



Enhancing Your Portfolio by Investing in MBS

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Agenda



Agenda

- Explain MBS
- Risks
- MBS data & analytics *(using Bloomberg Screens)*
- Securities

What is an MBS?

What is MBS?

- MBS
 - Mortgage-Backed Security
 - Also referred to as RMBS – Residential Mortgage-Backed Securities
 - Single family homes
 - Also referred to as a “pass-through”
 - A portion of the principal and interest payments are passed through to the investor

What is MBS?

- A MBS represents a claim on a cash flow stream from underlying mortgage loans that have been securitized

What is securitization?

- Financial institutions originate mortgage loans and sell a bulk of them to a trust
- The trust assembles all these loans and others into collections, or “pools”
- The pools receive a guarantee/credit enhancement during this process
- Securities are issued which are backed by the mortgages; investors receive monthly cashflows (P&I) from the underlying mortgages

How Does an MBS Work?

- Principal & Interest payments are collected from the homeowners by the mortgage originators/trustee who service the loans
- The payments are then aggregated and “passed through” to the investors

The Flow of an MBS

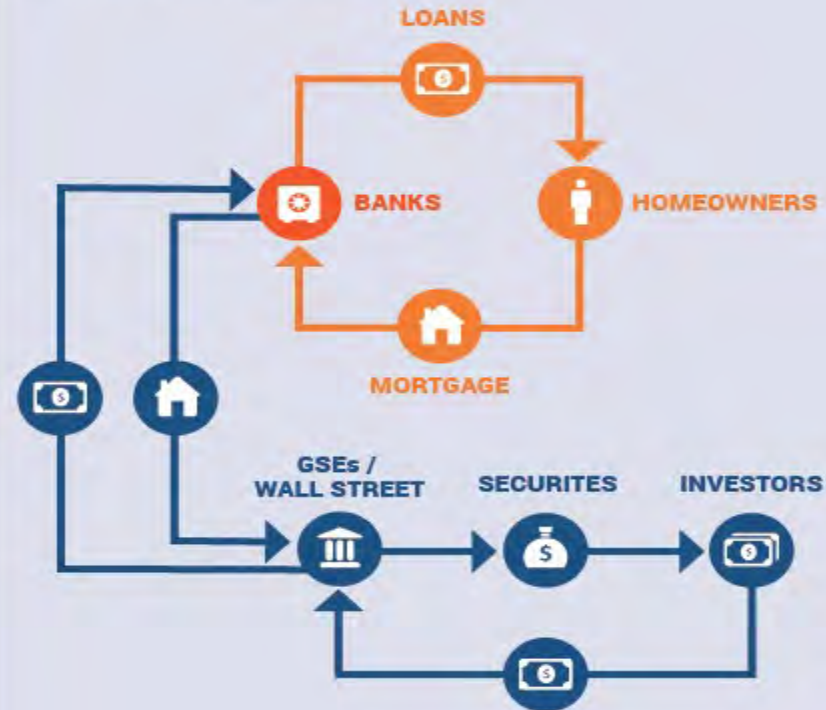
Before Securitization

- BANKS MAKE LOANS
- BANKS HOLD LOANS



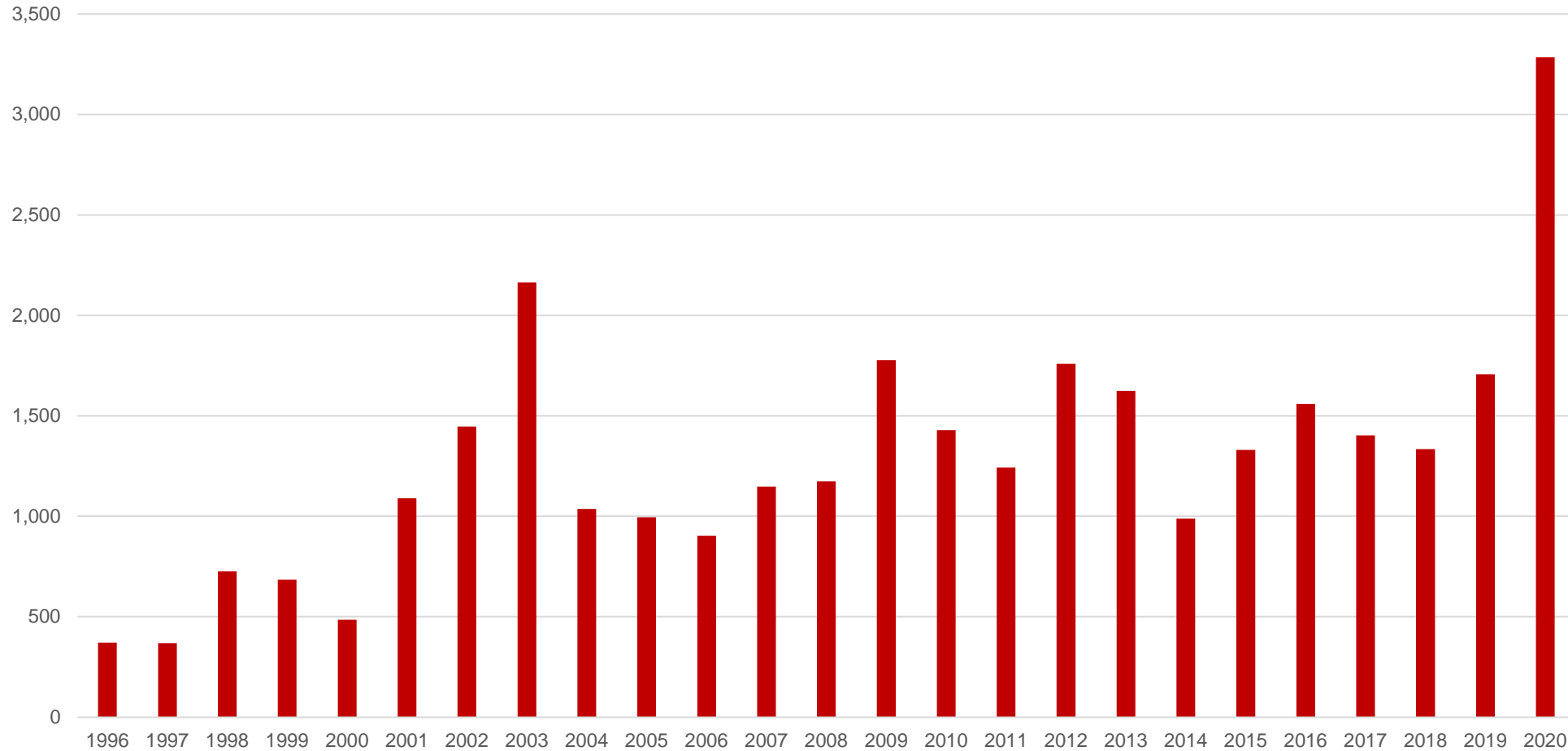
After Securitization

- BANKS MAKE LOANS
- INSTEAD OF HOLDING LOANS, BANKS SELL LOANS TO WALL STREET
- BANKS CAN MAKE MORE LOANS



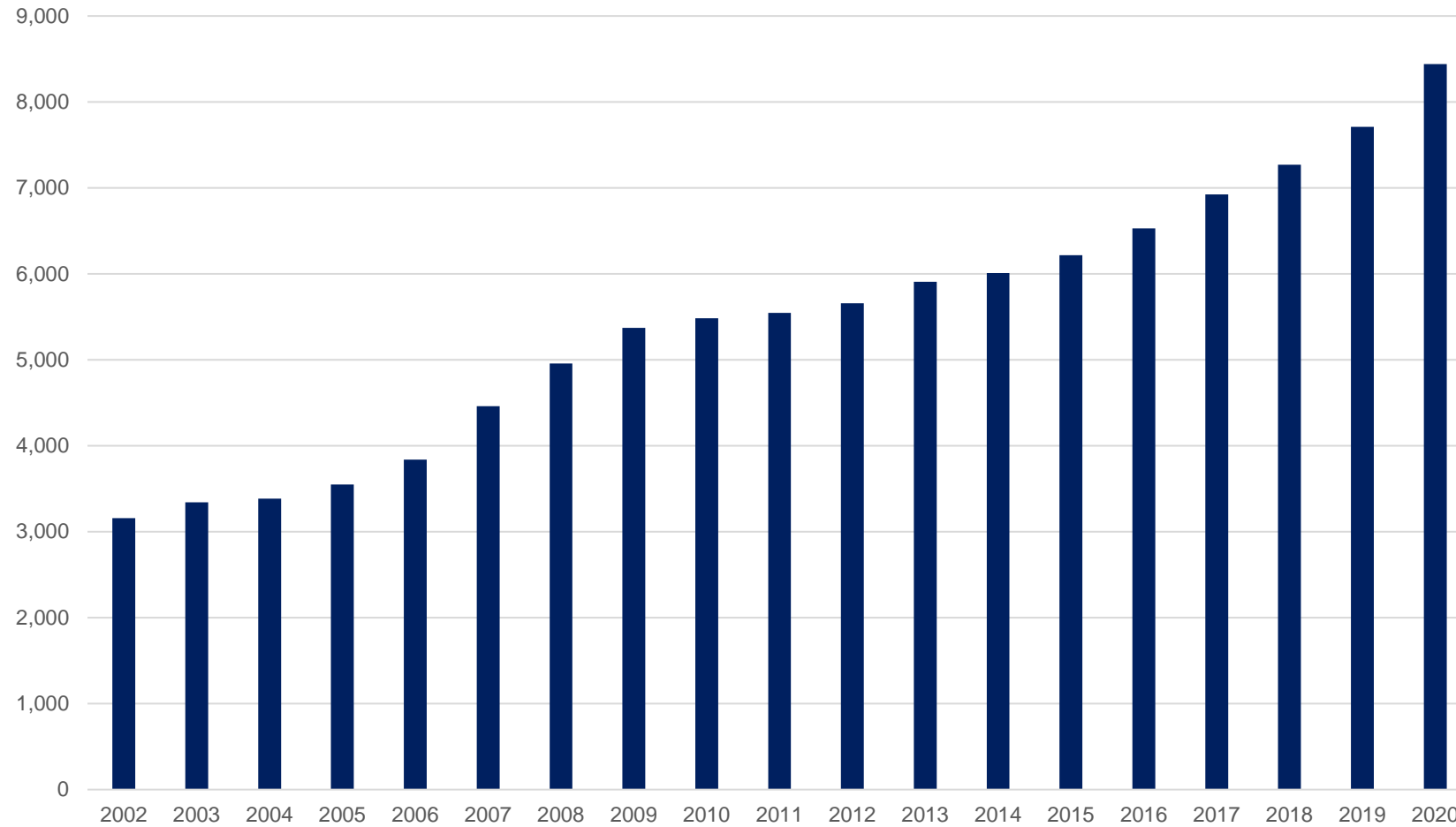
Agency MBS Issuance

Agency MBS Issuance (Billions)



Outstanding Agency MBS

Agency MBS Outstanding (in Billions)



Who issues MBS?

