

# Freddie K CMBS Guide<sup>1</sup>

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*This Freddie Mac CMBS Guide introduces the Agency's multi-family lending program and related K bonds and discusses how their guarantee and collateral performance should be considered in a relative value framework.*

<sup>1</sup>This report updates our previous Freddie K CMBS Guide, published on November 1<sup>st</sup>, 2018.

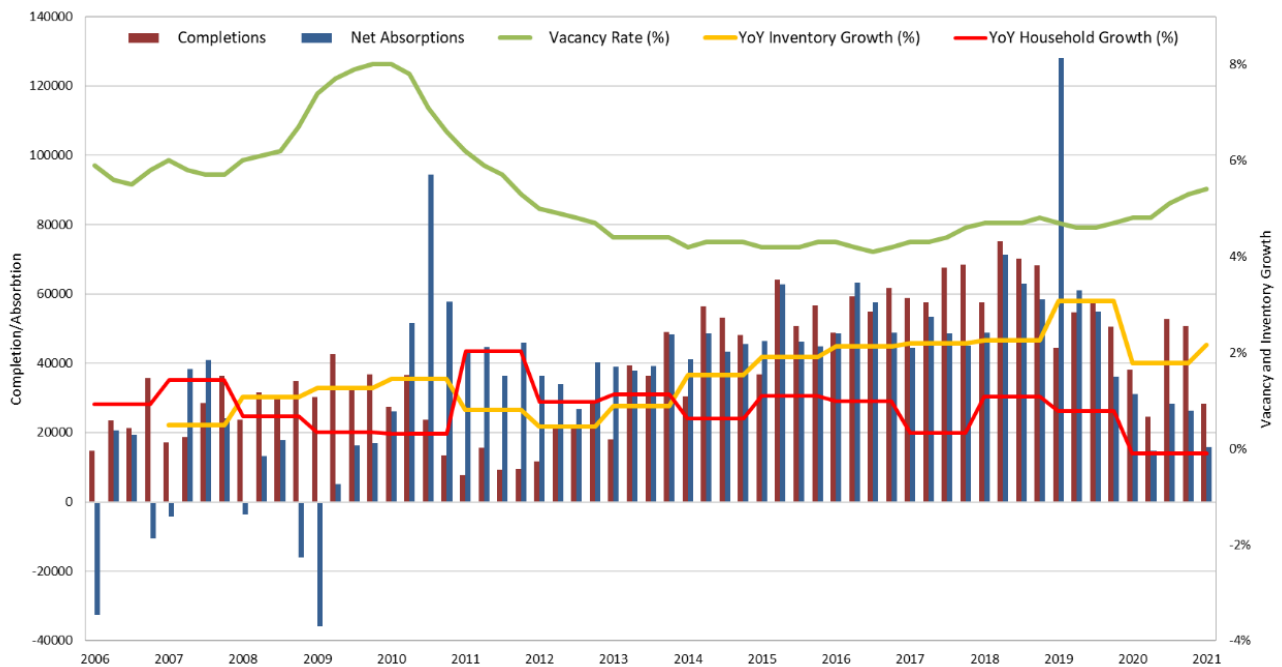
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## 1. Multifamily Fundamentals - Limited Supply and Steady Demand Create Affordability Issues

Since the Great Financial Crisis, the U.S. has shown steady household formation which real estate developers have tried to meet with housing supply. Exhibit 1 shows multifamily rental completions (as a red bar) relative to absorption (the blue bar) with the net result being the national vacancy rate (the green line). The other lines show annual growth rates demonstrating how inventory growth (the yellow line) has tried to meet the national household growth rate (the red line). **At the beginning of the time sequence, multifamily growth roughly matched household growth, but as home prices appreciated a greater proportion of households have had to turn to rental housing as the more affordable housing option.** This transition takes place after mid-2016 when the multifamily growth rate becomes almost double the household formation line, yet the vacancy rate remains relatively stable. **The recent impact of COVID-19 can be seen on far right of the graph as household formation is near zero and inventory growth remained near 2%, which helped increase the national vacancy rate.**

**Exhibit 1. U.S. Multi-Family Unit Supply, Absorption, Vacancy and Household Formation**



Source: Costar Data and Census Bureau Data

**COVID-19 held back multifamily housing demand, but demand will quickly be restored.**

Much of the household formation in Exhibit 1 is due to new immigration, while an aging population that is downsizing into rental units supports an ongoing increase in multifamily rental unit demand. **But COVID-19 paused both of those factors as many new or young households opted to move into single family housing sooner and older Americans put off downsizing their housing requirements.** As more people become vaccinated and regions emerge from

COVID-19 lockdowns, we expect that those trends will reverse. To size the potential effect on the multifamily market we use employment to gross rent coefficients for the major markets and projected how those markets may recover if 70%, 85%, or 105% of employment is restored over the next year<sup>2</sup>. The results of that analysis are presented in Exhibit 2.

## Exhibit 2. Employment To Multi-Family Gross Rent -- Rents Will Quickly Start to Grow Again.

MSA	Unemployment		Non-Farm Payroll					Gross Rev. (Occ.*Eff Rnt)		Projections (Current & Based on Employment Restored)										Regression Metrics		
										Mark to Employment Projection		Recovery Projections										

Source: REIS, Bloomberg, and Cantor Fitzgerald as of June 4<sup>th</sup>, 2021

The city projections suggest multifamily rents in some markets may still drop even as pre-COVID employment returns, as those markets had experienced recent rental inflation beyond what was justified by their historical coefficients.

**These “hot” but potentially future under-performing markets include Chicago, Detroit, Oakland, and Philadelphia, all of which had some of the lower pre-COVID vacancy rates.** But even anticipating slower recoveries in those markets our overall base case recovery has rental rates down only 3.95% on average. We should also state that is also possible that markets that were overheated before the pandemic may quickly recover again. **Our overall multifamily analysis suggests revenues should recover quickly and benefit Agency CMBS credit performance, which will also quickly strain rental affordability.**

**During COVID-19 Freddie Mac continued to originate mortgages and issue various K bonds.**

Both Freddie Mac and Fannie Mae continued to underwrite and issue guaranteed multifamily bonds during the pandemic. **This continuity was only possible due to strong multifamily fundamentals and the GSE’s bond guarantee, as other markets such as private label CMBS conduit have struggled with a post-COVID recovery.** For multifamily landlords the stable financing market allowed them to refinance into low-cost loans, minimizing their costs while allowing

<sup>2</sup> Investors interested in the full NFP employment to gross revenue methodology should review: “Volatile Employment Recovery, But CRE Fundamentals Are Still Moving In a Good Direction, May 20, 2021, Darrell Wheeler and William Babcock.

landlords to focus on rental collections. ***Borrowers that had tenants who were unable to pay due to COVID-19 were proactively offered forbearance which has avoided unnecessary distress and should help these properties quickly stabilize as resources were not lost in legal disputes.*** This easy access to a forbearance program has now been extended through the end of September. Later we will show how this has been used by the various Freddie Mac borrowers, and how we expect forbearance will decrease as federal rent relief funds are distributed by each state and applied to back rent and current rental obligations.

Public and private enterprises have undertaken extraordinary steps to try and increase the housing supply, and yet the annual housing supply grew by only 1.53% per year on average in Exhibit 1. The multifamily housing supply is affected by a variety of social/economic/political factors that combine to restrict supply. ***As a result, low financing costs will not by themselves cure the shortage of zoned multifamily sites, the limitations of metropolitan transportation, or reduce increasing construction costs.*** And yet, having the FHA, Fannie Mae, and Freddie Mac offer efficient low-cost multifamily mortgages can limit the resources lost to financing as we will describe in this paper.

Investors participating in these programs also gain many benefits. ***Primarily there is the collateral cash flow stability that limits the overall loan defaults or the need for the GSE guarantee. But in many instances Fannie or Freddie include features to facilitate social benefits and housing affordability assistance within their lending programs, which also provides ESG related benefits to investors.*** But primarily investors are attracted to the cash flow stability and guarantee, which during the COVID-19 crisis has allowed them to issue new bonds and facilitated stable trading markets.

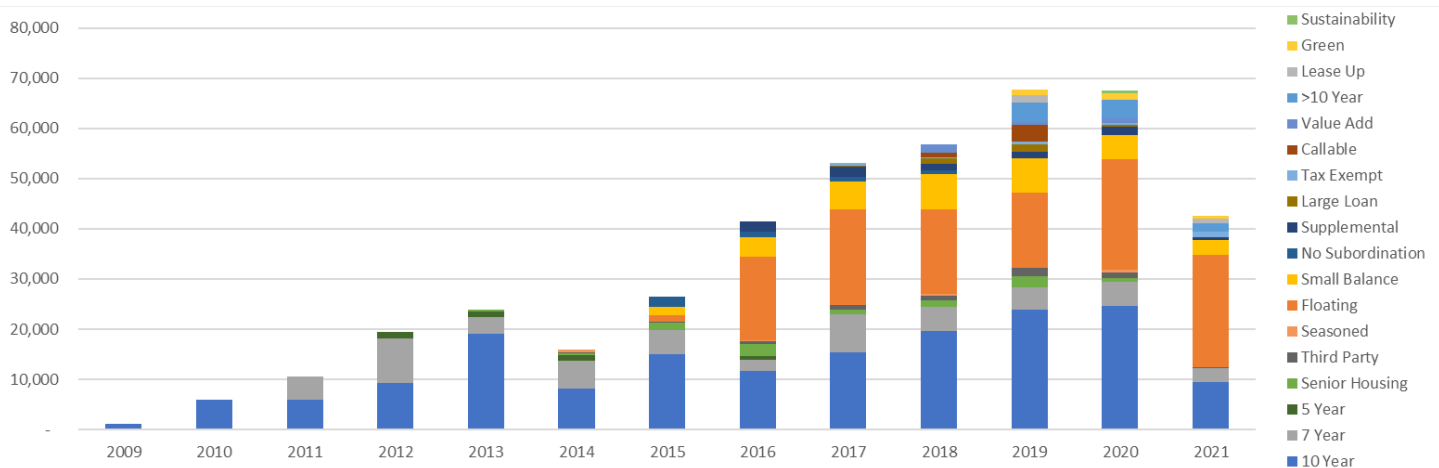


## 2. Freddie Mac Multifamily Lending / CMBS Efforts

**Freddie Mac buys loans from its approved network of 20 Optigo® seller/servicers.**

To maintain a vibrant economy the government wants to see affordable housing in all regions of the country. Freddie Mac's K program directly supports affordable housing efforts by originating low-cost mortgages from its network of pre-approved Optigo® Loan Sellers. Initially, Freddie focused on stabilized multifamily loans but in recent years has expanded its efforts to targeted affordable housing (TAH), small balance loans (SB, 5-50 units or \$1-\$7.5 million in loan size), senior housing (K-S), student housing, workforce (K-W), green bonds (K-G), and sustainable bonds (K-SG). Exhibit 3 uses historical issuance to show how Freddie Mac has moved from fixed-rate stabilized properties (the blue and grey bars) to diversify into these other segments.

