

# MORTGAGE STRATEGY

## Monthly Report

### RISK MANAGEMENT WITH HYBRID ARMs

**P. 2**

With the market consensus starting to move toward the next move in the Fed Funds rate being a cut (albeit tentatively and in the somewhat-distant future), it is time to begin to consider STEEPENING strategies. One sector that provides a steepening bias for the portfolio is also historically cheap vs. short-duration alternatives: low-WALA agency hybrid ARMs.

*Walt Schmidt*

### MORTGAGE STRATEGIES

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### MARKET UPDATE

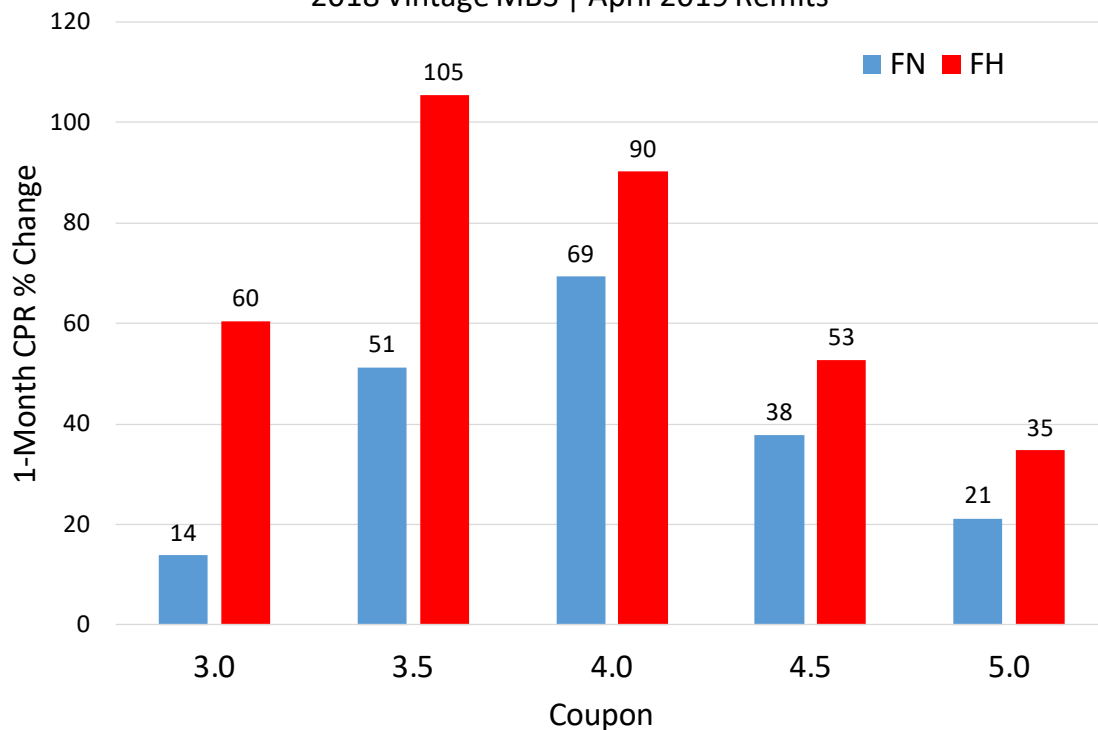
**P. 8**

Month-to-date, conventional 30yr production coupon MBS has outperformed UST and swap hedge ratios despite underperforming last week. 2-4yr CMO spreads are 0-3bps wider since April. Hybrid spreads are 4bps wider while CMO Floater DMs are unchanged. The payups for loan balance specified pools 3.0s-5.0s increased 2-11 ticks since the end of last month. 100% NY payups also increased, by 2-6 ticks in 3.5s-4.5s. Fixed prepayment speeds increased substantially in April by over 24% due to lower primary rates during the refi window, higher turnover, and one additional business day.

*Alexis Vilimas*

## The Change Matters as Much as the Level

1-Month CPR Percent Change by Coupon  
2018 Vintage MBS | April 2019 Remits



Source: FTN Financial and CPRCDR

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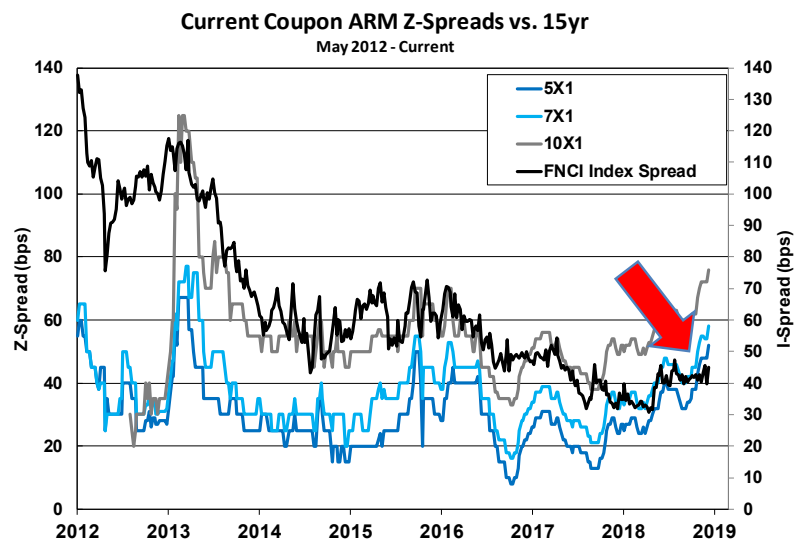
**Executive Summary:** With the market consensus starting to move toward the next move in the Fed Funds rate being a cut (albeit tentatively and in the somewhat-distant future), it is time to begin to consider STEEPENING strategies. One sector that provides a steepening bias for the portfolio is also historically cheap vs. short-duration alternatives: low-WALA agency hybrid ARMs.