Who issues MBS?

- Main issuers
 - Government National Mortgage Association (GNMA)
 - Also known as Ginnie Mae
 - Backed by the government
 - Ticker is “GNR”
 - Guaranteed the first mortgage pass-thru security in 1968

GNMA Pools

- Government owned and operated agency to promote homeownership to low to middle income families
- FHA/VA loans
- Generally lower income borrowers
- Smaller loan size
- 0% risk weighted
- Backed by the full faith and credit of the US Government

Who issues MBS?

- Main issuers
 - Federal National Mortgage Association (FNMA)
 - Also know as Fannie Mae
 - Government-sponsored enterprise (GSE)
 - Also known as an “agency MBS”
 - Ticker is “FNR” of “FN”

Who issues MBS?

- Main issuers
 - Federal Home loan Mortgage Corporation (FHLMC)
 - Also know as Freddie Mac
 - Government-sponsored enterprise (GSE)
 - Also know as an “agency MBS”
 - Ticker is “FHR”

FNMA & FHLMC Pools

- Privately owned and operated government sponsored enterprises (GSEs) to promote liquidity in the secondary market for mortgages
- Conventional mortgage loans
- Medium income borrowers
- Medium loan size
- 20% risk weighted
- Timely payment of principal and interest is guaranteed by FNMA & FHLMC

Advantages of an MBS?

- Attractive yielding asset
 - Fits well within most investment portfolios
- Excellent credit quality
- Built-in cashflow ladder
- Good liquidity and can be used as collateral for borrowing

Choosing the right MBS

- MBS pools come in maturities similar to mortgage loan offerings of:
 - 30yr
 - 20yr
 - 15yr
 - 10yr
- Like mortgages, they also come in a variety of coupons

Choosing the right MBS

- There are numerous individual options inside each category of a MBS pool
 - For example, if looking for a 10yr MBS pool, each pool could have different:
 - Coupons
 - Seasoning
 - Geographic distribution
 - Collateral make-up (LTV, FICO, etc.)
- This allows the investor to select a better performing pool or one that fits their A/L parameters better

Risks of MBS

Risks of an MBS?

- An MBS can pay and pre-pay differently than expected/modeled
 - Prepayment is the ability of the homeowner to prepay (pay extra) principal at any time without penalty
- Investor needs to evaluate the yield and maturity under a range of prepayments

What are prepayments?

- A homeowner makes their monthly mortgage payment (includes principal and interest)
 - This is a normal paydown of MBS
- If a homeowner makes more than their normal monthly mortgage payment, this is what is called a prepayment

What are prepayments?

- Prepayments can come from:
 - Homeowner paying off mortgage
 - More income
 - Homeowners refinancing their mortgage
 - Rate changes
 - Homeowners selling their house and paying off mortgage
 - Lifestyle change

Determinants of Prepayments

- Homeowner paying off mortgage
 - Homeowners who have an older mortgage (loan age), have more incentive/ability to payoff mortgage
 - Less left on mortgage, more income, etc.
 - Newer loans are less likely to refinance due to the costs of a mortgage origination/refinance
 - Some older loans never re-fi either

Determinants of Prepayments

- Homeowner refinancing mortgage
 - As current mortgage rates fall, homeowners will find it advantageous to refinance their mortgage loan into a newer, lower rate mortgage (reduces their monthly payment)
 - Current loan is paid off and funds get passed through to the investor
 - Again, newer loans less risk of refinancing, unless rates fall significantly more

Determinants of Prepayments

- Homeowner sells their house
 - When a homeowner sells their house, this pays off their mortgage, and this lump-sum payment flows down to the investor
 - This is known as housing turnover

How do we measure prepayments?

- MBS investors usually use prepayment rates using one of two methods:
 - Conditional Payment Rate (CPR)
 - Public Securities Association (PSA) benchmark

Measuring Prepayment Rates - CPR

- Conditional Payment Rate (CPR)
- An estimate of the percentage of outstanding principal that will repay over the next 12 months at a constant rate
- CPR measures prepayments, it does not include regular principal payments

Measuring Prepayment Rates - CPR

- 10% CPR means an additional 10% of cashflow payments over and above the normal paydown
- A 0 CPR means there was no prepayments of principal that month
- The higher the CPR, the “faster” the MBS is paying down
 - A bond paying at a 25 CPR is paying faster than a bond paying at a 12 CPR

Measuring Prepayment Rates - PSA

- Public Securities Association (PSA)
- PSA takes into account the tendency for loans to prepay faster as they age
 - Remember, newer loans tend to not refinance much and less incentive for turnover
- PSA acknowledges that prepayments will change during the life of the mortgage

Measuring Prepayment Rates - PSA

- PSA assumes a ramp of the prepayment rate starting at 0.2% in the first month, and as the mortgage ages, the higher the chance of prepayment
- It assumes a gradual rise in prepayments, which peaks after 30 months of seasoning

Measuring Prepayment Rates - PSA

- Again, a higher PSA speed, the “faster” the bond is prepaying principal
- Many investors look at both PSA and CPR when analyzing an MBS
 - But prefer to use just one measure when looking at the base case
 - Most prefer CPR

Predicting Prepayments

- Depends on the pool of mortgages and by analyzing the “pool statistics”, an investor can make some estimate of future cashflows
- There are a number of items (coupon, seasoning, etc.) to consider when analyzing an MBS that will determine the estimate of prepayments and the performance of the bond

How to analyze an MBS

Key Items to Analyze

- WAC – Weighted average coupon
 - Average loan interest rate weighted by the principal balance of each individual loan
 - A lower “WAC” in a potentially rising interest rate environment may mean the MBS will not prepay as fast
 - Conversely, a “high WAC” MBS means the pool may prepay faster if rates fall

Key Items to Analyze

- WAM – Weighted Average Maturity
 - Average loan maturity weighted by the principal balance of each individual loan
 - Tells the investor the average term of the mortgages – a WAM of 120 months tells the investor this MBS pool is made up of 10 yr mortgage loans

Key Items to Analyze

- WALA – Weighted Average Loan Age
 - Average loan age weighted by the principal balance of each individual loan or the average amount of time each individual loan has been outstanding
 - Newer loans typically tend to prepay slower since the homeowner just completed this mortgage loan

Key Items to Analyze

- Loans in pool
 - Measures the number of loans in the MBS pool
 - The higher the number of loans, the more protected the investor is from a small amount of loans prepaying
 - An investor has a high risk of prepayment with an MBS with 5 loans in the pool versus a MBS pool with 4500 loans

Analyzing an MBS pool

- Best and easy place to analyze an MBS pool is on Bloomberg
 - Computer that your broker has access to and can provide analytical screens on bonds
- Main screen needed for preliminary analysis is the DES & YT screens, Description & Yield Table, from Bloomberg
 - Provides a wealth of information

Description Page (DES)

FN MA4417 Mtge		Export		Page 1/2		Security Description	
P 100% FNCI 1.5 N		2.178(179)0		CUSIP 31418D4B5		Pool Level 95 Buy 96 Sell	
Summary		Comments					
Pool	FN MA4417	16) Seasoning		FNCI 1.5 N		As Of 08/2021	
Type	(CI) UMBS Conventional Conv 15 years...	17) Vintage		FNCI 1.5 2021		Issue Date 08/01/2021	
Traits	30/360					Maturity Date 08/01/2036	
1) Seller Multiple		Issuer FNMA					
12) Pool Information PDI						Balance	
Coupon	1.500	WAC	2.178	Orig WAC	2.178	Factor	1.00000000
		WARM	179	Orig WAM	179	Orig Amt	1,120,745,244
		WALA	0			Curr Amt	1,120,745,244
13) Collateral Information CLC						Prepay CPR PSA	
WAOLTV	55	AOLS	302,175	Orig TPO	62.17	1 Month	
WAOLTV-HPI*	55	WAOLS	364,051	Curr TPO	62.17	3 Month	
WAOCLTV	55	MAXLS	895,000	Green Bond	N	6 Month	
WAOCS	772	WAOLT	179			1 Year	
		WAODTI*	32			Life	
14) # Loans	3,715	Delay	54 (24)			18) States %UPB	
TRACE Eligible						California 40.5	
						Texas 6.2	
						Florida 4.2	
15) Paydown Information PDI PERF						*Value calculated by Bloomberg	
Prepay History		Aug21					
1 Month CPR							
3 Month CPR							
6 Month CPR							
12 Month CPR							



Description Page (DES)