**Exhibit 3. Freddie Mac K CMBS Issuance (\$ Millions)**



Source: Bloomberg as of July 26<sup>th</sup>, 2021

**Bond issuance consists of senior guaranteed bonds or junior credit bonds that are priced at market clearing levels.**

Freddie Mac underwrites and approves each mortgage using their own internal underwriting team with funding coming from a hybrid CMBS-like bond structure that issues senior guaranteed bonds and sells the credit risk in subordinate credit tranches. **Utilizing their guarantee on senior bonds lowers the cost of those funds, while the sale of credit classes ensures the mortgages are underwritten and priced at market clearing levels.** The resulting bond issuance is supported by the Agency guarantee, but value is also contributed from Freddie's credit underwriting and origination process that ensures the loans have stable multifamily cash flows along with prepayment protection to provide timing certainty. This paper primarily focuses on Freddie Mac's fixed-rate K bond issuance but will touch on other Freddie issuance products including the growing floating-rate K-F program and their small balance loan program, "FRESB". In Exhibit 4 we provide a full listing of the securitization designations that are used for the various bond types provided by Freddie Mac. As the paper discusses the underlying loans and their performance, we will highlight key features investors should evaluate when considering these bonds.

**Exhibit 4. FREMF Series Collateral Type with Outstanding Balance**

Deal Type	Descriptor	Number of Deals	UPB (\$B)	Description
10-Year	K-000	129	169.7	10 year fixed rate
Floating Rate	K-F00	117	116.4	Various terms of floating rate
7-Year	K-700	41	52.3	7 Year fixed rate
> 10 Year	K-1500	19	15.1	Fixed rate with terms greater than 10 years
5-Year	K-500	4	4.1	5 year fixed rate
Small Balance	SB-00	84	31.0	Small Balance (FRESB)
Supplemental	K-J00	33	9.6	Supplemental loans
Single Sponsor	K-ABC	29	27.6	Single sponsor loans
Senior Housing	K-S00	15	10.6	Backed by senior housing facilities
Third Party	Q-000	14	5.4	3rd party banks and insurance companies collateral
Workforce	K-W00	10	6.1	Workforce housing loans
Tax Exempt	ML-00	9	2.6	Tax-exempt loans
Callable	K-C00	7	5.1	Non-standard prepay terms
Large Loan	K-L00	6	4.7	Large loans
Value-add	K-I00	6	3.2	Value-add loans
No-Subordination	K-P00	5	4.3	Portfolio loans with no subordinate piece
Green	K-G00	5	2.9	Green Advantage loans
Seasoned	K-X00	4	2.5	Seasoned loans
Risk Transfer	K-T00	3	1.7	Multifamily Aggregation Risk Transfer
Lease-up	K-LU0	2	1.5	Lease-up loans
Sustainable	K-SG00	1	0.6	Sustainability focused 10-year fixed rate

Source: Freddie Mac, Bloomberg

**Freddie multifamily financing continues to expand into sustainable and social bonds.**

**The number of programs in Exhibit 4 demonstrates how Freddie has used their hybrid CMBS bond structure to fund some unique multifamily loan projects (K-G or K-SG) that may not have otherwise received funding.** In addition to these K designated bonds Freddie also issues certain PCs, M-Deals and Q-Deals that comply with a social bond framework approved by Sustainalytics<sup>3</sup> to ensure the bonds have a positive impact on society. These social bonds will typically fund community financing institutions, housing financing agencies, or small financial institutions in underserved markets, leading to transitional housing, extremely low-income housing, and housing for tenant groups which may have difficulty obtaining housing otherwise. **These new tenant and community focused social bonds, along with Freddie Mac's K-G and K-SG, provide an expanding selection of ESG impact investments for the market.**

<sup>3</sup> Independent program is provided by Sustainalytics using a framework that recognizes underserved multifamily housing sectors, and Freddie Mac's unique ability to originate these loans as well as manage the loan portfolio and its reporting. An initial description of the Second-Party Opinion can be found under "Freddie Mac Multifamily Social Bonds Framework" at: <https://mf.freddiemac.com/docs/social-bonds-framework-second-opinion-sustainalytics.pdf>

**FHFA Caps have focused the GSE on Affordable housing.**

In recent years, the FHFA has played a more assertive role in guiding Freddie Mac's and Fannie Mae's origination by periodically setting issuance caps and mission driven requirements. **Currently for 2021 Freddie Mac and Fannie Mae are each limited to purchase \$70 billion in multifamily loans.** This is down from a \$100 billion cap that had applied for the previous five quarters from October 2019 to December 2020. **This recent FHFA cap further refined mission-driven requirements so 50% of each GSE's multifamily loans are affordable to residents at 80% of average median income (AMI) and 20% of origination are affordable to residents at 60% AMI.** Given the rental inflation of recent years this last 20% stipulation at 60% of AMI will likely prove to be challenging for each GSE<sup>4</sup>, whereas the expanded 50% affordable mission requirement continues to push each GSE into a wider range of loan types as "mission driven" origination now includes:

- The traditional 80% AMI affordability test
- Properties subsidized by the Low Income Housing Tax Credits (LIHTC)
- Section 8 housing, or loans to a public housing authority
- Assisted senior housing loans where 80% of AMI units are counted
- Rural loans that meet a 100% of AMI requirement

**The program variety justifies multiple guides:**

In meeting these affordable mission goals, Freddie Mac has expanded its origination program to a wide range of multifamily loans that benefit borrowers, disadvantaged tenants, society, or the economy. To help understand many of these programs we have published the following Freddie Mac guides:

1. FRESB GUIDE Freddie Mac Multifamily Small Balance Loan Securitization, March 27<sup>th</sup>, 2019.
2. Individual Guaranteed Loans: Freddie Mac Multi PC—Individual GSE Guaranteed Multifamily Pass-Through Securities That Allow Investors To Target a Portfolio, March 5, 2020.
3. Floating-Rate Loans: Freddie Mac KF CMBS, November 30, 2018
4. Green Bonds: GUIDE – AGENCY CMBS GREEN BONDS Guaranteed Bonds Significantly Improving Multifamily Energy/Water Use, August 29, 2019.
5. Seasoned Bank Pool Loans: Freddie Mac Q-Deals – How Seasoned Multifamily Loans Can Become Guaranteed Bond CUSIPs, December 3, 2019.

The individual guides discuss detailed aspects of each Freddie Mac Multifamily bond program, but also consider the prepayment and default risks investors should review as they consider the related bonds.

Investors interested in how Freddie multifamily bond issuance compares to other Agency CMBS can review Appendix A, which provides a summary of all three government multi-family loan programs along with private CMBS.

<sup>4</sup> Appendix A from this year's FHA release provides details on both the 20% limitation and lists the various types and levels of AMI that applies for rural housing, senior housing and publicly assisted housing. Appendix A can be found on the FHFA website at: <https://www.fhfa.gov/Media/PublicAffairs/PublicAffairsDocuments/2021-Appendix-A.pdf>



### 3. Freddie Mac K Loans - From Origination To Bond Certificates

Freddie Mac uses 20 approved Optigo® lenders to originate and service loans, **but Freddie Mac takes responsibility for the loan underwriting required to approve each loan.** This underwriting and approval process is facilitated by more than 1,000 Freddie Mac employees located in four regional and nine field offices. Having a geographic branch network ensures that Freddie Mac's underwriters have sufficient local market expertise to evaluate mortgage locations and financials. The Optigo® originator/sellers are initially reviewed for product origination expertise, minimum net asset levels, and are subject to an annual audit from Freddie Mac. Freddie Mac also requires that authorized loan sellers for senior and affordable housing meet additional experience requirements.

Optigo® originators submit proposed loan underwritings based upon Freddie Mac's underwriting guidelines and pre-size potential loans with an expected LTV and DSCR. Freddie Mac will re-underwrite loans using trailing 3-month actual rent collections or annualized current rent roll minus a minimum 5% vacancy allowance subject to local market adjustments. Similarly, they apply expenses and capital cost allocations with the intention that each loan's cash flow has been conservatively sized. The resulting proposed loan is then sized versus Freddie Mac's minimum sizing parameters as listed below by loan term:

<u>Loan Term</u>	<u>Amortizing</u>	<u>Partial-Term IO</u>	<u>Full Term IO</u>
>5Yr < 7Yr	75% / 1.30x	75% / 1.30x	65% / 1.40x
7 Year Term	80% / 1.25x	80% / 1.25x	70% / 1.35x
> 7 Years	80% / 1.25x	80% / 1.25x	70% / 1.35x

**Prepayments are limited by defeasance but can also use YM.**

Loans with shorter terms or from underperforming markets or specialty loans may require further loan sizing adjustments. **The same DSCR/LTV sizing chart applies to Freddie 1-month floating rate loans which can have 5, 7 and 10-year terms, with the loans sized to 1.00x based on the maximum capped interest rate.** Additional supplemental financing is permitted after >1 year of seasoning, subject to 80% LTV and 1.25x minimum DSCR or 1.00x for floating rate loans, again at their maximum capped interest rate. Any supplemental financing requires an additional full underwriting by Freddie Mac and the original loan seller/servicer. **The fixed rate loans usually limit prepayments with a defeasance requirement but may also use yield maintenance, while floating-rate borrowers can pick from four fixed fee lockout options.**

These loans are pooled into a multi-tranche trust from which Freddie Mac buys senior classes and then guarantees their timely interest and ultimate principal. Exhibit 5 shows the structure and pricing for FREMF 2021-K129 which priced on June 8<sup>th</sup>.