Low-WALA hybrid ARMs currently occupy a unique position relative to short-duration alternatives such as CMOs and benchmark 15yr passthru. Largely due to the flat yield curve, they are prepaying faster, which is giving the sector both a much shorter duration profile AND a cheaper nominal spread profile.

In fact, low-WALA 5X1 and 7X1 hybrid ARMs are now trading cheap vs. same-coupon 15yr passthru from a dollar price standpoint. The 10X1 sector has traded through (on price) 15yrs for several months now. Although we do not have definitive data on the price relationship, we do keep comprehensive weekly spread data. Comparing this to 15yr static spreads of the MBS index produces a very interesting relative value point.

*Hybrid ARMs are demonstrably cheap on a nominal basis.*

**Figure 1: 5X1 Through 10X1 Spreads Now Cheap vs. 15yr Passthru**

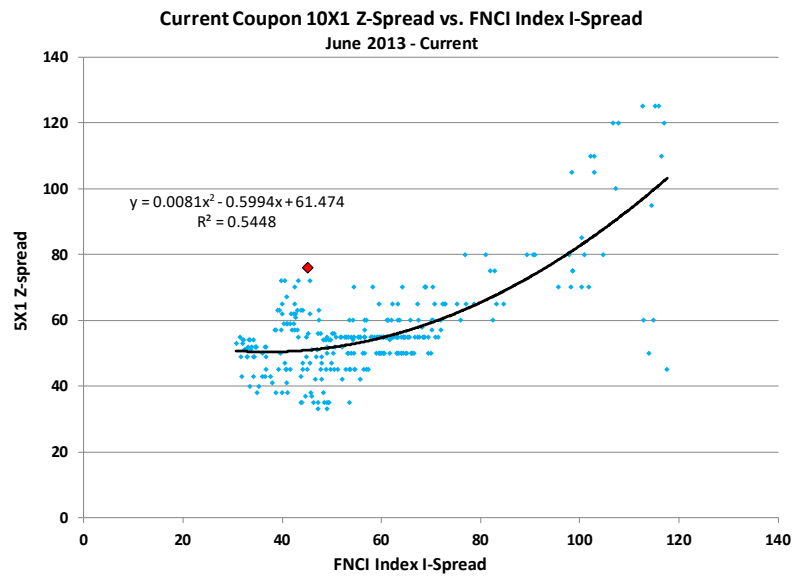


Source: FTN Financial and Bloomberg

After tracking 15yrs very closely for years, the Z-spread profile of the 10X1 sector has traded quite cheap vs. 15yrs since 2Q18. Recently, the 5X1 and 7X1 sectors have joined the party in terms of wider Z-spread of the ARMs vs. I-spread for the 15yr sector. In the case of all three ARM sectors, the current Z-spread is quite wide relative to the I-spread for the 15yr sector. This is displayed even more clearly in Figures 2 and 3 which transform the time series data above into scatter-plots.

10X1 spreads have tracked 15yr spreads very closely for six years.

Figure 2: 10X1 Z-spreads Are Informed By/Currently Cheap to 15yr I-spreads

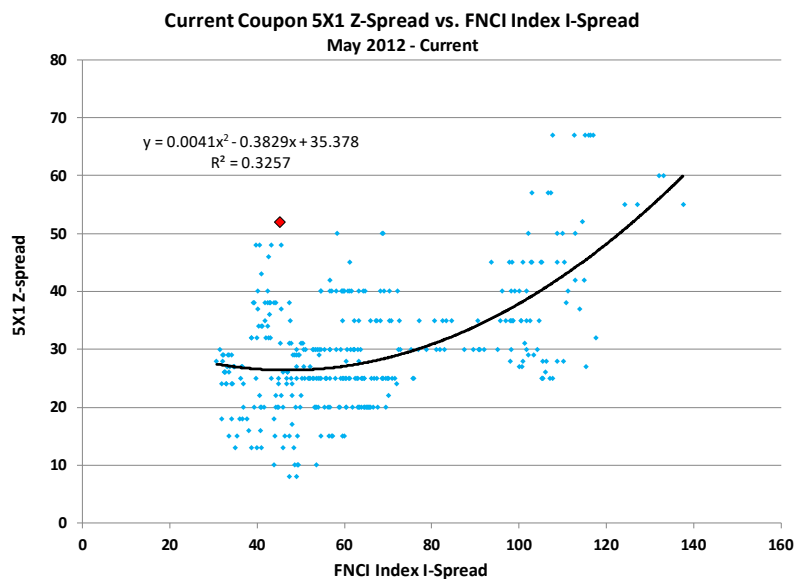


Source: FTN Financial and Bloomberg

The little blue dots represent all of the weekly spread relationships going back to June, 2013 in the case of the 10X1 data above. The larger red diamond represents the most recent data point. Therefore, the current Z-spread level for current coupon 10X1 paper is quite cheap relative to what would be predicted by the current level of the 15yr index I-spread.

5X1 Z-spreads are very wide relative to corresponding spreads on 15yr passthroughs.

Figure 3: 5X1 Paper Also Cheap on a Z-spread Basis, Fit Line Not as Good



Source: FTN Financial and Bloomberg

The available 5X1 Z-spread data go back further in time to mid-2012. This incorporates a very volatile period of both very narrow followed quickly by very wide mortgage spreads around the combined episodes of QE3 in 2012 and "taper tantrum" in 2013. Therefore, the fit line is not as solid with only a 33% R-squared for the 5X1 vs. 15yr data. However, the pattern is still recognizable, **and 5X1s are demonstrably cheap given the current level of the 15yr I-spread.**

That leads to the inevitable and important question: why are ARMs so cheap on a nominal basis? We think the answer is simple, and that simple answer provides a good strategy prescription going forward. Namely, **we believe that hybrid ARMs are cheap because the curve is flat.** A flat yield curve informs and drives the very unique prepayment profile of the hybrid ARM market.