FN MA4417 Mtge		Export	Page 1/2		Security Description	
100% FNCI 1.5 N		2.178(179)0	CUSIP	31418D4B5	Pool Level	95 Buy 96 Sell
Summary		Comments				
Pool	FN MA4417	16) Seasoning	FNCI 1.5 N	As Of	08/2021	
Type	(CI) UMBS Conventional	17) Vintage	FNCI 1.5 2021	Issue Date	08/01/2021	
Traits	30/360			Maturity Date	08/01/2036	
1) Seller	Multiple	Issuer FNMA				
12) Pool Information PDI				Balance		
Coupon	1.500	WAC	2.178	Orig WAC	2.178	
		WARM	179	Orig WAM	179	
		WALA	0			
13) Collateral Information CLC				Prepay		
WAOLTV	55	AOLS	302,175	Orig TPO	62.17	
WAOLTV-HPI*	55	WAOLS	364,051	Curr TPO	62.17	
WAOCLTV	55	MAXLS	895,000	Green Bond	N	
WAOCS	772	WAOLT	179		1 Year	
		WAODTI*	32		Life	
14) # Loans	3,715	Delay	54 (24)	18) States	%UPB	
TRACE Eligible				*Value calculated by Bloomberg		
15) Paydown Information PDI PERF						
Prepay History	Aug21					
1 Month CPR						
3 Month CPR						
6 Month CPR						
12 Month CPR						

Ticker

Issuer FNMA

Pool info is preliminary and is subject to change

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FN MA4417 Mtge		Export		Page 1/2		Security Description	
P 100% FNCI 1.5 N		2.178(179)		CUSIP 31418D4B5		Pool Level 95 Buy 96 Sell	
Summary		Comments					
Pool	FN MA4417			16) Seasoning	FNCI 1.5 N	As Of	08/2021
Type	(CI) UMBS Conve	years...		17) Vintage	FNCI 1.5 2021	Issue Date	08/01/2021
Traits	30/360					Maturity Date	08/01/2036
1) Seller Multiple		Issuer FNMA					
12) Pool Information PDI						Balance	
Coupon	1.500	WAC	2.178	Orig WAC	2.178	Factor	1.00000000
		WARM	179	Orig WAM	179	Orig Amt	1,120,745,244
		WALA	0			Curr Amt	1,120,745,244
13) Collateral Information CLC						Prepay	CPR PSA
WAOLTV	55	AOLS	302,175	Orig TPO	62.17	1 Month	
WAOLTV-HPI*	55	WAOLS	364,051	Curr TPO	62.17	3 Month	
WAOCLTV	55	MAXLS	895,000	Green Bond	N	6 Month	
WAOCS	772	WAOLT	179			1 Year	
		WAODTI*	32			Life	
14) # Loans	3,715	Delay	54 (24)			18) States	%UPB
TRACE Eligible				Pool info is preliminary and is subject to change		California	40.5
15) Paydown Information PDI PERF				*Value calculated by Bloomberg		Texas	6.2
Prepay History	Aug21					Florida	4.2
1 Month CPR							
3 Month CPR							
6 Month CPR							
12 Month CPR							

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FN MA4417 Mtge		Export		Page 1/2		Security Description	
P 100% FNCI 1.5 N		2.178(179)0		CUSIP 31418D4B5		Pool Level 95 Buy 96 Sell	
Summary		Comments					
Type (CI) UMBS Conventional Conv 15 years...		16) Seasoning FNCI 1.5 N		As Of		08/2021	
17) Vintage FNCI 1.5 2021		Issue Date		08/01/2021		Maturity Date	
08/01/2036							
11) Seller Multiple		Issuer FNMA					
12) Pool Information PDI						Balance	
Coupon		2.178		Orig WAC		2.178	
		179		Orig WAM		179	
		0					
13) Collateral Information CLC						Prepay	
WAOLTV		55		AOLS		302,175	
Orig TPO		62.17				1 Month	
WAOLTV-HPI*		55		WAOLS		364,051	
Curr TPO		62.17				3 Month	
WAOCLTV		55		MAXLS		895,000	
Green Bond		N				6 Month	
WAOCS		772		WAOLT		179	
				WAODTI*		32	
14) # Loans		3,715		Delay		54 (24)	
				Pool info is preliminary and is subject to change		18) States	
TRACE Eligible						%UPB	
15) Paydown Information PDI PERF				*Value calculated by Bloomberg		California	
Prepay History		Aug21				Texas	
						Florida	
						4.2	
1 Month CPR							
3 Month CPR							
6 Month CPR							
12 Month CPR							

Collateral



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FN MA4417 Mtge		Export		Page 1/2		Security Description	
P 100% FNCI 1.5 N		2.178(179)0		CUSIP 31418D4B5		Pool Level 95 Buy 96 Sell	
Summary		Comments					
Pool	FN MA4417	16) Seasoning	FNCI 1.5 N	As Of	08/2021		
Type	(CI) UMBS Conventional Conv 15 years...	17) Vintage	FNCI 1.5 2021	Issue Date	08/01/2021		
Traits	30/360			Maturity Date	08/01/2036		
1) Seller	Multiple	Issuer	FNMA				
12) Pool Information PDI				Balance			
Coupon	1.500	WAC	2.178	Orig WAC	2.178		
		WARM	179	Orig WAM	179		
		WALA	0				
13) Collateral Information CLC				Prepay			
WAOLTV		AOLS	302,175	Orig TPO	62.17		
WAOLTV-HPI*			364,051	Curr TPO	62.17		
WAOCLTV			895,000	Green Bond	N		
WAOCS			179				
		WAODT1*	32				
14) # Loans	3,715	Delay	54 (24)	18) States	%UPB		
TRACE Eligible				*Value calculated by Bloomberg			
15) Paydown Information PDI PERF				California			
Prepay History				Texas			
Aug21				Florida			
1 Month CPR				40.5			
3 Month CPR				6.2			
6 Month CPR				4.2			
12 Month CPR							

Collateral



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P 100% FNCI 1.5 N		2.178(179)0		CUSIP 31418D4B5		Pool Level 95 Buy 96 Sell	
Summary		Comments					
Pool FN MA4417		16) Seasoning FNCI 1.5 N		As Of		08/2021	
Type (CI) UMBS Conventional Conv 15 years...		17) Vintage FNCI 1.5 2021		Issue Date		08/01/2021	
Traits 30/360				Maturity Date		08/01/2036	
1) Seller Multiple		Issuer FNMA					
12) Pool Information PDI						Balance	
Coupon 1.500		WAC 2.178		Orig WAC 2.178		Factor 1.00000000	
		WARM 179				Orig Amt 1,120,745,244	
		WALA 0				Curr Amt 1,120,745,244	
13) Collateral Information CLC						Prepay CPR PSA	
WAOLTV 55		AOLS 302,175		Orig TPO 62.17		1 Month	
WAOLTV-HPI* 55		WAOLS 364,051		Curr TPO 62.17		3 Month	
WAOCLTV 55		MAXLS 895,000		Green Bond N		6 Month	
WAOCS 772		WAOLT 179				1 Year	
		WAODTI* 32				Life	
14) # Loans 3,715		Delay 54 (24)				18) States %UPB	
		Pool info is preliminary and is subject to change				California 40.5	
TRACE Eligible						Texas 6.2	
						Florida 4.2	
15) Paydown Information PDI PERF				*Value calculated by Bloomberg			
Prepay History Aug21							
1 Month CPR							
3 Month CPR							
6 Month CPR							
12 Month CPR							

Issuance & Maturity

As Of 08/2021
Issue Date 08/01/2021
Maturity Date 08/01/2036



Description Page (DES)

FN MA4417 Mtge		Export		Page 1/2		Security Description	
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Pool	FN MA4417	16) Seasoning	FNCI 1.5 N	As Of	08/2021		
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Traits	30/360			Maturity Date	08/01/2036		
1) Seller	Multiple	Issuer	FNMA				
12) Pool Information PDI				Balance			
Coupon	1.500	WAC	2.178	Orig WAC	2.178		
		WARM	179	Orig WAM	179		
		WALA	0				
13) Collateral Information CLC				Prepay			
WAOLTV	55	AOLS	302,175	Orig TPO	62.17		
WAOLTV-HPI*	55	WAOLS	364,051	Curr TPO	62.17		
WAOCLTV	55	WALS	895,000	Green Bond	N		
WAOCS		WALS	179				
		WALS*	32				
14) # Loans	54 (24)			18) States	%UPB		
TRACE Eligible				*Value calculated by Bloomberg			
15) Paydown Information PDI PERF				California			
Prepay History	Aug21			Texas			
1 Month CPR				Florida			
3 Month CPR							
6 Month CPR							
12 Month CPR							

WAM & WALA

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Traits	30/360					Maturity Date 08/01/2036	
1) Seller Multiple		Issuer FNMA					
12) Pool Information PDI						Balance	
Coupon	1.500	WAC	2.178	Orig WAC	2.178	Factor	1.00000000
		WARM	179	Orig WAM	179	Orig Amt	1,120,745,244
		WALA	0			Curr Amt	1,120,745,244
13) Collateral Information CLC						Prepay	CPR PSA
WAOLTV	55	AOLS	5	Orig TPO	62.17	1 Month	
WAOLTV-HPI*	55	WAOLS	387,851	Curr TPO	62.17	3 Month	
WAOCLTV	55	MAXES	895,000	Green Bond	N	6 Month	
WAOCS	772	WAOLT	179			1 Year	
		WAODTI*	32			Life	
14) # Loans	3,715	Delay	54 (24)	Pool info is preliminary and is subject to change		18) States	%UPB
TRACE Eligible						California	40.5
15) Paydown Information PDI PERF				*Value calculated by Bloomberg		Texas	6.2
Prepay History		Aug21				Florida	4.2
1 Month CPR							
3 Month CPR							
6 Month CPR							
12 Month CPR							

of loans

14) # Loans 3,715



Description Page (DES)