# Exhibit 5. FREMF 2021-K129, Fixed Rate, Priced June 8th, 2021

		Balance (\$000)	Rating Fitch / DBRS	Subord. (%)	Coupon	Dollar Price	Sprd (N)	Yield	WAL (yrs)	Maturity Date
Guarantee	A1	\$151,250	AAA / AAA	18.25	1.34	100	S+9	1.334%	7.49	June 2054
	A2	\$782,874	AAA / AAA	18.25	1.91	103	S+10	1.573%	9.74	June 2054
	AM	\$122,836	NR / NR	7.50	1.65	100	S+15	1.641%	9.94	June 2054
	D	\$85,699	NR / NR	0.00						June 2054
	X1 IO	\$934,124	AAA / AAA							June 2054
	XAM IO	\$122,836	NR							June 2054
	X2A IO	\$934,124	AAA / AAA							June 2054
	X2B IO	\$208,535	NR							June 2054
	X3 IO	\$85,699	NR							June 2054

IO Classes are notional amount and X1, X2 and XAM IOs also benefit from the timely interest guarantee.  
Source: Commercial Mortgage Alert

**During the pandemic, Freddie Mac moved to guarantee a larger portion of K bonds.**

**From K130 on the AM class will have 5% CE.**

Since 2016 Freddie K fixed rate transactions have had 3 guarantee classes: 2 senior time-tranched bond classes (A1, A2 classes), plus an additional junior AM class and multiple subordinate nonguaranteed credit classes. **However, early in the pandemic Freddie increased the guaranteed AM class size to include the previous B and C credit classes resulting in 7.5% credit enhancement (starting with K107 on).** For secondary trading investors should be aware that earlier vintages carried non-guaranteed B and C classes with a 10% and 7.5% credit enhancement respectively, which can be good value as our recent COVID-19 ACMBS credit analysis projected no B or C classes will incur a loss<sup>5</sup>. **Initially, the expansion of the guaranteed AM class was a response to uncertainty created from COVID-19, but its successful execution has encouraged Freddie Mac to further increase the AM class and decrease the first loss portion to 5% credit enhancement going forward, starting with K130.**

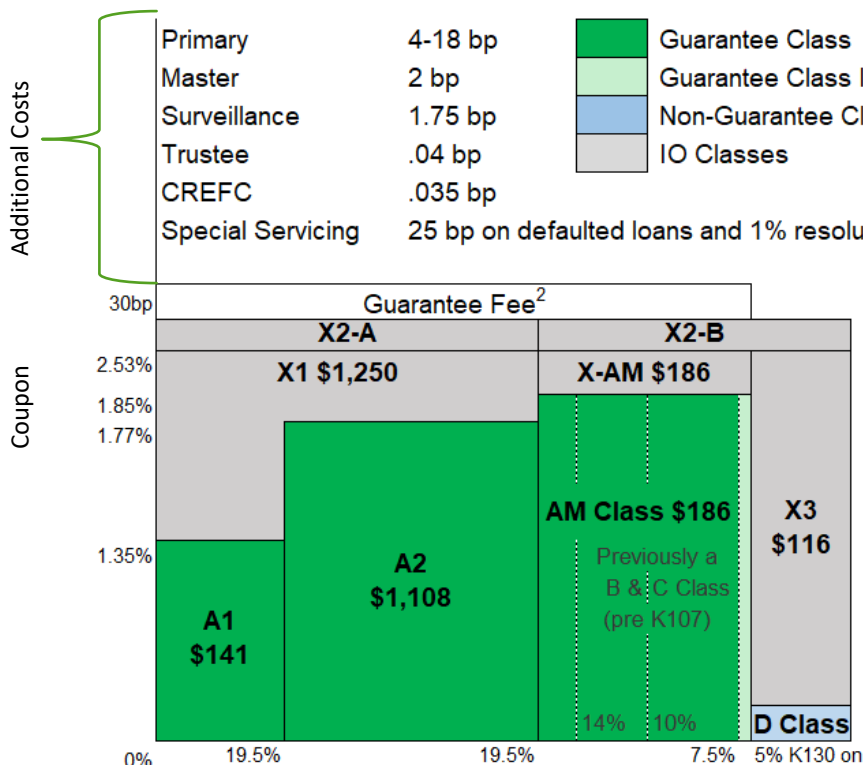
This hybrid guaranteed senior subordinate structure allows defaulted loans to be worked out within the trust with interest advanced by the master servicer, while any realized losses are allocated just up to the guaranteed AM class. In buying the privately placed first loss credit bonds the investor is entitled to additional collateral information and able to appoint a nonaffiliated special servicer that will perform the loan workout. **This effectively transfers the first 7.5% (now 5%) of pool loss risk to expert credit investors that can evaluate and handle loss risks while establishing an appropriate default adjusted yield/price.** When we review historical Freddie K default and loss performance, it will become clear that delinquency has never reached 5% of any Freddie Mac pool, making losses > 5% on any K transaction highly unlikely. This hybrid structure has created relatively stable senior bond pricing and assisted Freddie Mac in originating mortgages (so far in 2021 Freddie Mac created \$42.7 billion K program bonds,

<sup>5</sup> Investors interested in a full credit analysis methodology for K bonds should review: "COVID-19 Impact – K Credit & Other ACMBS?" Darrell Wheeler, Gordon Wolf, April 30, 2020.

including \$2.9B of SB and \$1.0B of ML). **The sale of the first loss credit risk along with the transfer of the loans into a structure that provides loan recovery services via a 3<sup>rd</sup> party special servicer supervised by an investment advisor has many administrative benefits, while still allowing them to roll out programs such as their COVID forbearance response.**

Exhibit 6 illustrates the new 3 senior guaranteed A1, A2, and expanded AM class structure while showing the previous B and C class along with the privately placed D class. The format has the AM class encompass the B and C classes that are no longer issued while creating IOs from A1/A2, and AM/class D. The senior X1 IO and AM IO should be viewed as being exposed to prepayments and the penalties collected. The X-3 IO class appears thick in the illustration as it is supported only by the subordinate credit classes. With no D class interest guarantee it is the most credit exposed IO, as we will demonstrate in our sensitivity analysis.

**Exhibit 6. Traditional Freddie Sample K (AM Class Now Encloses Class B & C)<sup>1</sup>**



1. Boxes are not to scale  
 2. Guarantee Fee of 30 bps is multiplied by the outstanding principal balance of the A-1 and A-2 and A-M classes.  
 Source: Cantor Fitzgerald, Bloomberg

**In addition to the various IO classes (shown in grey), the top of the diagram shows two additional X2 IOs usually purchased by the first loss buyer and shows what is usually a 30bp guarantee fee stripped off the A1, A2, and AM classes for the Freddie Mac guarantee.** The top of the figure lists the additional servicing and trustee costs that are also taken from the loan pool. All of these

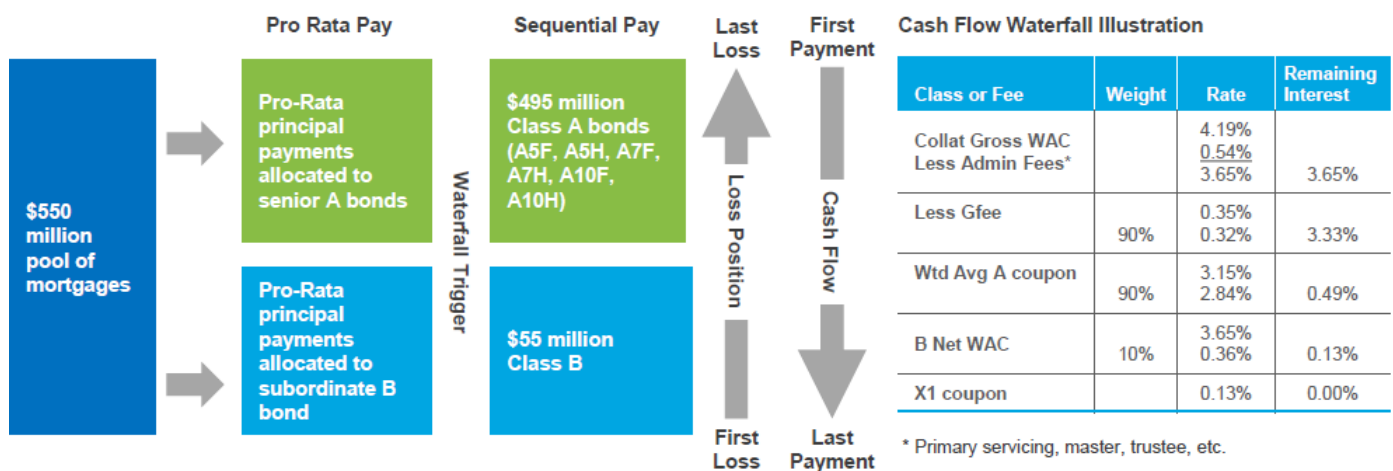
costs beyond the A1, A2, and AM guaranteed coupon have no effect on scheduled payments.

If a loan defaults and the servicer stops making advances, then Freddie Mac's timely interest guarantee requires them to make the original scheduled interest advances to the trust until the loan is resolved. This resolution mechanism is intended to allow the special servicer to maximize the recovery which may take years, but when the loan is resolved any losses will first be absorbed by the Class D (and then Class C and B if they exist). ***If losses reach the AM class the ultimate principal guarantee would require Freddie to post any scheduled principal payments to ensure that class does not take a loss.*** The structure is still exposed to prepayment risk, but fixed-rate K multi-family loans usually have either a 2-year prepayment lockout after which borrowers can defease or a yield maintenance penalty. ***These prepayment deterrents leave bonds mainly exposed to borrower defaults that can eventually cause a full loan reimbursement without a prepayment penalty.*** We should note that the timely interest guarantee benefits the A1 to AM IOs, as Freddie makes up the resulting interest shortfall to the trust on any loan modifications that might reduce the borrower's interest rate.

#### 4. Some Freddie Mac Multifamily Programs Just Replace the Rating Process With A 10% Junior Non-Guaranteed Class

Some Freddie multifamily bond issues use a simple guaranteed senior and non-guaranteed junior securitization structure without a credit rating (K-F, FRESB and others). The senior class guarantee from Freddie Mac would seem to make a formal rating unnecessary, whereas credit investors in the subordinate bond structure are relying upon their own loan credit underwriting to estimate their losses and the resulting returns (which also makes a rating unnecessary). Exhibit 7 uses a FRESB transaction to illustrate the 10% senior junior structure.