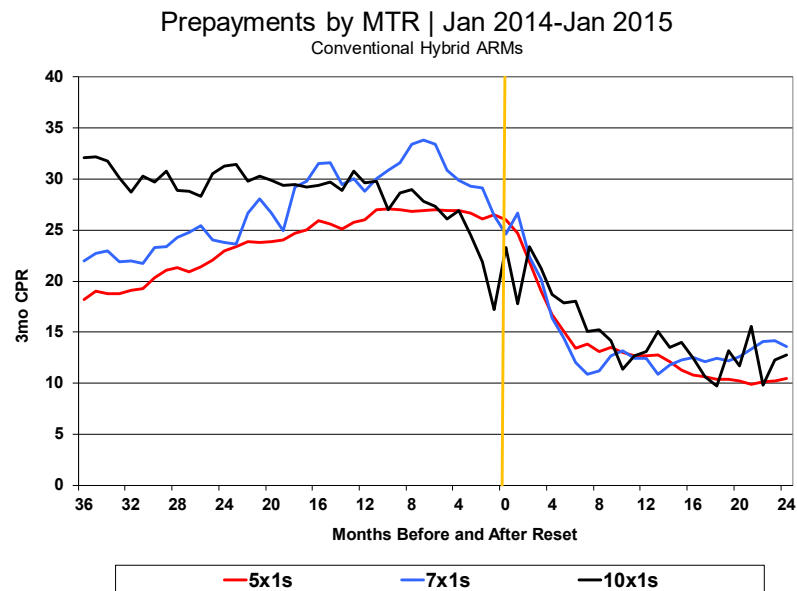
It comes down to this: **when the yield curve is flat, immediate pre-reset and post-reset prepayments tend to be much faster.** Why? **Borrowers have a strong incentive to refi out of their ARM loans to lock in fixed-rate funding for a very similar rate.** According to the weekly Freddie survey data, it would "cost" a borrower only 41 basis points in the current environment to lock in 30yr fixed vs. a 5X1 ARM. The daily bankrate.com data is even more stark. The national average 5X1 ARM rate is 3.82%, which is only 16 basis points lower than the national average 30yr fixed rate of 3.98% as of last night's close.

By contrast, that spread was well over 100 basis points for much of 2014 and it averaged 82 bps for the entire year. Therefore, even though overall rates were MUCH lower in 2H14 than they are today (the yield on the 5yr UST note traded in a range of ~1.30% to 1.80% in 2014 vs. a range of 2.15% to 3.09% during the last 12 months), **near-reset and post-reset prepayments were much lower in 2014 than they are currently.**

The ageing curves in Figures 4 and 5 below demonstrate this very clearly. First, the 2014 data.

2014 ageing curves reveal very slow post-reset speeds.

Figure 4: Ageing Curve from 2014 Demonstrates Tame Post-Reset Speeds

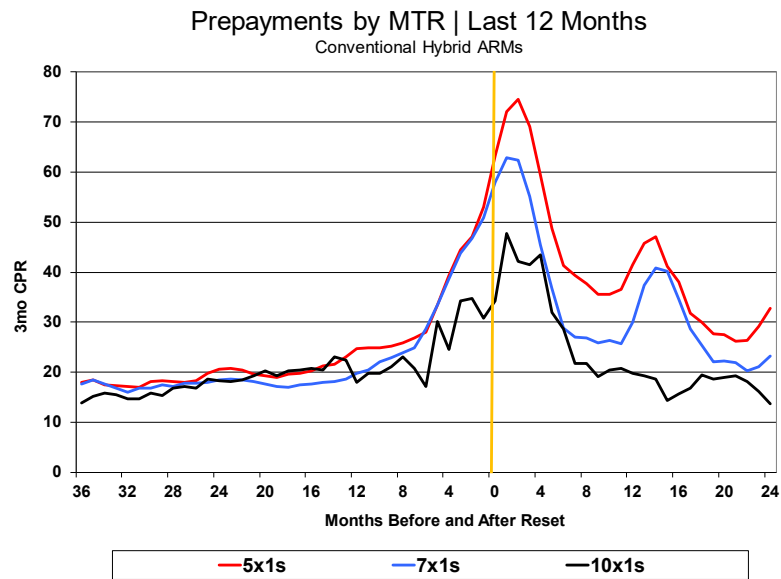


Source: FTN Financial and CPRCDR

Despite the fact the yield on the 2yr and 5yr UST note were much lower in 2014 than they are in the current environment, prepays around the reset and especially in the post-reset period were very low. In fact, they settled in the 10-15 CPR range. Contrast this to the current environment in Figure 5.

*Current speeds on near- and post-resets are much faster due to flatter YC.*

**Figure 5: Initial Prepays Slower Now, but Near-Reset and Post-Reset Speeds Much Faster**



Source: FTN Financial and CPRCDR

Because rates are a little higher, pre-reset prepays are not very fast at all, but they do spike significantly around the first reset. In the case of 5X1s and 7X1s, they also spike a little bit around the second and third resets (at month 12 and 24 after the initial reset) for those borrowers who somehow missed the first reset.

What does this mean for valuations? Hybrid ARM speeds have been picking up significantly over the past few years. Subsequently, Z-spreads have widened and post-reset prices have dropped. (Who remembers post-resets trading with \$106- and \$107-handles a few years ago?) **We think the sector has gotten cheap enough for investors to begin to onboard some of these assets in preparation for the next BIG move in the curve: a steepener.**

Prepayments on near-reset and post-reset hybrid ARMs are fast now, but they will very likely slow in the case of a steeper yield curve.

Certainly, the low-ish flat yield curve profile that currently exists could remain so for quite some time. However, it is simply prudent portfolio management to begin to look ahead and put some assets on the books that will likely do well if the curve outlook changes.

To that end, we have developed a trade scorecard in Figure 6 below that looks at the potential carry/risk and total return implications of going long low-WALA hybrid ARMs in favor of similar-duration 15yr paper. The investments are on-the-run low-WALA 5X1 and 7X1 paper. As stated above, the hybrid ARM sector has become so short that it is necessary to duration-adjust the trade, which we have done with 25% cash in the "sell 15yr 3.5" portfolio.