FN MA4417 Mtge		Export		Page 1/2		Security Description				
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Type	(CI) UMBS Conventional Conv 15 years...			17) Vintage	FNCI 1.5 2021		Issue Date	08/01/2021		
Traits	30/360						Maturity Date	08/01/2036		
1) Seller	Multiple		Issuer	FNMA						
12) Pool Information PDI							Balance			
Coupon	1.500	WAC	2.178	Orig WAC	2.178		Factor	1.00000000		
		WARM	179	Orig WAM	179		Orig Amt	1,120,745,244		
		WALA	0				Curr Amt	1,120,745,244		
13) Collateral Information CLC							Prepay		CPR	PSA
WAOLTV	55	AOLS	302,175	Orig TPO			1 Month			
WAOLTV-HPI*	55	WAOLS	364,051	Curr TPO			3 Month			
WAOCLTV	55	MAXLS	895,000	Green Bond	N		6 Month			
WAOCS	772	WAOLT	179				1 Year			
		WAODTI*	32				Life			
14) # Loans	3,715	Delay	54 (24)				18) States	%UPB		
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15) Paydown Information PDI PERF							Texas	6.2		
Prepay History							Florida	4.2		
Aug21							*Value calculated by Bloomberg			
1 Month CPR										
3 Month CPR										
6 Month CPR										
12 Month CPR										

Geo

18) States	%UPB
California	40.5
Texas	6.2
Florida	4.2



Analyzing an MBS pool

- The YT screen allows the investor to analyze the performance of the MBS pool under multiple prepayment scenarios
- Also provides the investors with an overview of the collateral data and previous prepayment behavior
- Investor just needs: Price & Settlement date

Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%										
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%												
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%												
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%												
Life	--	--	--	# Loans	3,715																		
														1) Price-to-Yield									
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED													
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA													
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793													
Avg Life				4.79	6.20	6.11	5.82	2.87	1.85	1.59													
Mod Duration				4.58	5.84	5.77	5.51	2.80	1.82	1.58													
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31													
	I Spread			40	29	30	33	40	12	-5													
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85			
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+						

Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCL 1.5%												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--	C		Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%									
3Mo	--	--			21	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%											
6Mo	--	--			21	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%											
12Mo	--	--					Factor	1.0	WAOLS		NC	3%											
Life	--	--					# Loans	3,715															
1) Price-to-Yield																							
Settle	08/17/21				0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED												
Vary	0				246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA												
Price	102-05				1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793												
Avg Life					4.79	6.20	6.11	5.82	2.87	1.85	1.59												
Mod Duration					4.58	5.84	5.77	5.51	2.80	1.82	1.58												
Prin Win	Date				9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31												
I Spread					40	29	30	33	40	12	-5												
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85			
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+						

Ticker



Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table			
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021			
8/2021	P	--C	B	Traits		1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	CA	40%	2021	100%							
3Mo	--	--				1.1MMM	MAXLS	895,000	Next Pay	9/25/21	TX	6%									
6Mo	--	--				1.0	WAOLS	364,051			FL	4%									
12Mo	--	--				3,715					NC	3%									
Life	--	--																			
1) Price-to-Yield																					
Settle	08/17/21		0 MED		+300 MED		+200 MED		+100 MED		-100 MED		-200 MED		-300 MED						
Vary	0		246 PSA		110 PSA		117 PSA		141 PSA		640 PSA		1270 PSA		1589 PSA						
Price	102-05		1.0140		1.1204		1.1151		1.0967		0.7023		0.2728		0.0793						
Avg Life			4.79		6.20		6.11		5.82		2.87		1.85		1.59						
Mod Duration			4.58		5.84		5.77		5.51		2.80		1.82		1.58						
Prin Win	Date		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-8/31						
I Spread			40		29		30		33		40		12		-5						
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y	
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85	
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+				

CUSIP Number



Yield Table (YT)

FN MA4417 Mtge												Yield Table								
P 100% FNCI 1.5 N												As of 08/2021								
8/2021	P	--C	B	2.178(179)0	CUSIP	3141804R5	Pool Level	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%					
3Mo	--	--	--	08/1/2021	1.1MMM		55/55	Accrual	8/1-8/31	TX	6%									
6Mo	--	--	--	08/1/2021	1.1MMM			MAXLS	895,000	Next Pay	9/25/21	FL	4%							
12Mo	--	--	--		1.0			WAOLS	364,051			NC	3%							
Life	--	--	--		2.715															
1) Price-to-Yield																				
Settle	08/17/21			WAC (WAM) WALA		+200 MED	+100 MED	-100 MED	-200 MED	-300 MED										
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA										
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793										
Avg Life				4.79	6.20	6.11	5.82	2.87	1.85	1.59										
Mod Duration				4.58	5.84	5.77	5.51	2.80	1.82	1.58										
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31										
	I Spread			40	29	30	33	40	12	-5										
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+			

Yield Table (YT)

FN MA4417 Mtge		Actions	Export	Settings	Yield Table					
P 100% FNCI 1.5 N		2.178(179)0		CUSIP 31418D4B5	Pool Level	As of 08/2021				
8/2021	P --C B	Traits	CT 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40% 2021 100%	
3Mo	-- -- --	08/01/2021	1.1MMM	LTV/HLTV	55/55	08/1/21	08/1/21	TX	6%	
6Mo	-- -- --	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%	
12Mo	-- -- --	Factor	1.0	WAOLS	364,051			NC	3%	
Life	-- -- --	# Loans	3,715							
1) Price-to-Yield										
Settle	08/17/21		+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED		
Vary	0	246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA		
Price	102-05	1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793		
Avg Life		4.79	6.20	6.11	5.82	2.87	1.85	1.59		
Mod Duration		4.58	5.84	5.77	5.51	2.80	1.82	1.58		
Prin Win	Date	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31		
	I Spread	40	29	30	33	40	12	-5		
Aug21	Jul Jun May Apr Mar Feb Jan Dec Nov Oct Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y
--P	-- -- -- -- -- -- -- -- -- -- --	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85
--C	-- -- -- -- -- -- -- -- -- -- --	Disc 30/360	3Y	100-05	5Y	99-28+				

Issue & Maturity



Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%										
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%												
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%												
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%												
Life	--	--	--	# Loans	3,715																		
Price-to-Yield																							
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED													
Vary	0	246	SA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA														
Price	102-			1.1204	1.1151	1.0967	0.7023	0.2728	0.0793														
Avg Life				4.79	6.20	6.11	5.82	2.87	1.85	1.59													
Mod Duration				4.58	5.84	5.77	5.51	2.80	1.82	1.58													
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31													
	I Spread			40	29	30	33	40	12	-5													
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85			
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+						

Total Loans in the Pool



Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table			
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021			
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%								
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%										
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%										
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%										
Life	--	--	--	# Loans	3,715																
1) Price-to-Yield																					
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	00 MED				-300 MED								
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640		1270 PSA			1589 PSA								
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023		0.2728			0.0793								
Avg Life				4.79	6.20	6.11	5.82	2.87		1.85			1.59								
Mod Duration				4.58	5.84	5.77	5.51	2.80		1.82			1.58								
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36		9/21-8/31								
	I Spread			40	29	30	33	40		12			-5								
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y	
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85	
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+				

Breakdown of loans

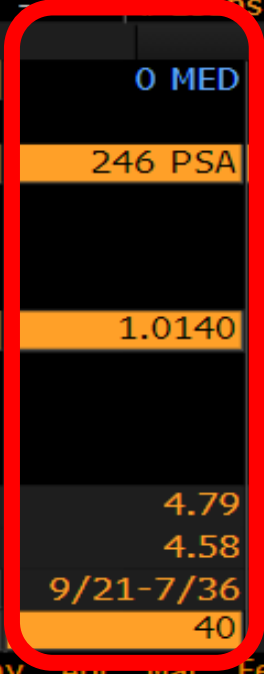
Analyzing an MBS pool - WAL

- Since the MBS pool pays down each month, investors evaluate MBS on an average life basis
- Because of the nature of MBS, the stated (final) maturity of the MBS will most likely not be its true life
- Average life is calculated as the weighted average time to principal payment, with the individual loan balances creating the weights

Yield Table (YT)

FN MA4417 Mtge		Actions	Export	Settings	Yield Table															
P 100% FNCI 1.5 N		2.178(179)0		CUSIP 31418D4B5	Pool Level	As of 08/2021														
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%							
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%									
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%									
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%									
Life	--	--	--	Months	3,715															
Settle	08/17/21			0 MED	+300 MED					-100 MED	-200 MED	-300 MED								
Vary	0			246 PSA	110 PSA					640 PSA	1270 PSA	1589 PSA								
Price	102-05			1.0140	1.1204	1.1151	1.0967			0.7023	0.2728	0.0793								
Avg Life				4.79	6.20	6.11	5.82			2.87	1.85	1.59								
Mod Duration				4.58	5.84	5.77	5.51			2.80	1.82	1.58								
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36			9/21-7/36	9/21-7/36	9/21-8/31								
	I Spread			40	29	30	33			40	12	-5								
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+			

Yield & WAL of bond at base case speed



Analyzing an MBS pool - WAL

- Different prepayments speeds create different WALs
- The slower the loans in the pool pre-pay (lower CPR and PSA speeds), the longer it will take for the bond to paydown, therefore the longer the WAL (the bond extends)
- Conversely, the faster the loans prepay (higher CPR and PSA speeds), the faster the bond will pay off, the shorter the WAL (the bond shortens)