**Exhibit 7. Freddie Mac SB Bond Structure with Guaranteed Senior & Single Junior Class**



Source: Freddie Mac article, Multi-family Securitization Small Balance Loan Program, 6/30/2018.

The number of bond classes on deals may vary from our illustration as a small balance pool will have an individual class ending in F (for fixed-rate) with a 5, 7, or 10 year final maturity; or with H (for hybrid arm) and a 20 year final maturity but 5, 7, or 10 year fixed rate terms. These hybrid loans switch to floating rate and are usually call protected with declining points or yield maintenance.

***The market acceptance of this simple 90/10 unrated split highlights how Freddie's strong multi-family loan performance has allowed credit participants to price and purchase the credit risk.*** Given historical collateral performance it seems reasonable to anticipate that Freddie has sold most of the credit risk with the 10% subordinate class sale, while buyers of that first loss class have carefully underwritten collateral and are relying on actual credit losses being significantly <10%. Some of these new bond products have a pro-rata bond class pay structure, so to protect the senior class there is usually a pro-rata to sequential waterfall trigger when only 15% of the original pool balance remains, or under other conditions specific to the loan collateral type.

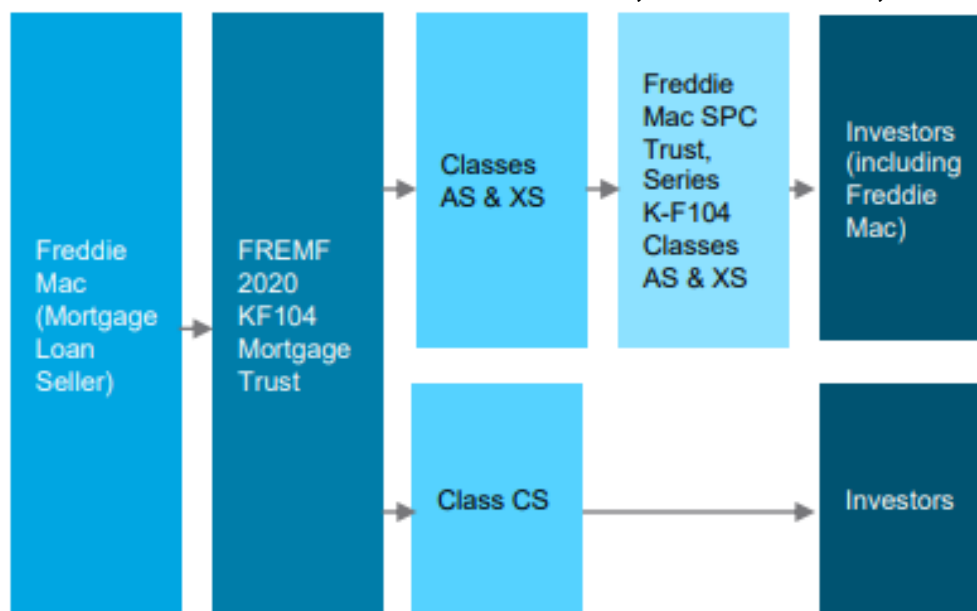


## 5. Floating Rate SOFR Bonds Expand Issuance.

**Floating-rate issuance is starting to dominate with \$22+ billion YTD.**

*In recent years borrowers have been requesting more floating-rate loans and the uncertainty of COVID-19 only increased that demand. At the same time, Freddie Mac has been a leader in issuing SOFR based bonds and after December 2020 moved to only originating SOFR based loans.* These new changes have been popular with both borrowers and investors, driving \$21.9 billion of 2020 issuance and \$22.3 billion 2021 YTD. ***The prepayment flexibility of the floating rate loans and lower rate basis provide an affordable funding option to borrowers that feel their properties can stabilize at better levels, so they are appropriate for many properties that need to recover after COVID-19.*** The resulting loans are usually locked out from prepayment for only 1 year, but can have no lockout if they start at a higher fixed prepayment fee that declines annually to 1%. ***For floating-rate issuance and many of the other new programs Freddie Mac skips obtaining a formal rating and just guarantees the top of the transaction.*** Exhibit 8 presents the structure from a recent floating-rate transaction:

**Exhibit 8. FREMF 2021-KF104 Bond Structure, Priced March 23, 2021.**



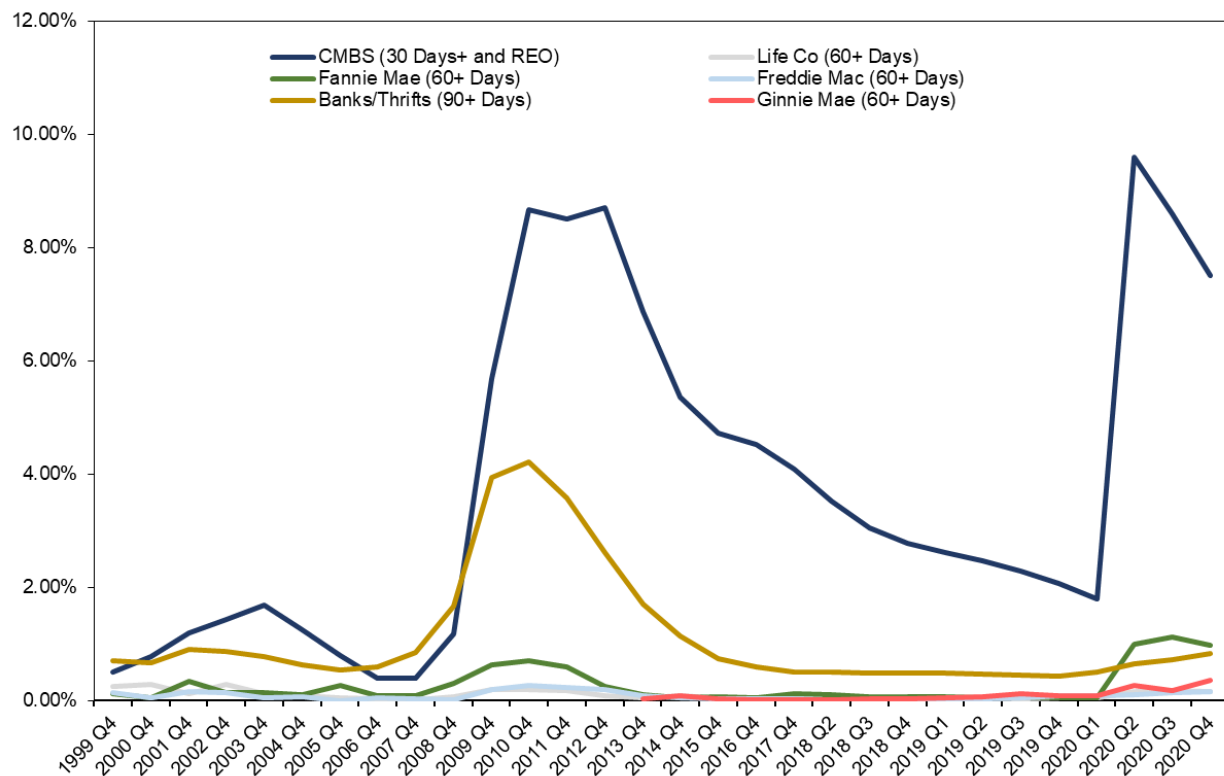
Source: Freddie Mac

KF transactions used to include both a LIBOR and SOFR bond class and Freddie would guarantee the LIBOR loan basis to SOFR, but with the evolution to SOFR based collateral that guarantee is no longer required and the resulting SOFR based bonds are seeing very strong demand (the most recent transaction pricing at 1M SOFR + 24bp). ***This pricing reflects reasonably fast prepayment rates on the loans as most investors expect the WAL will be < 5 years.***

## 6. Freddie Mac's Multifamily Collateral Performance – Continues Through COVID-19

*Interest in Freddie Mac K credit performances is driven by the hybrid credit structure, but also by the potential for involuntary defaults to drive senior bond prepayments.* Exhibit 9 provides historical delinquency rates for Freddie Mac, Fannie Mae, Bank/Thriffs, and CMBS. **Historically Freddie Mac cumulative defaults have been so low that investors have had to consider some type of hypothetical minimum default rate.** Exhibit 9 shows a COVID driven uptick in recent quarters, but for the most part COVID-19 GSE defaults have been very low. Given this stability, it is fairly common for rating agency criteria to reference the GSE's strong performance but then fall back to a higher cumulative default ratio related to private label CMBS (for Freddie K Kroll uses a 50% ratio relative to the higher historical CMBS delinquency). We should also caution that the delinquency figures are not directly comparable as the CMBS delinquency rate in Exhibit 9 includes 30-day and REO loans, which the other sources exclude. But even with that difference, Freddie Mac loan performance is better than all the other products.

**Exhibit 9. Delinquency Rates - CMBS, Life Co, GSEs, Banks/Thriffs**



Source: MBA Commercial/Multi-family Mortgage Delinquency Rates Major Investor Groups Q4 2020, Intex

**Historical data suggests that multi-family borrowers are hesitant to default on Agency related mortgages.**

The low Agency delinquency rates relative to private label CMBS suggest that Agency CMBS borrowers try to avoid defaulting on Agency multi-family collateral, and we would hypothesize these borrowers are motivated to maintain access to these large financing channels. **Some of this performance may also be attributed to Freddie and Fannie's flexible borrower servicing approach during periods of crisis.** COVID-19 provides an example of this flexibility as both Freddie and Fannie quickly rolled out proactive forbearance programs that initially permitted borrowers to skip three months of interest payments that would be then repaid during a 12-month repayment schedule. As COVID-19 continues this program is scheduled to be available to newly troubled borrowers up until September 30<sup>th</sup>, while borrowers which continue to be affected by COVID-19 have been offered delayed repayment and an option that includes additional forbearance. **During COVID-19 Freddie's servicing and guidance to its master and special servicers outlined simple procedures, rather than a more traditional forbearance approach that would have required difficult to implement cash management.** According to Freddie Mac's latest forbearance report<sup>6</sup> these actions have limited loans in forbearance to 1.5% of the total outstanding securitized loan balance, which is significantly less than are currently delinquent among private label CMBS multifamily loans.