**Hybrid ARMs poised to outperform significantly in a re-steepening of the YC.**

**Figure 6: Clear Steepener and De-Risk Benefits in Hybrid ARMs**

**Swap/Switch Analysis**

as of 5/16/2019

	Security	Mtg Collateral	Type	Price	Par Amount	Market Value	WALA	WAM	Current Coupon	WAC	FICO	WA Ln Size	Curr LTV
Sell:	FNCI 3.5 6/19	FNCI	MBS 15yr	102.33	15,000,000	15,348,750	10	166	3.50	4.12	750	268,470	61.4
	Cash	Cash	Cash	100.00	5,000,000	5,000,000			2.47				
Buy:	FN CA2904	FNARM	5X1	102.02	10,000,000	10,201,500	9	351	3.43	4.08	764	309,153	65.5
	FN BM5736	FNARM	7X1	102.73	10,000,000	10,273,000	5	355	3.65	4.30	765	316,358	62.7
Buy Totals:				<b>102.37</b>	<b>20,000,000</b>	<b>20,474,500</b>	<b>7</b>	<b>353</b>	<b>3.54</b>	<b>4.19</b>	<b>765</b>	<b>312,788</b>	<b>64.1</b>
Sell Totals:				<b>101.75</b>	<b>20,000,000</b>	<b>20,348,750</b>			<b>3.25</b>				
Net Effect				<b>0.62</b>	<b>0</b>	<b>125,750</b>			<b>0.30</b>				

	Security	Mtg Collateral	Type	YTM	Avg Life	Static Spread	LIBOR OAS	Eff Dura	Eff Convz	Vol Dura*	YB Projection 1yr CPR	Historical LT CPR	Historical 1mo CPR	Historical 3mo CPR
Sell:	FNCI 3.5 6/19	FNCI	MBS 15yr	2.76	3.67	52.7	27.9	2.33	-1.67	0.87	18.2	17.3	15.9	12.3
	Cash	Cash	Cash	2.47	0.00	3.9	3.9	0.00	0.00	0.00				
Buy:	FN CA2904	FNARM	5X1	2.54	2.41	35.8	32.8	1.62	-0.73	-0.44	27.3	33.2	0.5	11.9
	FN BM5736	FNARM	7X1	2.63	2.98	44.7	33.6	1.90	-1.02	-0.06	23.2	27.4	22.7	
Buy Totals:				<b>2.59</b>	<b>2.69</b>	<b>40.2</b>	<b>33.2</b>	<b>1.76</b>	<b>-0.87</b>	<b>-0.25</b>	<b>25.2</b>	<b>30.3</b>	<b>11.6</b>	
Sell Totals:				<b>2.69</b>	<b>2.77</b>	<b>40.7</b>	<b>22.0</b>	<b>1.75</b>	<b>-1.26</b>	<b>0.66</b>				
Net Effect				<b>-0.10</b>	<b>-0.07</b>	<b>-0.5</b>	<b>11.2</b>	<b>0.00</b>	<b>0.39</b>	<b>-0.91</b>				

	Security	Mtg Collateral	Type	12mo TRR							
				Forward	upsteep	upflat	up100	base	dn100	dnflat	dnsteep
Sell:	FNCI 3.5 6/19	FNCI	MBS 15yr	2.96	1.60	1.92	0.56	2.83	3.68	3.13	3.65
	Cash	Cash	Cash	2.28	2.42	2.92	2.92	2.42	1.91	2.42	1.91
Buy:	FN CA2904	FNARM	5X1	2.84	2.65	1.79	1.60	2.66	3.27	2.64	3.48
	FN BM5736	FNARM	7X1	2.91	2.43	1.77	1.22	2.74	3.46	2.81	3.67
Buy Totals:				<b>2.87</b>	<b>2.54</b>	<b>1.78</b>	<b>1.41</b>	<b>2.70</b>	<b>3.36</b>	<b>2.73</b>	<b>3.57</b>
Sell Totals:				<b>2.79</b>	<b>1.80</b>	<b>2.16</b>	<b>1.14</b>	<b>2.73</b>	<b>3.24</b>	<b>2.95</b>	<b>3.22</b>
Net Effect				<b>0.08</b>	<b>0.74</b>	<b>-0.38</b>	<b>0.27</b>	<b>-0.03</b>	<b>0.12</b>	<b>-0.23</b>	<b>0.35</b>

\* Grossed up by a factor of 100.

All analytics performed on the Yield Book using the current prepayment model.  
Total Return analytics assume constant-OAS pricing.  
upsteep - 3mo unchanged, 5yr up 50bps, 10yr up 100 bps upflat - 3mo up 100bps, 5yr up 50bps, 10yr unchanged  
dnflat - 3mo unchanged, 5yr dn 50bps, 10yr dn 100 bps dnsteep - 3mo dn 100 bps, 5yr dn 50 bps, 10yr unchanged