WAL at base case

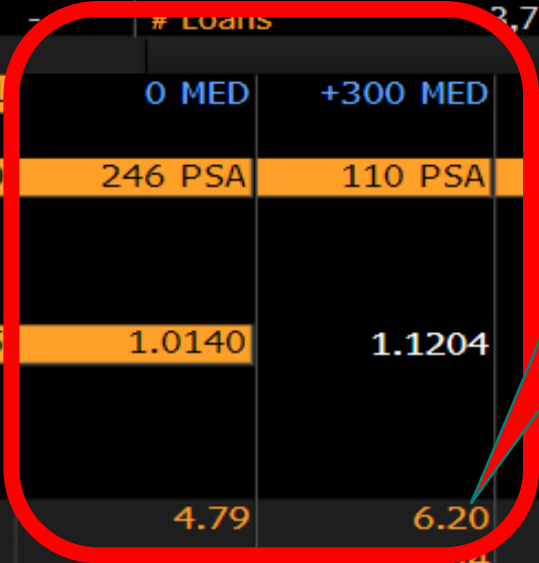
FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%										
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%												
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%												
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%												
Life	--	--	--	Months	3,715																		
1) Price-to-Yield																							
Settle	08/17/21		0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED														
Vary	0		246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA														
Price	102-05		1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793														
Avg Life			4.79	6.20	6.11	5.82	2.87	1.85	1.59														
Mod Duration			4.58	5.84	5.77	5.51	2.80	1.82	1.58														
Prin Win	Date		9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31														
	I Spread		40	29	30	33	40	12	-5														
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M 1Y 2Y 3Y 5Y 7Y 10Y 30Y										
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05 0.06 0.17 0.32 0.65 0.94 1.17 1.85										
--C	--	--	--	--	--	--	--	--	--	--	--	Disc 30/360	3Y 100-05 5Y 99-28+										

Base case yield & speed

WAL at slower speeds

FN MA4417 Mtge		Actions	Export	Settings	Yield Table						
P 100% FNCI 1.5 N		2.178(179)0 CUSIP 31418D4B5 Pool Level			As of 08/2021						
8/2021	P --C B	Traits	CI, 30/360		36	CA	40%	2021	100%		
3Mo	-- -- --	08/01/2021	1.1MMM		31	TX	6%				
6Mo	-- -- --	08/25/2021	1.1MMM		21	FL	4%				
12Mo	-- -- --	Factor	1.0	WAOLS		NC	3%				
Life	-- -- --	# Loans	2,715								
Settle	08/17/21	0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED			
Vary	0	246 PSA	110 PSA	170 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA			
Price	102-05	1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793			
Avg Life		4.79	6.20	6.11	5.82	2.87	1.85	1.59			
Mod Duration		1.58	3.84	5.77	5.51	2.80	1.82	1.58			
Prin Win	Date	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31			
	I Spread	40	29	30	33	40	12	-5			
Aug21	Jul Jun May Apr Mar Feb Jan Dec Nov Oct Sep	GOVT(I)		6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y
--P	-- -- -- -- -- -- -- -- -- -- --	16:22		0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85
--C	-- -- -- -- -- -- -- -- -- -- --	Disc 30/360		3Y	100-05	5Y	99-28+				

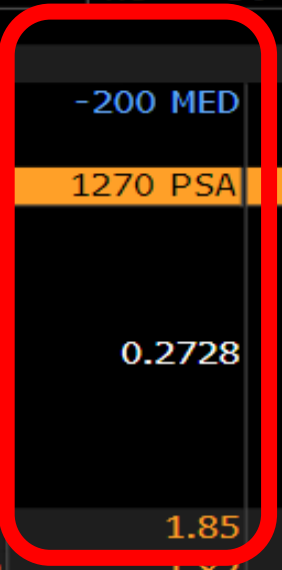
Slower prepayment speed, longer WAL



WAL at faster speeds

FN MA4417 Mtge										Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N										2.178(179)0		CUSIP 3141		As of 08/2021							
8/2021	P	--C	B	Traits	CI, 30/360																
3Mo	--	--	--	08/01/2021	1.1MM																
6Mo	--	--	--	08/25/2021	1.1MM																
12Mo	--	--	--	Factor	1.0	WAOLS	364,051														
Life	--	--	--	# Loans	3,715																
1) Price-to-Yield																					
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED											
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA											
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793											
Avg Life				4.79	6.20	6.11	5.82	2.87	1.85	1.59											
Mod Duration				4.58	5.84	5.77	5.51	2.80	1.82	1.58											
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31											
	I Spread			40	29	30	33	40	12	-5											
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y	
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85	
--C	--	--	--	--	--	--	--	--	--	--	--	Disc 30/360	3Y	100-05	5Y	99-28+					

Faster prepayment speed, shorter WAL



Analyzing an MBS pool - WAL

- Investors enter in extreme prepayment speeds to see the out limits of the WAL
 - A 0 PSA/CPR assumes no prepayments
 - Will give you the longest WAL
 - A very high speed give the investor an idea of how short the bond could be
- The speeds also impact the yield

Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%										
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%												
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%												
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%												
Life	--	--	--	# Loans	3,715																		
1) Price-to-Yield																							
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED													
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA													
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793													
Avg Life				4.79	6.20	6.11	5.82	2.87	1.85	1.59													
Mod Duration				4.58	5.84	5.77	5.51	2.80	1.82	1.58													
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31													
I Spread				40	29	30	33	40	12	-5													
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85			
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+						

Why the premium price?

- The price will depend on the coupon and the current rate environment
- With a bond whose coupon is greater than current market rates, then the buyer will have to pay a premium price so the yield matches the current environment
- If the coupon is lower than the current rate environment, the buyer will demand to pay a discount price to compensate

Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%										
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%												
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%												
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%												
Life	--	--	--	# Loans	3,715																		
1) Price-to-Yield																							
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED													
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA													
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793													
Avg Life				4.79	6.20	6.11	5.82	2.87	1.81	1.59													
Mod Duration				4.58	5.84	5.77	5.51	2.80	1.82	1.58													
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31													
I Spread				40	29	30	33	40	12	-5													
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85			
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+						

Impact of premium price

- Why is the yield almost 0%?
 - Proper accounting methods require the investor to write-down premium each month
 - If prepayments come in faster than projected, the investor will have to write-down the premium quicker than projected, therefore impacting their income for the month, and the yield

Focus on Cashflows

- MBS are also known as “pass-throughs”, meaning they have a built-in ladder of cash flows
- The investor needs to analyze the collateral specs of the pool to make an estimate of the cash flows
- Investors look at the CFG function on Bloomberg to get an estimate of expected cashflows under different prepayment speeds

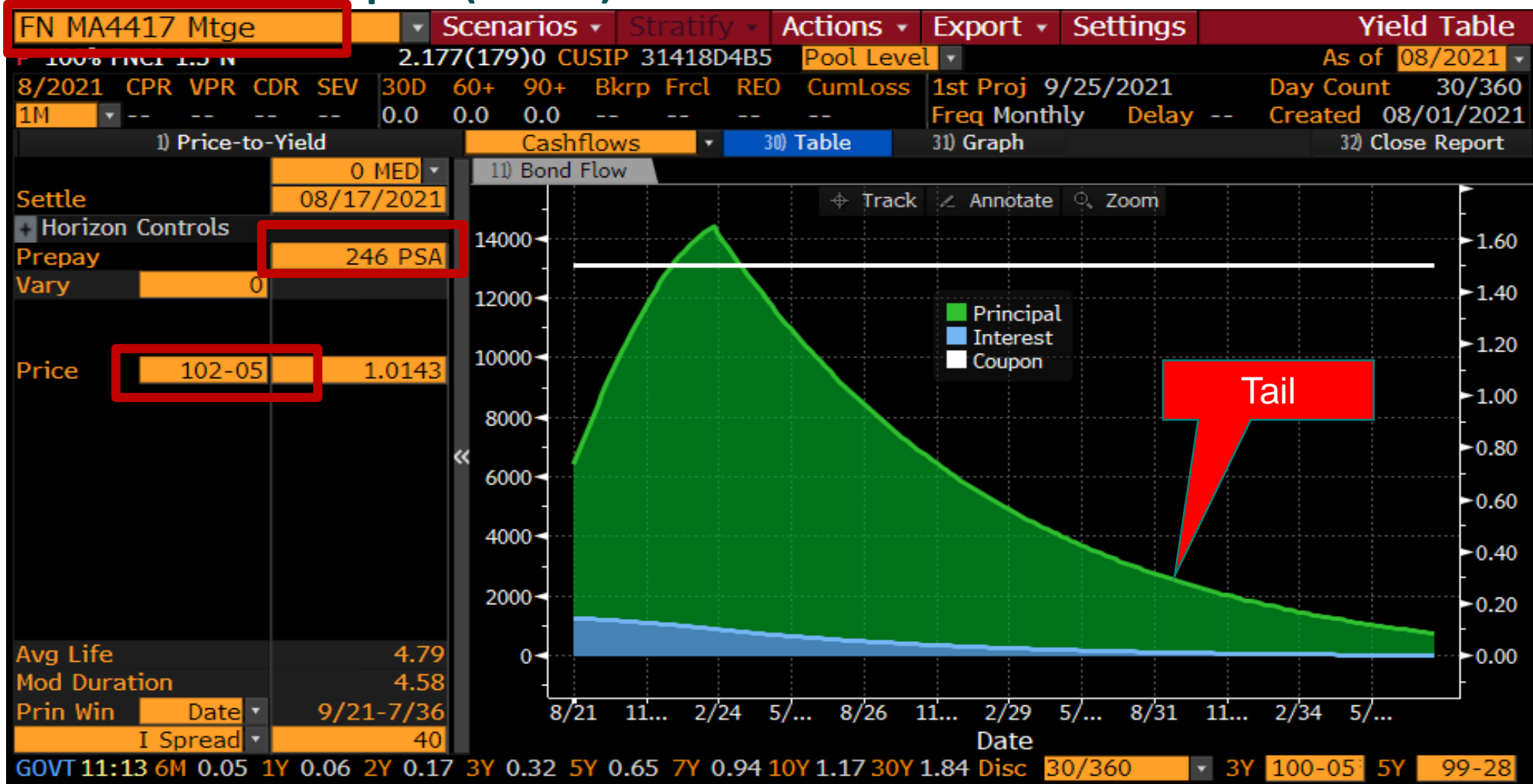
Yield Table (YT)

