02	Bridge Investment	Wells Fargo	Bridge Investment
2018	Hunt CRE Ltd.	2018-FL2	08/03/18	285.00	Hunt Mortgage	KeyBank	Hunt Mortgage
2018	Greystone Commercial Ltd	2018-HC1	09/11/18	300.00	Greystone	Greystone	Greystone
2018	Bancorp Commercial Mortgage Trust	2018-CRE4	09/17/18	341.00	Bancorp Bank	Wells Fargo	Bancorp Bank
2018	BSPRT Ltd.	2018-FL4	09/27/18	868.40	Benefit Street	Situs	Benefit Street
2018	VMC Finance LLC	2018-FL2	10/19/18	462.30	VMC Lender	Trimont	Varde Partners
2018	AREIT Trust	2018-CRE2	10/30/18	596.31	Silverpeak	Wells Fargo	Silverpeak
2018	KREF Ltd.	2018-FL1	11/07/18	1,000.00	KKR	Midland	KKR
2018	TRTX Ltd.	2018-FL2	11/15/18	1,000.17	TPG Real Estate	Situs	TPG Real Estate
2018	OREC Ltd.	2018-CRE1	11/20/18	350.00	ORIX	RED Mtg Capital	ORIX
2018	FORT CRE LLC	2018-1	11/28/18	600.00	Fortress	Wells Fargo	Fortress
<b>2018 - Year to Date</b>				<b>13,875.40</b>			

## SOURCES

The third-party Information set forth herein is derived from the following sources:

- Bloomberg
- CBRE Capital Markets
- Citibank Research
- Commercial Mortgage Alert
- CRE Direct
- FHLMC
- Intex Solutions
- Maximus Ten-X
- Morningstar Research
- Moody's / RCA CPPI
- National Center for Education Statistics
- National Real Estate Investor
- Real Capital Analytics
- REIS
- Trepp Information Systems
- US Bureau of Labor Statistics
- US Census Bureau
- US Federal Reserve
- US Treasury
- Wells Fargo Research

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