**Government rental support should start to reduce forbearance.**

This proactive forbearance approach can be seen in the increase in "other modifications" within Freddie K transactions. In Exhibit 10 we track prepayments, delinquency, and forbearance for three different multifamily programs: i. fixed-rate K, ii. floating-rate KF and iii. small balance FRESB transactions. The right two columns of each table show recent forbearance figures for each program, all of which was implemented without the negotiations and costs that would have been incurred with traditional forbearance requirements. As federal government rental relief becomes available for past due rent payments and current rents, and as tenants find gainful employment, many of these forborne loans have started to reperform. **In fact, in July delinquent and forborne loans decreased another 3bp for the K program, 22bp for KF loans, and 43bp for FRESB (see totals in Exhibit 10).**

<sup>6</sup> Freddie publishes ongoing monthly Forbearance reports. The June 2021 report was released on July 21<sup>st</sup> and is available at: [https://mf.freddiemac.com/research/insight/20210721\\_june\\_2021\\_securitization\\_forbearance\\_report.html](https://mf.freddiemac.com/research/insight/20210721_june_2021_securitization_forbearance_report.html)

# Exhibit 10. Freddie Mac Prepayment, Delinquency, and Modifications (or Forbearance)

Freddie K and KF pools show very little delinquency or forbearance.

	WAC		CPR					Delinquency				
	Curr	Orig	1M	3M	6M	12M	Life	30D	60D	90+	Modifications	Mods+Del.
<b>i. Freddie Mac 10 Year K Transactions</b>												
2014	4.44	4.44	0.0	0.0	0.0	0.0	0.1	0	0	0	1.17%	1.28%
2015	3.92	3.92	0.0	0.0	0.0	0.0	0.0	0	0	0.42	4.62%	5.04%
2016	4.10	4.10	0.00	0.00	0.09	0.18	0.05	0	0	0	2.15%	2.15%
2017	4.10	4.10	4.13	1.52	0.78	0.39	0.14	0	0	0	1.23%	1.23%
2018	4.35	4.35	0.00	0.00	0.00	0.14	0.06	0	0	0.03	1.58%	1.62%
2019	4.14	4.14	0.00	0.00	0.00	0.00	0.02	0	0	0.07	1.76%	1.84%
2020	3.31	3.31	0.00	0.00	0.00	0.00	0.00	0	0	0	0.67%	0.67%
2021	2.96	2.96	0.00	0.00	0.00	0.00	0.00	0	0	0	0.00%	0.00%
Avg.	3.90	3.91	0.50	0.18	0.10	0.09	0.04	0.00	0.00	0.07	1.65%	1.72%
<b>ii. Freddie Mac K-F Transactions</b>												
2015	2.32	2.56	0.0	11.7	6.0	27.9	47.4	0	0	0	-	0.00%
2016	2.67	3.02	10.0	19.8	32.2	27.1	36.7	0	0	1.67	10.93%	12.59%
2017	2.20	3.37	10.2	16.6	23.8	28.6	27.3	0	0	0.85	3.21%	4.06%
2018	1.87	3.93	20.5	25.6	25.9	29.2	20.9	0	0	0	1.11%	1.11%
2019	1.73	3.87	11.4	12.1	14.6	13.0	7.9	0	0	0	1.56%	1.56%
2020	2.45	2.66	3.7	5.6	5.8	1.6	4.4	0	0	0	-	0.00%
2021	2.56	2.57	0.0	0.0	0.0	0.0	0.0	0	0	0	-	0.00%
Avg.	2.27	3.06	6.48	8.43	9.75	8.83	7.93	0.00	0.00	0.10	0.88%	0.98%
<b>iii. Small Balance FRESB Transactions</b>												
2016	4.54	4.60	0.00	6.94	14.42	10.38	7.46	0	0	0.72	10.57%	11.38%
2017	4.23	4.26	8.39	9.67	10.20	7.72	7.23	0.60	0.00	0.16	12.09%	12.85%
2018	4.03	4.05	2.99	11.22	11.31	8.39	6.96	0.16	0.10	4.05	13.00%	17.31%
2019	4.26	4.29	12.02	10.40	9.90	7.82	5.46	0.06	0.00	1.27	15.20%	16.53%
2020	3.59	3.61	12.85	10.98	12.51	3.74	7.15	0	0	0	3.96%	3.96%
2021	3.43	3.43	0.00	0.00	0.00	0.00	0.00	0	0	0	0.06%	0.06%
Avg.	3.99	4.02	7.36	9.10	9.86	6.36	5.85	0.15	0.02	1.30	9.94%	11.41%

Source: Bloomberg data as of July 26th, 2021

Floating-rate loans are performing better than expected, while FRESB may see prepayments.

The fixed-rate Freddie K transactions in the top table have very low delinquency of only 0.07% with only 1.65% of collateral still receiving forbearance. **The second table shows that the post-COVID figures from Freddie's floating-rate pools are also low with only 0.10% > 90 days delinquent and 0.88% forbore.** Traditionally borrowers use floating-rate loans for properties that require further stabilization, so we expected higher defaults from COVID related stress. Yet, for Freddie KF collateral that is clearly not the case. However, for the small balance lending program (labeled FRESB in table iii.), we find that smaller borrowers have required significant support. **We discussed the nature of these smaller FRESB borrowers in our FRESB guide** and would say that the 9.94% FRESB forbearance rate suggests Freddie is providing financing and assistance to borrowers that most require it. **While even the FRESB percentages improved month over month, the higher figure suggests that some portion of these FRESB loans may eventually default and cause some early prepayments for the related guaranteed bonds and losses for first loss bonds.**

Given the guarantees and the subordinate first loss sale, investors need to consider how these prepayment and default rates may translate into prepayment or loss risks. For Freddie K fixed-rate bonds the terms are relatively short (usually 5 to 15 years) and any prepayment before the small open window requires the borrower to defease the loan or pay a yield maintenance penalty.

***This limited prepayment risk means investors initially price deals at zero speed, but then as bonds season and move to a premium or discount dollar price investors must implement some prepayment assumptions along with some defaults to create a conservative worst-case analysis.*** For a discount bond that may still mean 0% CPY, but for a premium bond it could be a CDR vector in combination with a 100% CPY speed.

***For floating-rate K transactions prepayment analysis becomes even more relevant as borrowers frequently face only a fixed 1% prepayment fee and have selected their floating-rate loan for this prepayment flexibility.*** In addition to this common format of a one year prepayment lockout followed by a 1% fee, there can be three other prepayment fee schedules, including one that allows borrowers to prepay immediately, based upon a fee that can start at 3%, 5%, or 7% and decline by 1% a year until reaching the minimum 1% fee. In Exhibit 11 we summarize individual deal prepayment rates for KF transactions issued after 2017. This format lets us see how prepayments can ramp up fairly quickly after issuance as even 2019 and 2020 KF transactions have 12-month speeds > 20% CPR.



## Exhibit 11. CPR Listing - Freddie Mac K Floater Transactions 2017 - Present

Deal Name	Balance (MM)		WAC		CPR					
	Curr	Orig	Curr	Orig	1M	3M	6M	12M	Life	
FREMF 2017-KF27	435	1,402	2.52	3.31	0.0	0.0	26.1	18.3	23.6	
FREMF 2017-KF28	89	1,312	2.56	3.20	0.0	0.0	0.0	0.0	46.4	
FREMF 2017-KF29	267	1,461	2.69	3.47	0.0	37.6	60.9	39.6	33.0	
FREMF 2017-KF30	133	1,296	2.67	3.49	0.0	57.2	34.5	53.4	42.5	
FREMF 2017-KF31	127	1,244	2.69	3.34	0.0	0.0	70.3	73.0	43.2	
FREMF 2017-KF32	216	1,296	2.28	3.53	67.5	31.2	20.6	38.6	35.5	
FREMF 2017-KF33	323	1,401	2.22	3.55	0.0	0.0	0.0	12.0	31.7	
FREMF 2017-KF34	443	1,450	2.09	3.34	0.0	0.0	0.0	34.5	26.6	
FREMF 2017-KF35	363	1,468	1.94	3.22	0.0	4.2	14.8	41.0	31.5	
FREMF 2017-KF36	531	1,315	2.07	3.17	19.3	27.3	14.7	30.3	21.2	
FREMF 2017-KF37	320	1,122	2.25	3.39	0.0	49.4	54.8	46.3	29.0	
FREMF 2017-KF38	510	1,274	2.05	3.36	0.0	11.1	23.3	12.4	22.1	
FREMF 2017-KF39	603	1,313	1.94	3.35	17.7	6.3	3.2	10.4	19.1	
FREMF 2017-KF40	335	1,065	2.30	3.60	0.0	14.4	59.9	42.5	28.1	
FREMF 2017-KF41	213	651	2.02	3.53	69.3	52.6	31.2	25.3	27.0	
FREMF 2018-KF42	466	1,413	2.07	3.64	0.0	64.0	58.4	46.1	28.0	
FREMF 2018-KF43	411	1,265	2.00	3.89	0.0	0.0	40.6	27.1	28.6	
FREMF 2018-KF44	360	1,471	2.10	3.72	58.3	60.0	51.5	49.1	34.7	
FREMF 2018-KF45	383	1,104	2.09	3.98	94.0	69.4	50.0	37.8	28.5	
FREMF 2018-KF46	638	1,220	2.26	4.08	44.5	17.8	9.3	19.3	18.4	
FREMF 2018-KF47	285	1,117	2.16	4.04	0.0	87.5	68.8	63.4	35.4	
FREMF 2018-KF48	793	1,316	1.85	3.93	0.0	23.5	16.7	18.8	15.6	
FREMF 2018-KF49	456	1,240	1.71	3.82	15.2	5.4	22.1	52.9	28.9	
FREMF 2018-KF50	822	1,190	1.82	3.89	0.0	0.0	3.6	14.6	12.6	
FREMF 2018-KF51	435	992	1.76	3.85	0.0	0.0	0.0	23.3	25.6	
FREMF 2018-KF52	451	951	1.69	4.02	59.9	26.2	39.4	33.7	23.6	
FREMF 2018-KF53	568	1,126	1.78	4.02	21.4	21.0	29.5	32.9	23.1	
FREMF 2018-KF54	593	909	1.77	4.06	48.0	24.0	26.0	25.0	15.1	
FREMF 2018-KF55	534	882	1.64	3.97	0.0	32.0	25.4	26.9	17.6	
FREMF 2018-KF56	593	705	1.64	3.91	0.0	15.4	8.0	13.9	6.5	
FREMF 2019-KF57	939	1,123	1.68	4.14	26.1	22.4	20.3	13.4	7.4	
FREMF 2019-KF58	664	1,088	1.69	4.12	20.5	7.3	29.0	23.8	17.7	
FREMF 2019-KF59	782	931	1.71	4.12	0.0	0.0	1.6	15.2	7.2	
FREMF 2019-KF60	817	1,009	1.58	4.02	0.0	5.0	18.1	18.3	8.8	
FREMF 2019-KF61	918	999	1.69	4.09	0.0	0.0	0.0	5.3	4.0	
FREMF 2019-KF62	641	891	1.75	4.11	0.0	55.2	33.1	21.9	13.9	
FREMF 2019-KF63	821	857	1.80	4.14	0.0	0.0	0.0	4.1	2.1	
FREMF 2019-KF64	517	771	1.66	4.00	70.9	40.0	35.5	32.9	18.1	
FREMF 2019-KF65	822	832	1.69	3.82	0.0	0.0	2.3	1.1	0.6	
FREMF 2019-KF66	815	854	1.69	3.83	29.4	10.9	8.6	4.4	2.3	
FREMF 2019-KF67	739	798	1.76	3.75	0.0	26.6	14.3	7.4	4.1	
FREMF 2019-KF68	618	795	1.67	3.61	8.5	2.9	34.9	22.2	14.0	
FREMF 2019-KF69	746	855	1.78	3.71	0.0	0.0	11.2	12.7	7.8	
FREMF 2019-KF70	660	839	1.82	3.54	0.0	20.7	23.4	21.3	14.1	
FREMF 2019-KF71	708	821	1.82	3.54	0.0	0.0	15.7	13.8	9.0	
FREMF 2019-KF72	630	782	1.74	3.48	46.3	18.7	13.6	16.1	12.1	