FN MA4417 Mtge		Actions	Export	Settings	Yield Table															
P 100% FNCI 1.5 N		2.178(179)0		CUSIP 31418D4B5	Pool Level	As of 08/2021														
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%							
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%									
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%									
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%									
Life	--	--	--	Months	3,715															
1) Price-to-Yield																				
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED										
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA										
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793										
Avg Life				4.79	6.20	6.11	5.82	2.87	1.85	1.59										
Mod Duration				1.58	5.84	5.77	5.51	2.80	1.82	1.58										
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31										
	I Spread			40	29	30	33	40	12	-5										
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+			

Base case yield & speed



Cashflow Graph (CFG)



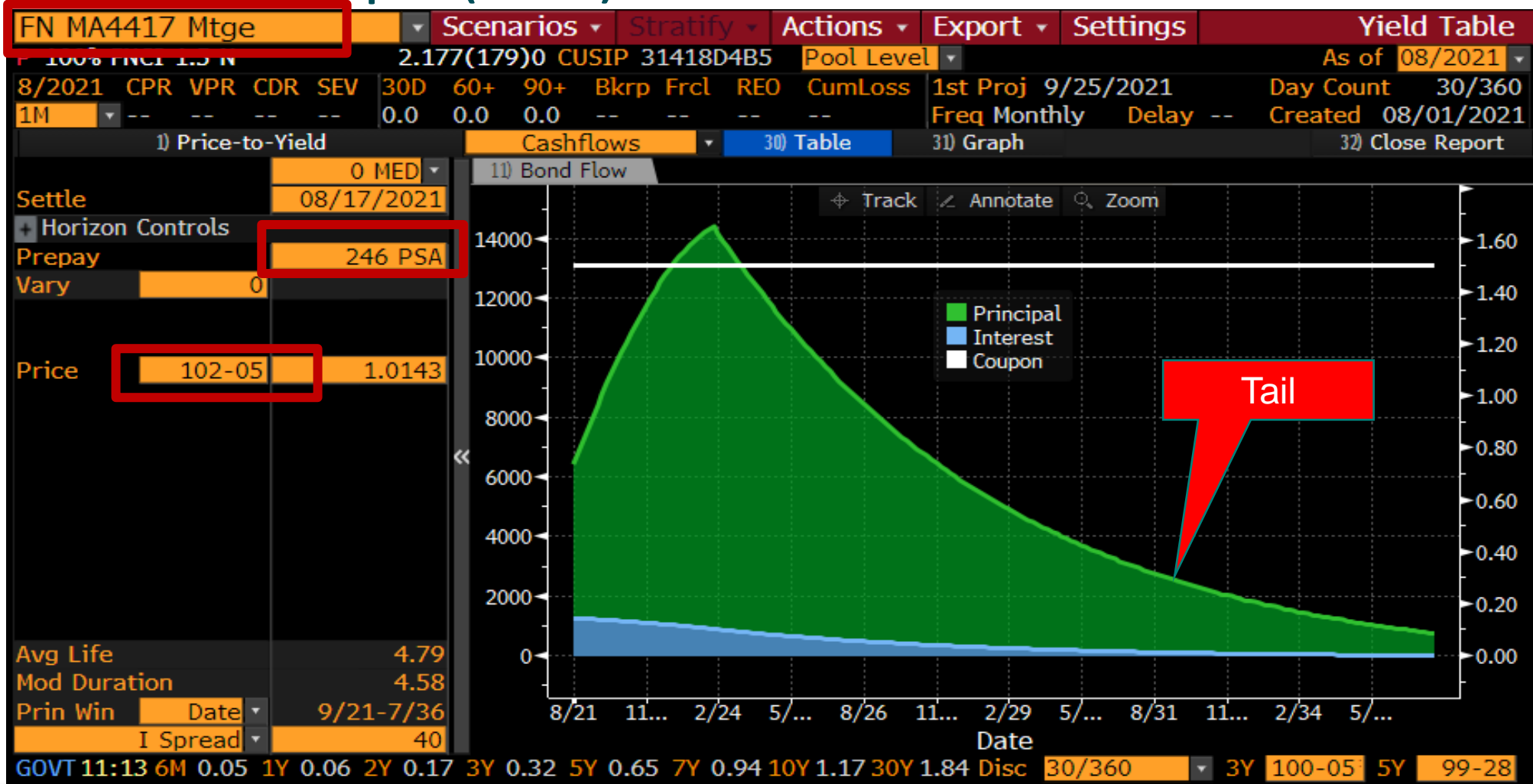
Analyzing cashflows

- Investors will want to focus on a variety of prepay speeds to determine the degree of “shortening” or “extension” of cashflows
- Both of these scenarios could be a risk

Contraction risk

- Contraction risk is the risk of the loans in the pool prepaying faster than expected at purchase
- This means more cashflows back to the investor each month
- This usually happens in a falling rate environment as homeowners have a higher propensity to re-fi/prepay their mortgage

Cashflow Graph (CFG)

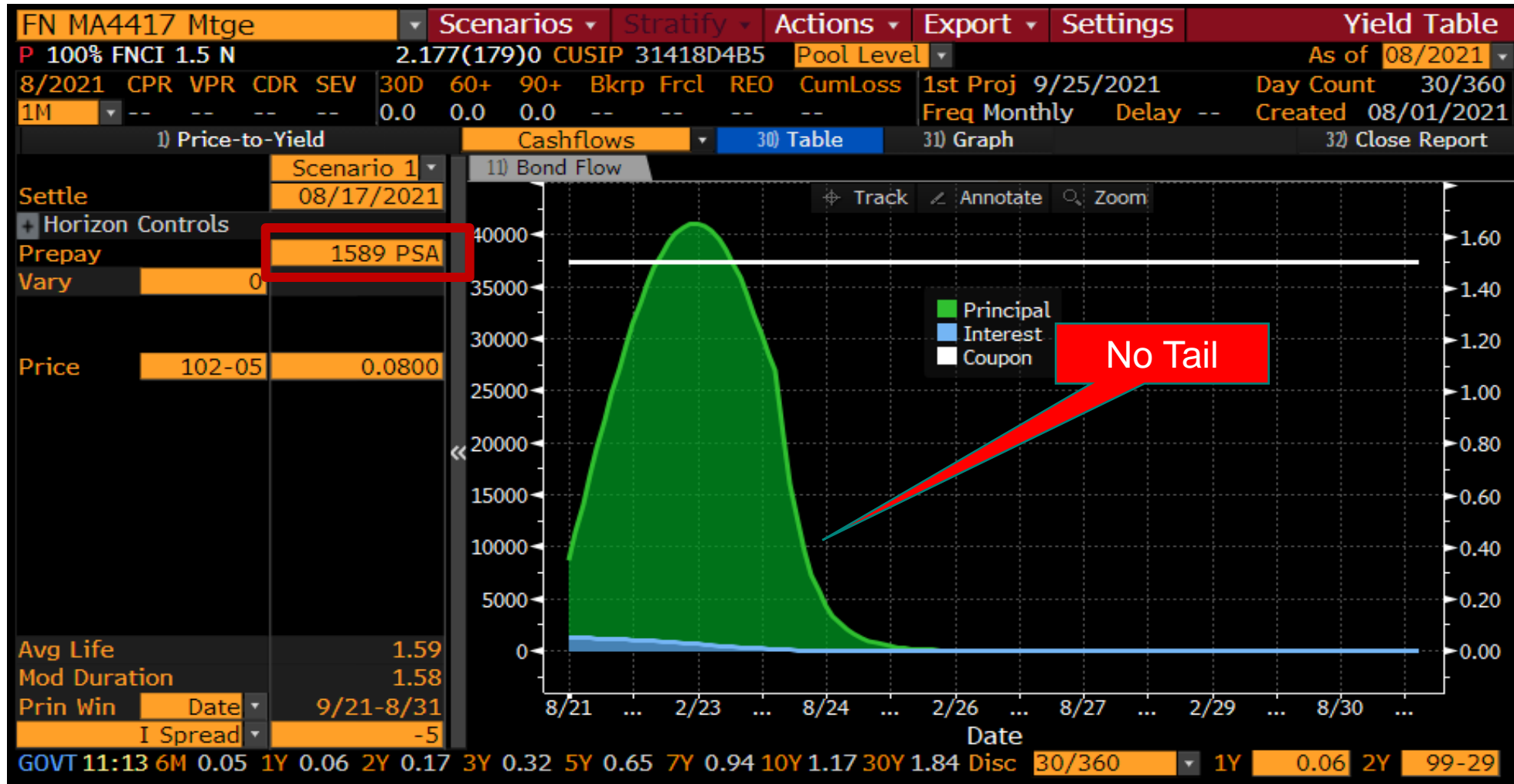


Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--	C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity														
3Mo	--	--	--		08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual														
6Mo	--	--	--		08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%											
12Mo	--	--	--		Factor	1.0	WAOLS	364,051			NC	3%											
Life	--	--	--		# Loans	3,715																	
1) Price-to-Yield																							
Settle	08/17/21		0 MED		+300 MED		+200 MED		+100 MED		-100 MED		-200 MED		-300 MED								
Vary	0		246 PSA		110 PSA		117 PSA		141 PSA		640 PSA		1270 PSA		1589 PSA								
Price	102-05		1.0140		1.1204		1.1151		1.0967		0.7023		0.2728		0.0793								
Avg Life			4.79		6.20		6.11		5.82		2.87		1.85		1.59								
Mod Duration			4.58		5.84		5.77		5.51		2.80		1.82		1.58								
Prin Win	Date		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-8/31								
	I Spread		40		29		30		33		40		12		-5								
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85			
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+						