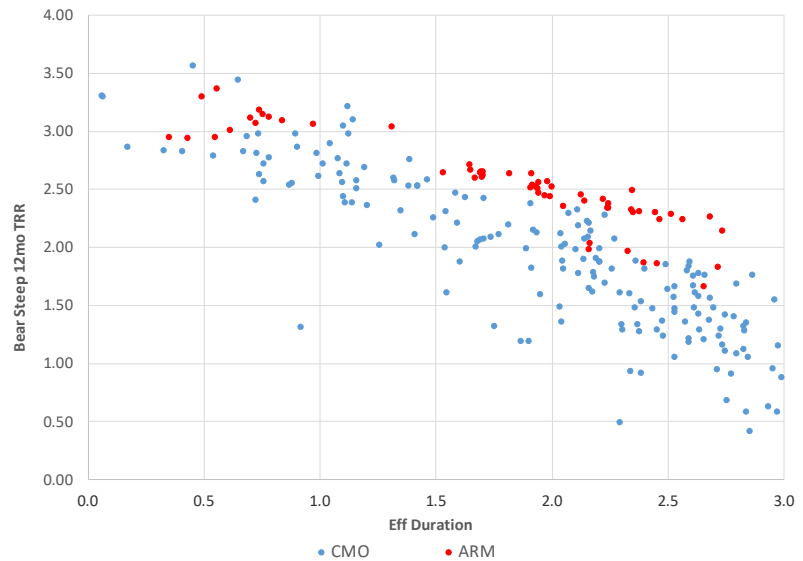
Source: FTN Financial, YieldBook

The trade-offs to this strategy are clear. There is a minor carry give, but the OAS, convexity and volatility duration improvements are significant. Most importantly for the purposes of this strategy idea, **the projected TRR outperformance is most pronounced in the STEEPENER scenarios, both rates up and rates down.** There is also good TRR performance in the parallel moves up and down. The trade underperforms only in the curve inversion scenarios, which we expected going in.

To put an even finer point on the relative value proposition for hybrid ARMs, we ran some extensive analysis of the sector relative to short (i.e. 0-3yr effective duration) CMOs. Since short CMOs have, by definition, a fair amount of seasoning and/or structure to them, they also have good steepener partials. Therefore, the hybrid ARM/CMO decision is a bit more directional. Both sectors should outperform wider-window mortgage product in a steepener (as demonstrated in Figure 6 above). However, hybrid ARMs do better in a **bear steepener** and CMOs tend to outperform in a **bull steepener**. We make this point in Figures 7 and 8 below as we display the projected 12mo TRRs vs. effective duration for a large data set of CMOs and ARMs in the marketplace.

**Prefer hybrid ARMs to CMOs in a bear steepener.**

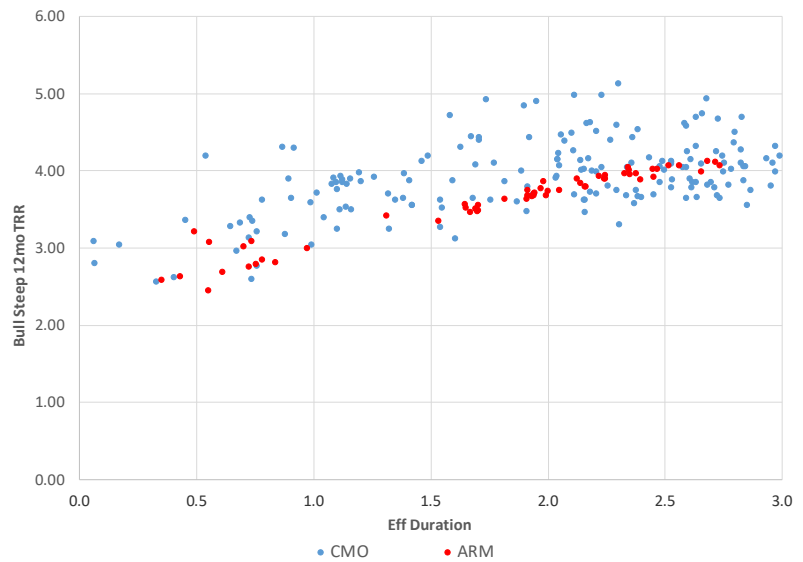
**Figure 7: Bear Steepener Clearly Favors Hybrid ARM Sector In Front of the Curve**



Source: FTN Financial and YieldBook

**Many CMOs should perform better in a bull steepener.**

**Figure 8: Hybrid ARMs Good in Bull Steepener, but Many CMOs Perform Better**



Source: FTN Financial and YieldBook

The scenarios in Figures 7 and 8 are the same as in Figure 6: 100 bps of steepening with the direction corresponding to “bear” and “bull”.

The MBS market is quite efficient, and there are good reasons why hybrid ARM Z-spreads are now cheap to 15yr paper on a nominal basis. But portfolio management is not simply a matter of explaining the past. It is about setting up the portfolio for best-chance future outcomes. For investors who have little to no performance exposure to a re-steepening of the yield curve, layering in low-WALA hybrid ARMs at the current juncture looks to be a prudent risk management strategy.

**MBS Snapshot**

	May 16, 2019	Z-Score*	Change			52 Week			
			Week	MTD	YTD	High	Low	Avg	
<b>Prices</b>									
30 Year	3.0	99.23	1.7	0.34	0.27	1.66	99.91	93.98	96.87
	3.5	101.25	1.6	0.23	0.23	1.25	101.59	96.78	99.38
	4.0	102.81	1.5	0.14	0.13	0.84	103.00	99.48	101.61
	4.5	104.22	1.2	0.16	0.11	0.66	104.69	101.95	103.54
	5.0	105.66	0.9	0.22	0.22	0.89	106.28	103.92	105.20
	5.5	106.92	0.5	(0.14)	0.14	1.11	107.75	105.78	106.65
	6.0	108.52	0.3	0.34	0.33	1.16	112.38	107.03	108.23
15 Year	6.5	111.06	1.5	0.17	0.23	1.45	111.58	107.31	109.79
	2.5	99.22	1.8	0.19	0.23	1.50	99.58	95.44	97.35
	3.0	100.84	1.9	0.28	0.28	0.97	101.06	97.86	99.40
	3.5	102.42	1.8	0.16	0.28	1.17	102.58	99.66	101.12
	4.0	103.11	1.6	0.05	0.11	0.73	103.16	101.41	102.40
	4.5	101.86	0.8	(0.64)	0.06	0.84	104.94	100.36	101.36
	5.0	101.67	-0.8	0.03	(0.11)	0.09	103.75	100.22	102.38
20 Year	5.5	102.23	-0.9	0.11	0.11	0.34	105.48	99.53	103.44
	3.0	99.98	1.4	0.16	0.11	1.22	100.53	95.63	98.12
	3.5	102.08	1.6	0.09	0.06	0.92	102.23	98.36	100.44
	4.0	103.75	1.5	0.05	0.00	0.84	103.77	100.83	102.59
	4.5	104.91	1.1	0.09	0.05	0.63	105.02	102.78	104.27
	5.0	105.61	0.8	0.17	0.17	0.84	106.00	104.02	105.19
	5.5	106.88	0.5	(0.19)	0.09	1.06	107.53	105.81	106.64
6.0	108.55	0.4	0.38	0.36	1.19	110.13	107.08	108.20	