Deal Name	Balance (MM)		WAC		CPR					
	Curr	Orig	Curr	Orig	1M	3M	6M	12M	Life	
FREMF 2019-KF73	819	851	1.93	3.54	13.1	14.1	7.3	3.7	2.5	
FREMF 2020-KF74	617	812	1.93	3.58	0.0	17.6	31.2	23.9	18.5	
FREMF 2020-KF75	963	968	2.25	3.66	0.0	0.0	0.0	0.5	0.4	
FREMF 2020-KF76	954	962	2.15	3.59	0.0	3.3	1.7	0.8	0.7	
FREMF 2020-KF77	689	850	2.01	2.97	0.0	0.0	13.1	18.9	15.5	
FREMF 2020-KF78	922	922	2.07	2.98	0.0	0.0	0.0	0.0	0.0	
FREMF 2020-KF79	1,045	1,074	2.15	2.25	0.0	10.2	5.3	2.7	2.7	
FREMF 2020-KF80	992	1,012	2.13	2.21	21.4	7.7	3.9		2.2	
FREMF 2020-KF81	855	896	2.16	2.24	0.0	14.8	8.8		4.9	
FREMF 2020-KF82	962	975	2.09	2.17	14.5	5.1	2.6		1.6	
FREMF 2020-KF83	1,003	1,003	2.44	2.51	0.0	0.0	0.0		0.0	
FREMF 2020-KF84	919	1,005	2.68	2.77	32.3	12.2	6.3		11.3	
FREMF 2020-KF85	1,001	1,047	2.89	2.97	0.0	16.5	8.6		5.8	
FREMF 2020-KF86	870	1,066	2.40	0.15	13.1	4.6	33.4		26.3	
FREMF 2020-KF87	1,052	1,052	2.83	2.89	0.0	0.0	0.0		0.0	
FREMF 2020-KF88	841	949	2.67	2.59	0.0	38.5	21.6		15.0	
FREMF 2020-KF89	1,027	1,066	2.66	2.73	0.0	0.0	7.2		5.5	
FREMF 2020-KF90	1,096	1,096	2.75	2.80	0.0	0.0	0.0		0.0	
FREMF 2020-KF91	1,016	1,016	2.75	2.79	0.0	0.0	0.0		0.0	
FREMF 2020-KF92	1,039	1,039	2.65	2.82	0.0	0.0	0.0		0.0	
FREMF 2020-KF93	963	964	2.58	2.64	0.0	0.0	0.0		0.0	
FREMF 2020-KF94	1,063	1,063	2.71	2.76	0.0	0.0	0.0		0.0	
FREMF 2020-KF95	556	1,072	2.49	2.57	0.0	0.0	0.0		0.0	
FREMF 2021-KF96	706	1,100	2.60	2.66	0.0	0.0	0.0		0.0	
FREMF 2021-KF97	936	1,081	2.64	2.71	0.0	0.0			0.0	
FREMF 2021-KF98	966	1,116	2.49	2.56	0.0	0.0			0.0	
FREMF 2021-KF99	1,019	1,019	2.47	2.54	0.0	0.0			0.0	
FREMF 21K-F100	751	1,030	2.39	2.42	0.0	0.0			0.0	
FREMF 21K-F101	1,010	1,010	2.50	2.53	0.0	0.0			0.0	
FREMF 21K-F102	1,015	1,015	2.50	2.51	0.0	0.0			0.0	
FREMF 21K-F103	1,015	1,015	2.49	2.52	0.0	0.0			0.0	
FREMF 21K-F104	987	987	2.39	2.42	0.0	0.0			0.0	
FREMF 21K-F105	1,020	1,020	2.52	2.53	0.0				0.0	
FREMF 21K-F106	982	982	2.38	2.38	0.0				0.0	
FREMF 21K-F107	1,042	1,042	2.36	2.36	0.0				0.0	
FREMF 21K-F108	1,014	1,014	2.65	2.65	0.0				0.0	
FREMF 21K-F109	971	971	2.64	2.63	0.0				0.0	
FREMF 21K-F110	919	919	2.52	2.51	0.0				0.0	
FREMF 21K-F111	1,015	1,015	2.63	2.62	0.0				0.0	
FREMF 21K-F112	1,015	1,015	2.71	2.70	0.0				0.0	
FREMF 21K-F113	1,075	1,075	2.54	2.54						
FREMF 21K-F114	958	958	2.77	2.77						
FREMF 21K-F115	973	973	2.74	2.74						
FREMF 21K-F116	987	987	2.62	2.62						
FREMF 21K-F117	940	940	2.67	2.67						

Source: Bloomberg as of 7/26/2021

Given that a good portion of that prepayment timeframe was hindered by COVID-19 closures we expect prepayment speeds would have been > 30% without COVID. ***These high KF speeds have been consistent over the years as our 2019 K-F article<sup>7</sup> recommended an annual prepayment vector of 0%, 15%, and then 30% thereafter for Freddie KF transactions.*** So, while floating-rate K loans may have 5, 7, or 10-year initial terms, the underlying collateral usually pays off sometime in the first 2 - 5 years of the loan. ***These floating-rate borrowers clearly select this bond structure to have that prepayment option.***

<sup>7</sup> Floating-Rate Loans: Freddie Mac KF CMBS, Darrell Wheeler, November 30, 2018

Overall, Freddie K transactions emerged from COVID-19 with low delinquency and forbearance, which still leaves market participants looking back to the 2007-2009 recession experience to generate some worst-case default scenarios. Exhibit 12 shows historical vintage performance for Freddie Mac multifamily loans originated after 1994.

## Exhibit 12. Freddie Mac Multi-Family Loan Performance

Year	Number of Loans	Total (MM)	UPB (2020 Q4)	Avg. LTV	Avg. DSCR	Avg Coupon	Default UPB	Defaulted %	Avg Severity
1994	122	439		68%	1.48	9.0%	0.8	0.2%	62.5%
1995	230	1082		75%	1.39	8.5%	6.1	0.6%	N/A
1996	377	1349		73%	1.42	8.2%	0.0	0.0%	N/A
1997	325	1651		73%	1.52	1.9%	8.6	0.5%	N/A
1998	583	2799	1.3	71%	1.67	6.9%	9.5	0.3%	53.7%
1999	679	4942	3.1	69%	1.76	7.2%	32.2	0.7%	23.3%
2000	473	4164	8.6	70%	1.52	8.0%	61.4	1.5%	15.0%
2001	716	6291	2.1	69%	1.79	7.0%	15.1	0.2%	58.3%
2002	727	6254	4.3	69%	1.84	6.4%	44.0	0.7%	27.5%
2003	706	6338	46.7	68%	2.06	5.3%	8.5	0.1%	54.1%
2004	755	7575	91.8	72%	1.81	5.0%	17.6	0.2%	33.0%
2005	810	8805	64.9	70%	1.82	5.3%	8.6	0.1%	N/A
2006	941	11465	167.9	67%	1.70	5.9%	183.3	1.6%	27.3%
2007	1364	18034	386.2	68%	1.57	5.8%	93.8	0.5%	40.4%
2008	1353	17548	165.6	68%	1.60	5.6%	242.1	1.4%	21.8%
2009	929	14836	96.0	69%	1.74	5.3%	7.9	0.1%	16.5%
2010	850	12891	517.6	69%	1.65	5.0%	14.2	0.1%	36.6%
2011	1167	18555	5244.4	69%	1.71	4.7%	28.8	0.2%	18.4%
2012	1482	25965	14147.9	68%	1.95	4.0%	7.8	0.0%	43.6%
2013	1397	24414	13567.9	67%	1.97	4.0%	18.8	0.1%	52.7%
2014	1527	26282	15433.0	69%	2.12	3.9%	0.0	0.0%	N/A
2015	3326	43309	24306.0	70%	2.06	3.7%	3.4	0.0%	5.9%
2016	4059	51879	27186.5	70%	1.99	3.9%	2.7	0.0%	77.8%
2017	5285	66088	47006.0	68%	1.84	4.1%	1.0	0.0%	40.0%
2018	5537	68742	60913.3	67%	1.69	4.5%	20.2	0.0%	30.7%
2019	4888	71307	69645.3	68%	1.73	4.3%	2.1	0.0%	28.6%
2020	3649	56990	57786.6	67%	2.01	3.4%	0.0	0.0%	N/A

Source: Freddie Mac Multi-family Loan Performance Database, Overview and Data Dictionary. Summary includes portfolio and securitized loans, but excludes performing modified loans and real estate owned loans.