Much faster prepayment speed

Contraction Risk



Contraction risk

- Problem for the investor:
 - Cashflows are back to the investor sooner, earlier than modeled at time of purchase
 - If the investor paid a premium to purchase the bond, the premium will need to be recognized quicker, potentially creating a possible negative yield on the investment

Contraction risk

- Problem for the investor:
 - Higher cashflows back to the investor may need to be re-invested in a lower rate environment

Extension risk

- Extension risk is the risk of the loans in the pool prepaying slower than expected at purchase
- This means less cashflows back to the investor each month
- This usually happens in a rising rate environment as homeowners have a lower propensity to re-fi/prepay their mortgage

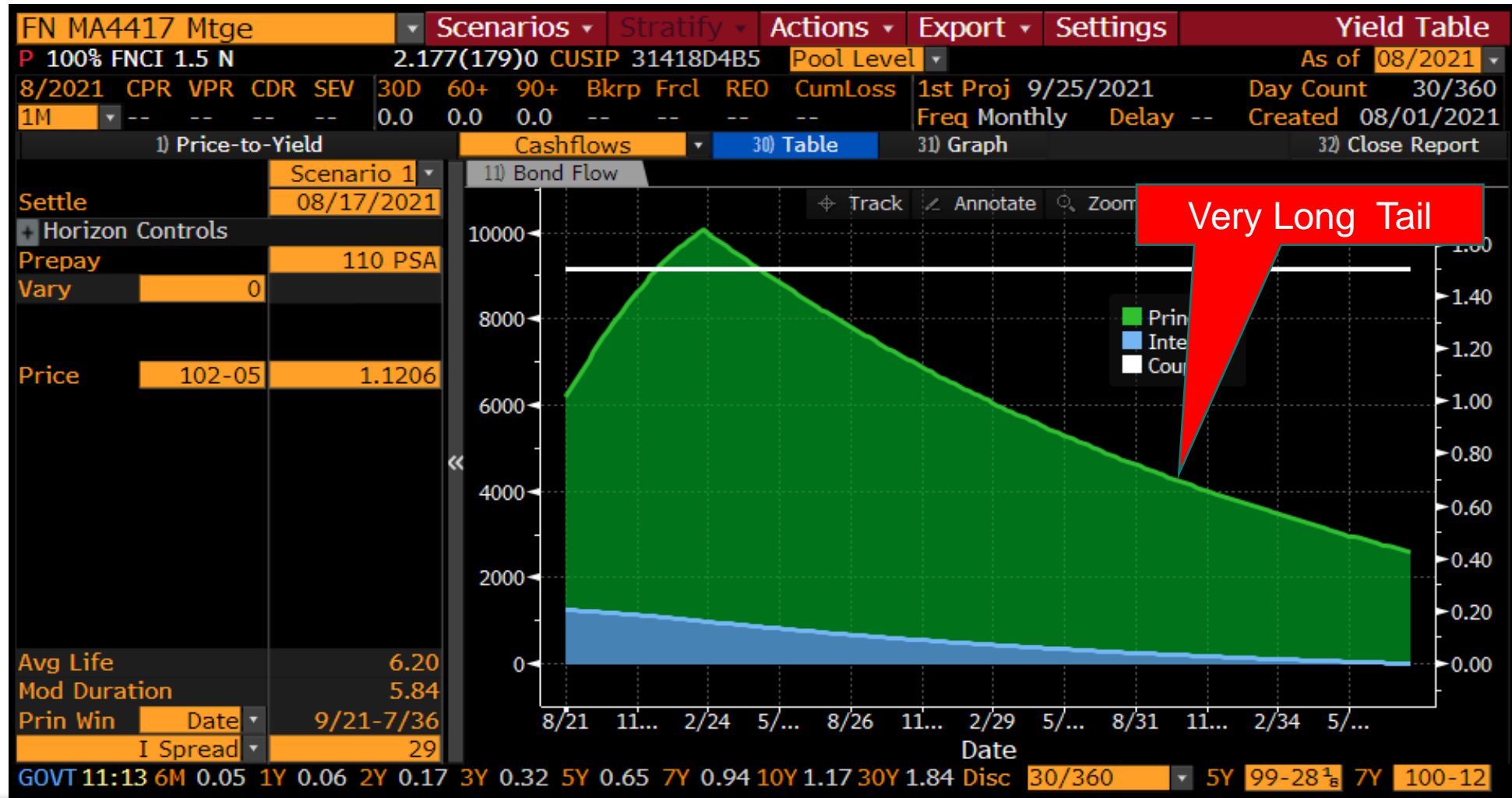
Yield Table (YT)

FN MA4417 Mtge												Actions		Export		Settings		Yield Table					
P 100% FNCI 1.5 N												2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021					
8/2021	P	--C				08/25/2021		1.5% Maturity		8/1/36		CA		40% 2021		100%							
3Mo	--	--				Factor		55/55 Accrual		8/1-8/31		TX		6%									
6Mo	--	--				# Loans		895,000		Next Pay		9/25/21		FL		4%							
12Mo	--	--						364,051				NC		3%									
Life	--	--																					
												1) Price-to-Yield											
Settle	08/17/21		0 MED		+300 MED		+200 MED		+100 MED		-100 MED		-200 MED		-300 MED								
Vary	0		246 PSA		110 PSA		117 PSA		141 PSA		640 PSA		1270 PSA		1589 PSA								
Price	102-05		1.0140		1.1204		1.1151		1.0967		0.7023		0.2728		0.0793								
Avg Life			4.79		6.20		6.11		5.82		2.87		1.85		1.59								
Mod Duration			4.58		5.84		5.77		5.51		2.80		1.82		1.58								
Prin Win	Date		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-7/36		9/21-8/31								
I Spread			40		29		30		33		40		12		-5								
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85			
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+						

Much slower prepayment speed

110 PSA

Extension Risk



Extension risk

- Problem for the investor:
 - Lower cashflows back to the investor means less cashflow to re-invest at higher rates or to fund loan demand or withdrawal activity
 - If investor bought at a premium, the premium can be written down at a slower pace, therefore enhancing yield

Analyzing an MBS

- The investor should request the following Bloomberg screens when purchasing an MBS:
 - **DES:** Description of the bond
 - **YT:** Yield Table/Analysis
 - **CFG:** Cashflow analysis
 - **CLC:** Collateral analysis (3-6 pages)
 - **OAS1:** Option adjusted spread analysis
 - **TRA:** Total return analysis

Collateral Description (CLC)

FN MA4417 Mtge		Collateral Composition				
P 100% FNCI 1.5 N		2.177(179)0 CUSIP 31418D4B5		Pool Level ▾		
Composition		Overview <input type="checkbox"/> Show All <input type="checkbox"/> 33) Clear		34) Group 0 Loans		
		As of 08/2021 ▾				
1) Overview		Curr %	Issue %	Curr %	Issue %	
2) Addl Info 1		08/2021	08/2021	08/2021	08/2021	
3) Modification		Loan Purpose	Occupancy			
4) Custom		Refinance	Owner Occupied	96.6	96.6	
5) Quartiles		Equity Take Out	Vacation	3.0	3.0	
Distribution		Property Type	Borrowers			
6) Origination Year		Single Family	1 Borrower	52.5	52.5	
7) Geographics		Planned Unit Development	2 Borrowers	47.2	47.2	
8) Servicers		First Time Home Buyer	Mortgage Insurance			
9) Sellers		NO	No Data	97.6	97.6	
10) Coupon		Vintage	Issuer Agency			
11) Issuance LTV		2021	FNM	100.0	100.0	
12) Amortized LTV		100.0	100.0			
13) Combined LTV		100.0	100.0			
14) Original LTV		100.0	100.0			
15) Credit Score		100.0	100.0			
16) Debt to Income		100.0	100.0			
17) Orig Loan Size		100.0	100.0			
18) Age		100.0	100.0			
19) Remaining Term		100.0	100.0			
20) Original Term		100.0	100.0			
21) Next Step Date		100.0	100.0			
22) Last Step Date		100.0	100.0			
23) Terminal Coupon		100.0	100.0			
		QUICKEN LOANS, LLC	California	40.7	40.7	
		UNITED WHOLESALE MORTGAGE,...	Texas	6.3	6.3	
		LOANDEPOT.COM, LLC	Florida	4.1	4.1	
		LOANDEPOT.COM, LLC	North Carolina	3.3	3.3	
		QUICKEN LOANS, LLC	Michigan	3.3	3.3	
		UNITED WHOLESALE MORTGAGE,...	New Jersey	3.2	3.2	
		LOANDEPOT.COM, LLC	Maryland	3.2	3.2	
		LOANDEPOT.COM, LLC	Washington	3.2	3.2	
		LOANDEPOT.COM, LLC	Virginia	2.9	2.9	
		LOANDEPOT.COM, LLC	Georgia	2.6	2.6	
		LOANDEPOT.COM, LLC	Colorado	2.5	2.5	

Analyzing an MBS

- The investor should also develop a commentary section discussing the thought process/strategy behind buying the bond and why it fits into the portfolio
- If possible, wouldn't hurt to run the bond through an ALM model to see changes in NII and NEV under a variety of scenarios
- If buying a group of bonds, should have these modeled in an ALM model prior to purchase