<b>I-Spreads (UST)</b>									
30 Year	3.0	69.2	2.1	7.3	3.0	3.8	70.1	52.0	60.2
	3.5	86.8	1.9	8.2	3.1	7.6	87.6	57.8	71.7
	4.0	99.2	1.4	7.6	2.1	1.4	103.5	65.7	85.0
	4.5	95.0	0.2	4.1	(2.6)	-15.0	115.2	70.2	92.9
	5.0	86.7	-0.7	0.1	(5.5)	-36.9	127.6	74.8	97.4
	5.5	101.1	-0.4	(5.2)	(6.2)	-43.9	149.1	78.2	108.9
	6.0	130.4	0.7	(3.9)	(9.6)	-16.3	159.1	57.0	112.9
15 Year	6.5	208.9	1.3	1.3	18.1	9.8	227.9	17.2	171.5
	2.5	43.7	-0.3	9.1	3.3	-14.8	69.6	7.1	47.8
	3.0	47.4	1.2	5.1	0.8	-0.8	49.8	30.7	41.7
	3.5	46.1	0.7	9.9	2.4	-9.7	57.4	7.2	41.9
	4.0	46.1	1.9	6.7	1.9	5.1	51.1	1.2	24.3
	4.5	93.8	-0.3	16.7	(1.2)	-1.8	148.8	54.5	99.7

**Primary Market**

<b>Mortgage Rates</b>		<b>52 Week</b>							
Conforming	30 Year	3.98	-2.8	(0.11)	(0.11)	(0.53)	4.82	4.02	4.48
	15 Year	3.44	-2.4	(0.06)	(0.09)	(0.32)	4.14	3.40	3.83
	5x1 Hybrid	3.78	-2.5	(0.22)	(0.18)	(0.16)	4.51	3.89	4.15

<b>Borrower Activity</b>		<b>52 Week</b>						
MBA Refinance Index	1,233	1.2	(6)	4	503	1,786	730	1,006
MBA Purchase Index	269	1.5	(2)	9	50	281	219	245

**Z-Score (12mo):**  
**Green** 1.0 standard deviation low price or high yield/spread  
**Yellow** Mean  
**Red** 1.0 standard deviation high price or low yield/spread



**CMO Spreads**

		May 16, 2019	Z-Score	Change			52 Week		
				Week	MTD	YTD	High	Low	Avg
<b>PACs</b>									
30 Year	2 yr	40	0.8	0	0	3	45	30	36
	3 yr	52	1.1	0	2	4	55	37	46
	4 yr	65	0.5	1	3	0	72	55	63
	5 yr	67	0.4	0	(1)	0	75	55	65
	7 yr	80	1.2	0	(2)	13	85	55	69
	10 yr	105	1.4	0	0	15	110	68	87
15 Year	2 yr	40	0.8	0	0	3	45	30	36
	3 yr	52	1.5	0	2	7	53	35	44
	4 yr	63	1.1	3	5	1	67	45	57
	5 yr	67	0.5	0	(1)	0	75	50	63
	7 yr	80	1.2	0	(2)	13	85	55	68
	10 yr	105	1.5	0	0	15	105	62	85

<b>Sequentials</b>									
30 Year	2 yr	40	0.8	0	0	3	45	30	36
	3 yr	52	1.5	0	2	7	53	37	45
	4 yr	65	0.6	2	5	0	72	57	63
	5 yr	67	-0.1	0	(1)	(1)	75	60	67
	7 yr	80	1.2	0	(2)	8	85	60	71
	10 yr	105	1.4	0	0	22	110	62	87
15 Year	2 yr	40	0.8	0	0	3	45	30	36
	3 yr	52	1.5	0	2	7	53	35	44
	4 yr	60	0.6	3	5	(2)	67	45	57
	5 yr	67	0.5	0	(1)	0	75	52	64
	7 yr	80	1.2	0	(2)	10	85	54	68
	10 yr	100	1.3	0	0	12	105	60	83

<b>ARM (Z-spreads)</b>									
1x1 (CMT)	4.00	2.45		2.45	2.45	0.00	n/a	n/a	n/a
1x1 (LIBOR)	4.00	2.45		2.45	2.45	0.00	n/a	n/a	n/a
5x1 2/2/5	2.00	46	2.4	4	4	13	46	19	29
	2.50	52	2.5	4	4	14	52	24	34
	3.00	54	2.4	4	4	13	54	27	37
7x1 5/2/5	2.00	53	2.4	4	4	13	53	26	36
	2.50	58	2.4	4	4	12	58	32	42
	3.00	59	2.4	4	4	13	59	32	42
10x1 5/2/5	2.00	71	2.4	4	4	13	71	44	54
	2.50	76	2.4	4	4	13	76	49	59
	3.00	78	2.5	4	4	14	78	50	60

\* YTM

\*\* Spreads calculated to 15 CPB.