***The worst vintage was 2006 which saw 1.6% of its loans default at a 27.3% loss rate (circled in green above).*** As previously mentioned, many market participants generally tend to assume defaults could or should trend higher than these historical figures, and frequently reference the higher Fannie Mae-stressed experience (8.55% on the 2007 vintage) or consider some fraction of the private label CMBS experience 2007 experience that reached 14%<sup>8</sup>. ***Given the use of conservative buying assumptions and the recent strong credit performance it is fair to say that credit investors that bought pre-2020 non-guaranteed credit classes have had better than expected default adjusted credit returns.*** This credit performance also likely spurred Freddie Mac to expand the guaranteed AM portion of their transactions.

<sup>8</sup> Investors Interested in Comparing Freddie K Bonds to Fannie DUS Should Review – “GUIDE – Fannie Mae DUS CMBS”, Darrell Wheeler, December 19th, 2018

## 7. Freddie Mac K Bond Sensitivity Analysis

**The A2 and AM classes are well insulated and provide stable spreads in all our scenarios.**

**The A1 gains from prepayments that have penalties, while being exposed to defaults.**

One of the key strengths of Freddie Mac's K bonds is how the credit support, along with prepayment protection, creates steady bond returns. **Exhibit 13 demonstrates this limited default and prepayment sensitivity by applying some extreme prepayment vectors and then layering in a credit default stress for a recently priced transaction and a seasoned premium dollar transaction that has nonguaranteed credit classes.** The analysis uses Bloomberg values to derive a starting spread, yield, and WAL value for each bond class at an initial base zero prepay/default yield (IOs are run at 100% CPY). Then we apply prepayments of 100% CPY, which has very little impact on the bonds. **Next, we apply a 20% CPR, which increases the A1 and IO spreads as they are entitled to prepayment fees (circled in bright green). A third scenario layers in 1% CDR, which demonstrates how the A1 and X1 IO classes have some prepayment risk that increases with dollar price as no premium is collected (see red circled figures).** For a final scenario we apply our custom ACMBS COVID K default stress that is conservatively set based upon each loan's DSCR and debt yield. We developed this vector methodology for a COVID Agency CMBS credit paper<sup>9</sup> and still consider it to be an unrealistic worst case for Agency CMBS, and yet it only affects the premium dollar A1 class and the IO classes to a small degree.

**Exhibit 13. FREMF 2021-K128 and FREMF 2019-K101 Sensitivity (analysis as of 7/27/21)**

FREMF 2021-K128				Base Value*				0 CDR, 100 CPY			20% CPR			20% CPR, 1% CDR***			Custom Underwritten		
Class	Class Balance	Cpn	Ratings (F/D)	\$ Price	Yield	Spread	WAL	Yield	Spread	WAL	Yield	Spread	WAL	Yield	Spread	WAL	Yield	Spread	WAL
A1	\$95,661,746	1.23%	AAA/AAA	\$101.05	1.04%	11.8	6.1	1.04%	12.1	6.1	1.05%	21.3	5.4	0.82%	45.0	2.5	0.97%	27.1	4.3
A2	\$1,172,840,000	2.02%	AAA/AAA	\$105.34	1.41%	19.7	9.5	1.39%	19.9	9.2	1.41%	19.8	9.4	1.39%	19.9	9.1	1.40%	19.8	9.4
AM	\$173,467,000	1.75%	NR	\$101.97	1.52%	30.0	9.7	1.52%	31.1	9.4	1.52%	30.0	9.7	1.52%	30.0	9.7	1.52%	30.1	9.7
X1**	\$1,268,501,746	0.53%	AAA/AAA	\$4.50	1.78%	60.8	9.0	1.78%	60.8	9.0	2.23%	104.2	9.1	0.13%	102.2	8.6	1.23%	5.3	9.0
XAM**	\$173,467,000	0.74%	NR	\$6.68	1.82%	61.7	9.4	1.82%	61.7	9.4	2.49%	126.9	9.7	2.46%	123.6	9.7	2.25%	103.0	9.7
X3**	\$116,943,856	2.79%	NR	\$22.47	3.52%	230.7	9.4	3.52%	230.7	9.4	4.28%	305.0	9.7	4.22%	299.0	9.7	2.26%	99.5	8.9

FREMF 2019-K101				Base Value*				0 CDR, 100 CPY			20% CPR			20% CPR, 1% CDR***			Custom Underwritten		
Class	Class Balance	Cpn	Ratings (F/D)	\$ Price	Yield	Spread	WAL	Yield	Spread	WAL	Yield	Spread	WAL	Yield	Spread	WAL	Yield	Spread	WAL
A1	\$116,067,748	2.19%	/AAA	\$106.20	0.95%	12.8	5.2	0.94%	12.7	5.2	1.05%	50.7	3.4	0.09%	21.9	2.2	0.59%	6.0	4.0
A2	\$1,070,061,000	2.52%	/AAA	\$108.94	1.35%	23.2	8.2	1.32%	21.7	7.9	1.34%	22.8	8.1	1.32%	22.0	7.9	1.35%	23.1	8.1
AM	\$65,686,000	2.23%	/AAH	\$106.50	1.38%	26.0	8.2	1.36%	25.4	8.0	1.38%	26.0	8.2	1.38%	26.0	8.2	1.38%	26.1	8.2
B	\$58,388,000	3.53%	/AL	\$110.44	2.17%	104.6	8.2	2.13%	102.5	8.0	2.17%	104.4	8.2	2.17%	104.4	8.2	2.18%	105.3	8.3
C	\$36,492,000	3.53%	/BBBH	\$106.63	2.67%	154.3	8.3	2.65%	153.6	8.1	2.67%	154.1	8.3	2.67%	154.0	8.3	2.67%	154.3	8.3
X1**	\$1,186,128,748	0.84%	/AAA	\$6.21	1.61%	52.8	7.6	1.61%	52.8	7.6	2.19%	110.4	7.6	0.75%	30.0	7.3	1.72%	63.3	7.7
XAM**	\$65,686,000	1.09%	/AAA	\$8.50	1.51%	39.5	8.0	1.51%	39.5	8.0	2.86%	173.3	8.2	2.72%	159.0	8.2	2.24%	110.6	8.2
X3**	\$204,357,635	1.89%	NR	\$13.63	3.23%	210.9	8.1	3.23%	210.9	8.1	4.53%	339.1	8.3	4.36%	322.6	8.3	2.54%	134.3	8.1

\* Values are for illustration purposes only and may not be market at time of analysis.

Numbers are circled in green to indicate spread pick up, while red circles indicate loss and green square boxes indicate stability.

\*\*Notional Amount

\*\*\*1% CDR has 12 month lag before the 40% loan loss severity is applied.

Source: Bloomberg SYT analysis. Can easily be duplicated by selecting FREMF 2021-K128 with a bond class and selecting SYT.

**The old B and C classes are untouched by the 1% CDR or our custom stress.**

The Bloomberg prices used are approximate, yet the sensitivity makes it fairly clear that the A1, D class, and the IOs have some risk when we layer in the constant 1% CDR rate. Even the pre-COVID B and C credit classes withstand the 1% CDR, but at higher default rates there could be further credit risk in the vintage B and C classes. **With AM credit enhancement now dropping to 5%, the class is more exposed to par prepayments from Freddie's principal**

<sup>9</sup> COVID-19 – K Credit & Other ACMBS? Darrell Wheeler, Gordon Wolf and Eddie Spinelli, April 30, 2020.

***guarantee, but defaults would likely have to exceed 10% with a multifamily liquidation severity higher than 50%, which is very unlikely. The worst historical default rate referenced in Exhibit 12 averaged only 1.6%, while the servicing and workout process implemented by first loss holders should continue to limit loss severity and delay their timing.*** Given that history, we would state that the annual 1% CDR in Exhibit 13 is unlikely, and actual defaults and losses will likely be much lower. Even then only the premium A1 bond, the first loss classes, and some of the IOs are affected by the 20% CPR and 1% CDR assumption, while the A2 and AM bonds delivery stable spreads (see dark green boxes). This is likely why the Freddie multi-family K program trades at the tightest spreads available in Agency CMBS. ***Simply put, investors should expect that likely or potential prepayment and default scenarios may have limited impact on an A1 and almost no impact on A2 and AM classes.***

## 8. Freddie Mac Relative Value – Simple Guaranteed Cash Flows That Have Less Price Volatility

**COVID-19 demonstrated how Freddie K bonds are a safe haven.**

*During the COVID-19 crisis ACMBs spreads rallied, demonstrating a pricing stability benefit derived from the limited credit risk provided by the Freddie timely interest and ultimate principal guarantee.* Relative to other Agency CMBS products Freddie K bonds generally trade 2 to 4 basis points tighter than Fannie DUS bonds, and significantly tighter than Ginnie Mae Project Loans which have longer loan terms that create more prepayment uncertainty. Exhibit 14 shows Agency CMBS spreads back to 2015, which include the 2020 COVID-19 widening and the 2016 taper tantrum when fixed-income sold off in anticipation of higher rates. During the 2016 dislocation the 5 and 10 year Freddie K spreads widened only 48 and 52 basis points respectively, while the 10-year CMBS last cash flow widened by 82bp. **During COVID-19 the volatility differential was even greater, as CMBS spreads widened to 325bp while Freddie A2s only hit 100bp.** As COVID-19 continues as an ongoing economic risk Freddie K A1, A2 and AM spreads will likely remain near historical tightness as market participants see significant value in the guarantee.