Choosing the right MBS for your portfolio

Choosing the right MBS

- MBS pools come in maturities similar to mortgage loan offerings of:
 - 30yr
 - 20yr
 - 15yr
 - 10yr
- For most CUs, the most appropriate pools are 10 & 15yr MBS

Choosing the right MBS

- Investor needs to determine the structure that would fit best on the balance, not the highest yielding MBS
- Compare bonds and parameters
- Look at WAL, yield, cashflow projections and price sensitivity that best fit

Choosing the right MBS

- Investors need to look at areas already discussed to determine the cashflow profile of the MBS
 - Coupon, final maturity, and expected prepayment behavior
 - Thorough analysis of the collateral will help investor develop an estimate for prepayments

15-yr MBS

FN MA4417 Mtge										Actions		Export		Settings		Yield Table				
P 100% FNCI 1.5 N										2.178(179)0		CUSIP 31418D4B5		Pool Level		As of 08/2021				
8/2021	P	--C	B	Traits	CI, 30/360	Coupon	1.5%	Maturity	8/1/36	CA	40%	2021	100%							
3Mo	--	--	--	08/01/2021	1.1MMM	LTV/HLTV	55/55	Accrual	8/1-8/31	TX	6%									
6Mo	--	--	--	08/25/2021	1.1MMM	MAXLS	895,000	Next Pay	9/25/21	FL	4%									
12Mo	--	--	--	Factor	1.0	WAOLS	364,051			NC	3%									
Life	--	--	--	# Loans	3,715															
														1) Price-to-Yield						
Settle	08/17/21			0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED										
Vary	0			246 PSA	110 PSA	117 PSA	141 PSA	640 PSA	1270 PSA	1589 PSA										
Price	102-05			1.0140	1.1204	1.1151	1.0967	0.7023	0.2728	0.0793										
Avg Life				4.79	6.20	6.11	5.82	2.87	1.85	1.59										
Mod Duration				4.58	5.84	5.77	5.51	2.80	1.82	1.58										
Prin Win	Date			9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-7/36	9/21-8/31										
	I Spread			40	29	30	33	40	12	-5										
Aug21	Jul	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y
--P	--	--	--	--	--	--	--	--	--	--	--	16:22	0.05	0.06	0.17	0.32	0.65	0.94	1.17	1.85
--C	--	--	--	--	--	--	--	--	--	--	--	Disc	30/360	3Y	100-05	5Y	99-28+			

10-yr MBS

FN MA4409 Mtge		Actions	Export	Settings	Yield Table							
100% FNCN 1.5 N		2.199(118)0		CUSIP 31418D3T7	Pool Level	As of 07/2021						
7/2021	P	--C	B	Traits	CN, 30/360	Coupon	1.5%	Maturity	8/1/31	CA	20% 2021	100%
3Mo	--	--	--	07/01/2021	990,912,200	LTV/HLTV	47/47	Accrual	8/1-8/31	TX	7% 2020	0%
6Mo	--	--	--	07/25/2021	990,912,200	MAXLS	822,000	Next Pay	9/25/21	NJ	5%	
12Mo	--	--	--	Factor	1.0	WAOLS	264,094			MI	4%	
Life	--	--	--	# Loans	4,745							
1) Price-to-Yield												
Settle	08/17/21	0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED				
Vary	0	422 PSA	227 PSA	251 PSA	303 PSA	726 PSA	1088 PSA	1182 PSA				
Price	102-28 ⁷ / ₈	0.5183	0.7003	0.6784	0.6303	0.2288	-0.1029	-0.1857				
Avg Life		3.09	3.82	3.71	3.50	2.37	1.87	1.78				
Mod Duration		3.03	3.71	3.61	3.41	2.34	1.86	1.77				
Prin Win	Date	9/21-5/31	9/21-5/31	9/21-5/31	9/21-5/31	9/21-5/31	9/21-5/31	9/21-5/31				
	I Spread	18	24	24	22	0	-26	-33				
Jul21	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	Aug	GOVT(I)
--P	--	--	--	--	--	--	--	--	--	--	--	12:02
--C	--	--	--	--	--	--	--	--	--	--	--	Disc 30/360
												3Y 100-05
												5Y 99-28 ¹ / ₄

Choosing the right MBS

- Some strategies include:
 - Investor buys high coupon MBS if rates are moving higher
 - Means higher dollar price (premium bond)
 - Higher rates could mean slower prepayments, and therefore better yield and better protection for writing down premium (slower prepays)

Choosing the right MBS

- Some strategies include:
 - Investor buys low coupon MBS with shorter final (10yr MBS) if rates are low and may remain flat or moving higher
 - Means lower dollar price (less premium risk)
 - Prepayment will be slow, so higher rates or slightly lower rate won't impact prepayments as much
 - Limits extension and contraction risk

Choosing the right MBS

- Some strategies include:
 - Investor buys seasoned MBS pools (longer loan age), low coupon MBS with shorter final (10yr MBS) if rates are low and may remain flat or moving higher
 - Means higher dollar price (premium risk)

Seasoned 15-yr MBS

EN EM1155 Mtge												Actions		Export		Settings		Yield Table					
100% FNCI 2.5 S												2.973(109)65		CUSIP 3140X4H90		Pool Level		As of 07/2021					
7/2021	421P	25.2C	0.1B	Traits	CI, Super, 30/360	Coupon	2.5%	Maturity	6/1/32	CA	15%	2017	4%										
3Mo	406	24.3	0.1	06/01/2019	635,135,165	LTV/HLTV	64/49	Accrual	8/1-8/31	TX	7%	2016	58%										
6Mo	417	25.0	0.1	07/25/2021	351,695,821	MAXLS	939,000	Next Pay	9/25/21	NY	6%	2015	31%										
12Mo	403	24.2	0.1	Factor	0.55373382	WAOLS	272,196			IL	5%	2013	3%										
Life	301	18.0	--	# Loans	272,545																		
1) Price-to-Yield																							
Settle	08/17/21		0 MED	+300 MED	+200 MED	+100 MED	-100 MED	-200 MED	-300 MED														
Vary	0		281 PSA	186 PSA	196 PSA	232 PSA	392 PSA	500 PSA	539 PSA														
Price	105-10		0.6055	0.8705	0.8440	0.7459	0.2564	-0.1269	-0.2767														
Avg Life			2.93	3.44	3.38	3.18	2.45	2.08	1.96														
Mod Duration			2.80	3.31	3.26	3.08	2.42	2.08	1.97														
Prin Win	Date	9/21-8/30		9/21-8/30	9/21-8/30	9/21-8/30	9/21-8/30	9/21-8/30	9/21-8/30														
	I Spread	29		47	46	39	1	-31	-45														
Jul21	Jun	May	Apr	Mar	Feb	Jan	Dec	Nov	Oct	Sep	Aug	GOVT(I)	6M	1Y	2Y	3Y	5Y	7Y	10Y	30Y			
421P	389	407	486	405	395	428	356	398	393	430	322	12:06	0.05	0.06	0.17	0.32	0.65	0.95	1.17	1.84			
25.2C	23.3	24.4	29.2	24.3	23.7	25.7	21.4	23.9	23.6	25.8	19.3	Disc	30/360	2Y	99-29	3Y	100-05						

Choosing the right MBS

- 10yr MBS are a great fit as they have shorter maturities and WALs & has limited extension risk given the short final maturity
- 10yr mortgages are typically held by homeowners as a financial planning tool as they typically have decent equity in their home
 - Prepayments are typically low, especially in lower coupon MBS

Choosing the right MBS

- 15yr MBS are also a nice fit for most portfolios, but do have a longer final maturity and WAL, which may not fit in some CU investment policies
- Allows investors to move out slightly longer on the yield curve to pick up additional yield
 - Compliments holding in the 10yr MBS
- Usually more supply and better prepayment history

Choosing the right MBS

- 20yr & 30yr MBS offer better yields, but also longer WALs and much more extension risk
- Better supply here as well, but a much longer asset
- If a CU doesn't like to add 20yr or 30yr mortgages to their balance sheet, they probably shouldn't add these MBS pools to their investment portfolio

Choosing the right MBS

- Choosing the right coupon is also a consideration
- Depends on the strategy of the investor and their projection for rates going forward
- In general, the higher the coupon, the shorter the WAL
 - Depending on the current interest rate environment, it also may mean a much higher price

Investing in MBS - Considerations

- Policy allowable
- Investment accounting of premium/discount price and of amortization
- Comfortable with structures
- Safekeeping/brokers
- Market values

Policy language for MBS

- If the choice is to add MBS to the portfolio, certain items need to be detailed in the Investment & ALM policy
- Investor need to determine what will be allowable, and develop the proper limits
- Also needs to detailed analysis that will be completed

Policy language for MBS

- The Credit Union may invest in a variety of agency MBS structures issued by GNMA, FNMA, and/or FHLMC
- Establish limits:
 - MBS purchase limit of \$X per investment
 - Aggregate limit for entire MBS portfolio will be a certain of the investment portfolio or capital
 - Establish maximum term, stated in weighted average life at issuance in a “up 300 basis point” assumption, is seven (7) years (Bloomberg consensus)

Investments Strategy

- Maximize earnings on short-term cash needed for daily operations and short-term liquidity needs
- Create a barbell in order to ensure liquidity and income
 - Longer Jumbo CD's – VFCCU and SimpliCD Specials 3+ years
 - Callables – Focus on 3-5 years
 - New 10yr, 15yr, 20yr MBS
 - Nice yields compared to other options but premiums
 - Monthly cash-flows

Investments Strategy

- Work with folks you know and trust
- Need to open a brokerage account
- Need to open a safekeeping account
 - Vizo Financial has brokerage services and safekeeping services
- Staff can provide education and training for staff and board