<b>CMO Floater (Discount Margins)</b>									
Passthru	6.5 Cap	46	1.1	(1)	(1)	5	48	29	38
	7.0 Cap	42	1.1	(1)	(1)	5	44	26	34
Support	5.0 Cap	100	-0.2	0	0	(15)	115	85	102
	5.5 Cap	90	-0.6	0	0	(15)	105	80	95
	6.0 Cap	80	-0.7	0	0	(15)	112	75	84

### Alternative Markets

			Change				52 Week		
May 16, 2019			Z-Score	Week	MTD	YTD	High	Low	Avg
<b>CMBS Spreads</b>									
New Issue	3y	35	0.3	(2)	(3)	(12)	47	25	33
	5y	53	-0.1	(2)	(2)	(15)	68	45	54
	7y	69	-1.2	(1)	(3)	(21)	90	65	75
	10y	83	-1.3	(2)	(3)	(22)	105	82	90
<b>ACMBS</b>									
Fixed (N-Spread)	7y	41	0.8	1	0	(7)	48	27	36
	10y	55	-0.2	1	0	(13)	68	48	56
Floating (DM)	7y	47	1.0	0	0	(1)	49	19	37
	10y	51	1.0	0	0	1	53	22	40
<b>RMBS 2.0</b>									
AAA CC Price Drop	15yr	(0.81)	n/a	0.00	0.00	n/a	n/a	n/a	n/a
	30yr	(1.50)	(0.15)	0.00	0.00	0.25	(0.93)	(1.75)	(1.47)
Sprd to Swaps	Front SEQ	82	n/a	n/a	n/a	n/a	n/a	n/a	n/a
<b>Agencies</b>									
Bullets	2y	0.9	-1.6	(0.8)	(1.0)	(3.9)	6.3	0.9	3.5
	3y	5.2	-0.3	0.2	0.1	(1.4)	8.2	3.3	5.5
	5y	5.3	-1.9	0.4	(0.1)	(5.3)	13.6	4.8	9.5
	10y	23.4	-1.0	1.4	1.6	(10.5)	34.5	21.8	26.6
Callables	5NC1	40.2	-1.0	1.4	(0.8)	(15.6)	58.9	36.7	45.6
	7NC1	61.9	-1.1	2.3	4.9	(31.6)	97.0	52.1	73.0
	10NC1	79.8	-1.6	(0.1)	0.1	(38.5)	119.8	78.5	96.6
	15NC1	93.3	-1.8	(0.5)	0.0	(51.6)	145.5	93.2	116.6

### MBS Index

			Change				52 Week		
			Week	MTD	YTD	High	Low	Avg	
<b>Static</b>									
Price	102.38	2.2	0.28	0.31	1.65	102.35	98.14	100.19	
Coupon	3.63	2.1	0.00	0.00	0.04	3.63	3.55	3.58	
Yield	3.07	-2.4	(0.07)	(0.07)	(0.35)	3.87	3.05	3.50	
WAL	5.91	-2.5	(0.20)	(0.15)	(0.80)	7.75	5.75	7.08	
<b>Option-Adjusted</b>									
Effective Duration	3.69	-2.1	(0.21)	(0.16)	(0.51)	5.69	3.54	4.80	
Effective Convexity	-1.75	-2.2	(0.01)	(0.06)	(0.37)	-0.88	-1.76	-1.32	
LOAS (bps)	42	1.7	4.20	2.37	6.27	44	19	30	
<b>Mix</b>									
30YR	89.7%	2.0	0.0%	0.1%	0.7%	89.6%	88.3%	88.8%	
15YR	10.3%	-2.0	0.0%	-0.1%	-0.7%	11.7%	10.4%	11.2%	

### Nominal Return

5 Day	0.19%
10 Day	0.47%
MTD	0.47%
QTD	0.59%
YTD	2.73%
12 Month	5.08%

Source: MTGINDEX data from the Yield Book.