**Exhibit 14. Agency CMBS and CMBS LCF Spreads**



Source: Cantor Fitzgerald (as of 8/2/2021)

**Freddie Mac's K floating rate spreads of ~20bp seem cheap for their expect WAL.**

**During COVID-19 Freddie Mac floating-rate KF bonds also widened to LIBOR + 80bp and SOFR + 100bp.** However, ongoing economic uncertainty quickly had market participants looking for recession protection causing KF floating-rate paper to recently trade at spreads in the low 20bp area (or tighter for seasoned deals as demand for short duration floating-rate paper remains heightened). **With triple-A floating-rate consumer ABS trading near zero, we see the guaranteed Freddie floating-rate paper as one of the better guaranteed floating spreads available in today's market.** Private floating rate CMBS spreads widen during recessions as extension risk concerns arise, but with the K floaters the Freddie guarantee ensures the maturity will not exceed the



original stated loan term. **Yet our current expectation is that these bonds will see speeds increase in year 2 and 3 creating WALs < 5 years which makes their current SOFR + 24bp spread an attractive relative value.**

**Freddie's low delinquency rates also mean the older credit bonds are very unlikely to incur losses, so they offer good value.** Recently the B class has been trading at swaps +120bp and the C class has been swaps +145bp. **This credit curve has recovered substantially since the depths of the COVID crisis as more forbore loans have continued to perform.** Yet our extreme 1% CDR and custom default analysis suggests these credit classes are very low risk, so the credit curve offers relatively safe triple-digit spreads. **As the collateral performance continues to improve and stabilize, we would expect that these credit bonds could receive rating agency upgrades.** Finally, Freddie IOs of 70bp on the senior class and in the low 200bp range on the lower IO are noteworthy given the strong historic default performance, but investors need to run performance sensitivity stress analysis as there will be different sensitivities depending on thickness of the WAC created from any Treasury price movement from the time at which the loans were formed.

**Freddie K's key value benefits are their collateral, guarantee, and price stability.**

There is significant historical price data for the various Freddie-backed CMBS classes, which suggests there is an opportunity to create rich/cheap indicators versus other fixed income spread products. **Yet, in the current uncertain environment we resist undertaking such analysis as it misses the key product benefit - - that of providing simple, secured, and guaranteed cash flows that are relatively stable during market dislocations.** Overall, the spreads in Exhibit 14 suggest that Freddie K CMBS with their guarantees and the strong multi-family collateral have value in an uncertain economy.



## Appendix A. Agency CMBS Spreads History

	1/7/21	1/15/21	1/22/21	1/29/21	2/5/21	2/12/21	2/19/21	2/26/21	3/5/21	3/12/21	3/19/21	3/26/21	4/1/21	4/9/21	4/16/21	4/23/21	4/30/21	5/7/21	5/14/21	5/21/21	5/28/21	6/4/21	6/11/21	6/18/21	6/25/21	7/2/21	7/9/21	7/16/21	7/23/21	8/2/21	
<b>Fannie Mae</b>																															
FNMA GeMS A1	27	27	27	15	14	14	12	13	13	13	14	6	6	6	8	8	8	6	6	6	6	6	6	6	7	7	7	10	11	14	14
7/6.5 DUS	25	25	25	16	11	10	5	12	9	10	12	11	11	11	9	8	8	8	8	7	7	8	7	10	11	11	15	16	17	17	
10yr FNMA GeMS A2	32	32	32	21	20	20	19	20	20	20	20	20	20	20	17	17	16	16	14	14	13	13	12	12	12	12	15	18	22	22	
10/9.5 DUS	35	35	35	25	22	21	19	23	25	24	25	20	18	18	17	17	16	16	16	15	14	13	13	15	15	15	21	24	26	28	
Fannie SARM (DM)	40	40	40	25	24	23	19	23	25	25	26	26	26	25	26	26	26	24	24	23	23	23	23	22	22	22	22	22	22	25	
CMBS LCF-DUS A2	40	37	30	39	42	43	43	41	43	44	47	54	50	50	56	56	57	57	55	56	54	54	53	51	52	53	47	44	42	40	
<b>Freddie Mac K</b>																															
5 Yr K A1	26	26	26	15	14	14	10	11	8	6	9	9	9	9	9	8	8	8	8	7	7	7	9	10	10	10	10	11	11	14	
10 Yr K A2	29	29	29	19	18	18	17	18	18	18	18	18	18	16	14	13	14	13	12	12	12	12	10	11	11	11	14	16	18	20	
10 Yr K AM	34	34	34	24	23	23	22	23	23	23	25	25	25	25	21	19	19	19	19	17	17	17	15	16	16	16	19	21	23	25	
CMBS LCF-K A2	46	43	36	45	46	46	45	46	50	50	54	56	50	50	57	59	60	59	58	59	56	55	56	55	56	57	54	52	50	48	
K10 Floater (DM)	26	26	26	20	18	18	18	18	18	20	24	25	25	25	26	25	24	24	24	23	23	23	23	22	22	22	21	21	24	24	
<b>Ginnie Mae</b>																															
4 Yr GNR	70	70	70	62	62	62	60	60	60	62	62	60	65	65	65	68	68	68	68	68	68	68	68	68	68	69	69	70	70	70	
5 Yr GNR	74	73	73	72	71	69	68	66	64	66	68	69	71	71	70	70	69	69	69	69	69	69	69	69	69	70	70	71	71	71	
7 Yr GNR	78	78	78	70	70	70	68	68	68	70	70	70	75	75	75	70	70	70	70	70	70	70	70	70	70	70	71	71	72	72	

Source: Cantor Fitzgerald as of 8/2/2021

## Appendix B. Summary - CMBS Multifamily Securitization Programs

Product	GNR	Fannie Mae DUS	Freddie Mac K	Conduit CMBS
<b>2021 Issuance/ Outstanding</b>	<b>\$31.2B/\$118.4 billion</b>	<b>\$34.3B / \$341.82B</b>	<b>\$42.7B/ \$314.9B</b>	<b>\$17.3B/382.6B</b>
<b>Collateral Description</b>	Multi-family or senior housing loans originated by a Fair Housing Act "FHA" approved lender that are insured by FHA or the Department of Agriculture Rural Housing Service. Loans have 35 or 40 year terms with full amortization and are on either stabilized multi-family properties (Project loan Commitments "PLC") or Construction Loan Commitments (CLC).	30 approved Delegated Underwriters & Servicers create individual property loan pass through certificates that settle after 30 to 45 days (DUS MBS). DUS lenders originate the loans without Fannie Mae preapproval as they service the loan and share in its first loss. Loans are prepayable usually with a yield maintenance penalty.	20 Seller/Servicers create \$5-100 million nonrecourse loans that are subject to Freddie credit approval. Loans usually have initial 2 year lockout followed by defeasance period ending 3 months prior to the maturity date. Loans can incur future subordinate debt subject to DSCR and LTV tests. Floating-rate loans usually have 1 year lockout and 1% prepayment penalty.	Fixed-rate Multi-loan CMBS pools usually contain 10 - 30% multi-family exposure, which diversifies the pool's property type specific risk. Most loans are 10 year fixed-rate loans with a 9.75 year prepayment protection from defeasance or yield maintenance.
<b>Bond Structure</b>	Ginnie Mae approved sponsors buy and pool FHA insured loans from originator/ issuers. Ginnie Mae guarantees timely payment of principal and interest. While collateral is locked out and has prepayment fees, there is no prepayment guarantee. Bond Classes are typically time tranching, have an IO and many other planned classes or even a Z interest accrual class.	GeMS deals are assembled from pooling the various pass through certificates and usually have a shorter and a longer class. Fannie guarantees full and timely payment of interest and principal. No guarantee on prepayment penalties, and loan yield maintenance may differ from required bond yield maintenance due to coupon basis and a final six month loan open period.	Freddie Mac guarantee on two senior time tranching classes, and AM and some IO classes. Guarantee covers timely interest payment, payment of principal at the maturity date of each loan, reimbursement of any realized losses and certain trust expenses and ultimate payment of principal by the assumed final distribution date. Current structure uses a single non-guaranteed first loss class that is 5% of pool or 10% for FRESB or KF transactions.	All properties types are pooled, which dilutes multi-family property exposure. With no guarantee, losses are applied sequentially starting with the lowest credit class, while prepayments are applied to the senior shortest WAL <i>pari passu</i> triple-A rated classes and then sequentially down into the bond structure.
<b>Loan Recovery Process</b>	If a borrower misses a payment the issuer undertakes foreclosure and appropriate action which includes the collection of insurance and guaranty benefits. If this is insufficient to make the mortgage P&I payments then Ginnie Mae is responsible for the shortfall.	Fannie Mae guarantee of timely interest and principal causes them to remove loans from the pool for workout recovery while continuing to make the scheduled interest and principal payments until loan was scheduled to be open to prepayment. Originator shares loss with Fannie Mae.	Defaulted loan worked out within the trust subject to pooling and servicing agreement. Originators do not share in loss. If a defaulted loan reaches its maturity the principal guarantee pays principal to the guaranteed classes.	Loans are worked out within the trust by the special servicer subject to the pooling and servicing agreement.
<b>Rating Agency Assessment</b>	No rating required.	Given full guarantee of timely interest and principal, no rating required..	Senior guarantee levels are rated AAA and junior AM guarantee class can also receive a non-guarantee rating. Current single non-guaranteed class is not rated as it is a first loss.	Levels justified by collateral leverage and credit enhancement.
<b>Typical Ticker &amp; Series Naming Convention</b>	GNR-20yy-xx	FNA 20yy-Mxx	FREMF 20yy + - K5xx: 5 yr fixed-rate loans K7xx: 7 yr fixed-rate loans K0xx: 10 yr fixed-rate loans K15xx: 12-15 yr fixed-rate KFxx: Floating-Rate Loans	Program 20yy-Series
<b>Information Sources</b>	<a href="http://Ginniemae.gov">Ginniemae.gov</a> or <a href="http://Structuredginniemae.gin.nienet.com/multifam/">Structuredginniemae.gin.nienet.com/multifam/</a>	<a href="http://Fanniemae.com/port/funding-the-market/multi-family">Fanniemae.com/port/funding-the-market/multi-family</a>	<a href="https://mf.freddiemac.com/?gclid=EAJaIQobChMIwsS2ufOr8QIVwwMGAB13xAFHEAAYASAAEgKYqvD_BwE">https://mf.freddiemac.com/?gclid=EAJaIQobChMIwsS2ufOr8QIVwwMGAB13xAFHEAAYASAAEgKYqvD_BwE</a>	
<b>Risk Based Capital</b>	0% RBC	20% RBC	20% RBC on guaranteed Classes.	20% on AAA Super Senior Classes.

Source: Fannie Mae, Freddie Mac, and Ginnie Mae websites; Cantor Fitzgerald



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