**Specified Pool Carry and Breakevens**

As of 5/13/2019

Coupon	Specification	Payup		WAC	WALA	1-Month		Cohort Hist. CPR		Carry (ticks)	B/E Months	YTM	WAL	Libor OAS	Effective Duration	Effective Convexity
		(ticks)	Price			Proj	CPR ^	1mo	3mo							
3.0	TBA (Cheapest to Deliver)		99.234	3.81	20	8.2	4.9	5.7	1.64		3.11	8.00	36.30	5.33	-22.81	
3.0	LLB 85k	14.0	99.672	3.51	31	10.0	7.4	7.5	1.50	n/a	3.04	7.80	48.42	6.21	-0.49	
3.0	MLB 110k	12.0	99.609	3.57	33	10.2	6.7	7.3	1.52	n/a	3.05	7.84	47.13	6.08	-0.70	
3.0	HLB 150k	8.0	99.484	3.51	32	10.2	5.9	6.8	1.58	n/a	3.07	7.86	44.96	5.84	-1.16	
3.0	175k Max	4.0	99.359	3.67	35	10.7	5.7	6.6	1.63	n/a	3.09	7.70	44.30	5.64	-1.43	
3.0	200k Max	2.0	99.297	3.68	34	10.9	4.9	6.0	1.66	87.0	3.10	7.74	43.54	5.61	-1.60	
3.0	New Wala	0.0	99.234	4.22	6	14.6	0.1	0.0	1.76	n/a	3.13	5.95	16.77	4.74	-4.41	
3.0	20yr	30.0	100.172	3.61	33	9.7	5.1	5.6	1.29	n/a	2.95	5.91	41.09	4.25	-1.39	
3.0	Conv. Jumbo (CK)	-28.0	98.359	3.77	34	8.9	3.8	4.0	1.98	n/a	3.23	8.58	44.67	5.49	-2.93	
3.0	100% Investor	0.0	99.234	3.92	37	9.5	4.9	4.9	1.67	n/a	3.10	8.31	41.51	5.70	-2.00	
3.5	TBA (Cheapest to Deliver)		101.250	4.22	13	12.5	7.3	8.0	2.19		3.25	6.43	41.05	3.91	-3.86	
3.5	LLB 85k	40.0	102.500	4.02	22	9.9	6.5	7.2	1.80	n/a	3.08	7.51	49.21	5.67	-0.93	
3.5	MLB 110k	34.0	102.313	4.05	25	10.4	6.9	7.4	1.83	n/a	3.11	7.55	48.75	5.43	-1.30	
3.5	HLB 150k	24.0	102.000	4.04	17	8.4	6.3	7.0	2.09	n/a	3.17	7.71	48.06	5.20	-1.96	
3.5	175k Max	20.0	101.875	3.96	36	12.5	6.1	6.5	1.88	n/a	3.17	7.31	50.11	4.93	-1.84	
3.5	200k Max	14.0	101.688	3.95	20	9.1	3.5	4.9	2.16	n/a	3.22	7.78	48.73	5.00	-2.41	
3.5	New Wala	0.0	101.250	4.63	5	32.4	2.7	2.7	1.22	n/a	3.08	3.87	11.55	2.45	-4.11	
3.5	20yr	31.0	102.219	4.00	28	11.4	5.5	6.2	1.80	n/a	3.02	5.60	38.22	3.35	-2.18	
3.5	Conv. Jumbo (CK)	-28.0	100.375	4.29	35	15.5	5.5	4.9	2.56	n/a	3.42	7.04	55.50	4.20	-3.72	
3.5	100% Investor	0	101.250	4.19	37	10.3	5.6	6.3	2.28	n/a	3.30	8.26	52.31	4.76	-2.99	
4.0	TBA (Cheapest to Deliver)		102.813	4.76	8	22.9	6.6	7.1	1.88		3.21	4.43	44.58	2.52	-3.32	
4.0	LLB 85k	72.0	105.063	4.40	22	11.6	8.4	8.7	1.96	n/a	3.12	7.12	53.05	5.10	-1.08	
4.0	MLB 110k	58.0	104.625	4.39	20	11.2	7.4	8.3	2.21	175.8	3.19	7.12	54.90	4.77	-1.59	
4.0	HLB 150k	48.0	104.313	4.43	25	12.3	7.2	7.9	2.19	154.3	3.22	6.91	52.03	4.20	-2.29	
4.0	175k Max	37.0	103.969	4.38	36	14.3	7.0	7.7	2.10	169.7	3.28	6.89	58.64	4.20	-2.11	
4.0	200k Max	27.0	103.656	4.39	23	13.1	5.0	5.6	2.41	51.1	3.32	6.75	55.10	3.71	-2.98	
4.0	New Wala	2.0	102.875	4.92	6	15.8	3.6	3.4	2.54	3.0	3.24	4.61	46.59	3.20	-2.98	
4.0	20yr	33.0	103.844	4.40	24	14.0	7.3	8.3	2.21	100.6	3.09	4.99	46.14	2.82	-2.25	
4.0	Conv. Jumbo (CK)	-30.0	101.875	4.65	26	31.5	8.7	7.5	2.01	n/a	3.48	4.70	59.16	2.54	-3.70	
4.0	100% Investor	4.0	102.938	4.65	27	14.3	7.2	7.5	2.65	5.2	3.45	6.84	60.98	3.45	-3.49	
4.5	TBA (Cheapest to Deliver)		104.219	5.25	7	26.1	9.8	10.0	171.00		3.14	3.73	54.90	2.07	-2.30	
4.5	LLB 85k	103.0	107.438	4.93	20	12.6	8.1	9.1	2.14	239.5	3.17	6.89	58.76	4.72	-1.05	
4.5	MLB 110k	87.0	106.938	4.88	28	14.6	9.2	9.4	1.93	383.3	3.20	6.56	56.61	4.01	-1.74	
4.5	HLB 150k	68.0	106.344	4.93	27	15.2	8.3	9.3	2.12	165.0	3.27	6.34	61.01	3.71	-2.01	
4.5	175k Max	53.0	105.875	4.84	39	16.5	8.0	9.0	2.13	125.3	3.35	6.30	66.77	3.51	-2.18	
4.5	200k Max	39.0	105.438	4.89	24	17.1	12.8	4.6	2.28	68.3	3.33	5.75	63.13	3.02	-2.50	
4.5	New Wala	6.0	104.406	5.37	6	20.6	4.3	3.7	2.39	8.7	3.10	3.72	53.20	2.39	-1.89	
4.5	20yr	24.0	104.969	4.98	22	18.7	7.2	9.3	2.30	40.3	3.14	4.31	61.83	2.59	-1.51	
4.5	Conv. Jumbo (CK)	-44.0	102.844	4.90	34	19.6	6.9	8.9	3.64	n/a	3.89	5.94	113.56	3.79	-2.50	
4.5	100% Investor	8.0	104.469	4.84	36	17.0	8.8	9.4	2.90	6.7	3.59	6.20	82.44	3.06	-2.97	
5.0	TBA (Cheapest to Deliver)		105.656	5.73	9	18.0	8.8	12.4	3.47		2.96	3.23	54.97	1.72	-1.18	
5.0	LLB 85k	124.0	109.531	5.58	25	15.2	8.5	9.0	1.83	n/a	3.19	6.43	64.49	4.30	-0.91	
5.0	MLB 110k	111	109.125	5.29	28	15.6	11.4	14.2	1.94	n/a	3.23	6.33	61.63	3.55	-1.78	
5.0	HLB 150k	84	108.281	5.33	25	18.0	9.3	9.5	1.76	n/a	3.17	5.47	56.50	2.85	-1.83	
5.0	175k Max	57	107.438	5.27	40	20.4	11.8	15.3	1.69	n/a	3.27	5.20	69.03	2.74	-1.73	
5.0	200k Max	40	106.906	5.64	21	24.3	5.9	6.8	1.12	n/a	2.99	4.04	48.66	1.96	-1.35	
5.0	New Wala	6	105.844	5.95	5	22.4	4.3	4.3	2.43	n/a	3.13	3.69	63.95	2.01	-1.29	
5.0	100% Investor	10	105.969	5.31	26	26.4	11.2	12.2	1.47	n/a	3.30	4.22	71.82	1.80	-1.87	

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