

# The Speculation Miscalculation: Don't Beat the Market, Be the Market



Presented by:

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Webinar: October 27, 2020



## Timing the Market vs. Dynamic Allocations

For starters, let's first understand there is a difference between timing the market for speculative purposes and making investment decisions based on current (*not predicted future*) conditions in the market.

Speculators in the public fund world make decisions about specific investments based on their inherent belief about the future.

Examples:

- 1) Buying long callables with short lockouts assuming they will be called (extreme liquidity chasing yield).
- 2) Buying lower grade credit based on Fed backing.
- 3) Buying structured products (variable rates, inflation linked, steps, etc..) for non duration based purposes.

However, the most common speculators are those who commit errors of omission instead of errors of commission.

***Those who hold off on investing because market no longer exhibits same value they believe it once did.***

## Anchoring and Adjustment Bias (cognitive)

Investment managers exhibiting this bias are often influenced by purchase “points,” or arbitrary price levels or price indexes, and tend to cling to these numbers when facing questions like, “Should I buy or sell this security?” or “Is the market overvalued or undervalued right now?”

“Why would I buy this 3yr at 2.85% when it was just 3%! , this is my bogey!”

3Yr Tsy Over Two Months	\$5MM Investment	Opp Cost
3Yr Tsy on 11/09/18@ 3.00%	\$450,000.00	
3Yr Tsy on 11/16/18@ 2.85%	\$427,500.00	\$22,500.00

	Cumulative Opportunity Cost	
3Yr Tsy on 11/23/18@ 2.83%	\$424,500.00	\$25,500.00
3Yr Tsy on 11/30/18@ 2.83%	\$424,500.00	\$25,500.00
3Yr Tsy on 12/07/18@ 2.72%	\$408,000.00	\$42,000.00
3Yr Tsy on 12/14/18@ 2.72%	\$408,000.00	\$42,000.00
3Yr Tsy on 12/21/18@ 2.61%	\$391,500.00	\$58,500.00
3Yr Tsy on 12/28/18@ 2.50%	\$375,000.00	\$75,000.00
3Yr Tsy on 01/04/19@ 2.47%	\$370,500.00	\$79,500.00
3Yr Tsy on 01/11/19@ 2.51%	\$376,500.00	\$73,500.00

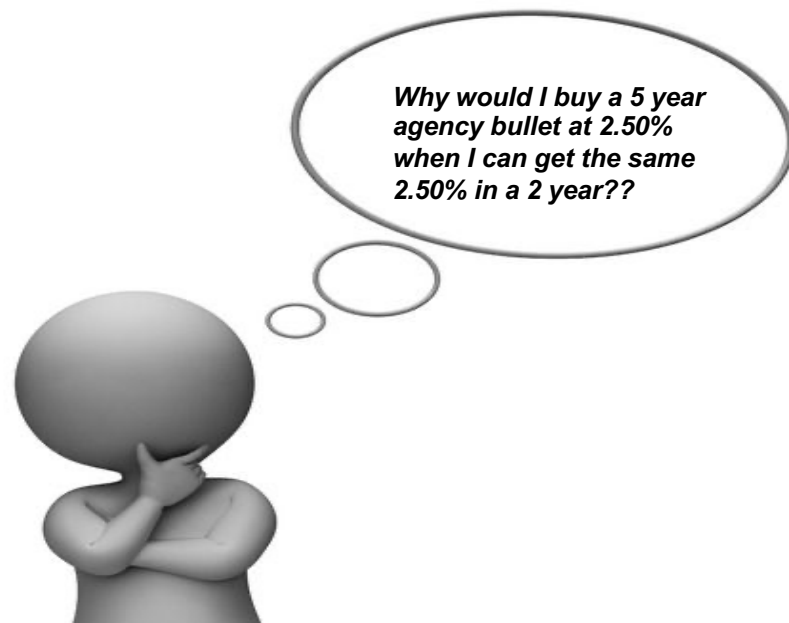
*\*Does not account for cash carry, assumes buying 3yr on dates listed*

## Availability Bias Exercise

### The Truth About Flat Yield Curves

Time Value of Money is a funny thing. It presents us with linear like qualities that equate value to time. This can skew our thinking when yield curves flatten and value no longer shows up in the normal calculated manner.

In essence, investors have a tendency to stop their investing points where value no longer accrues in a meaningful way.

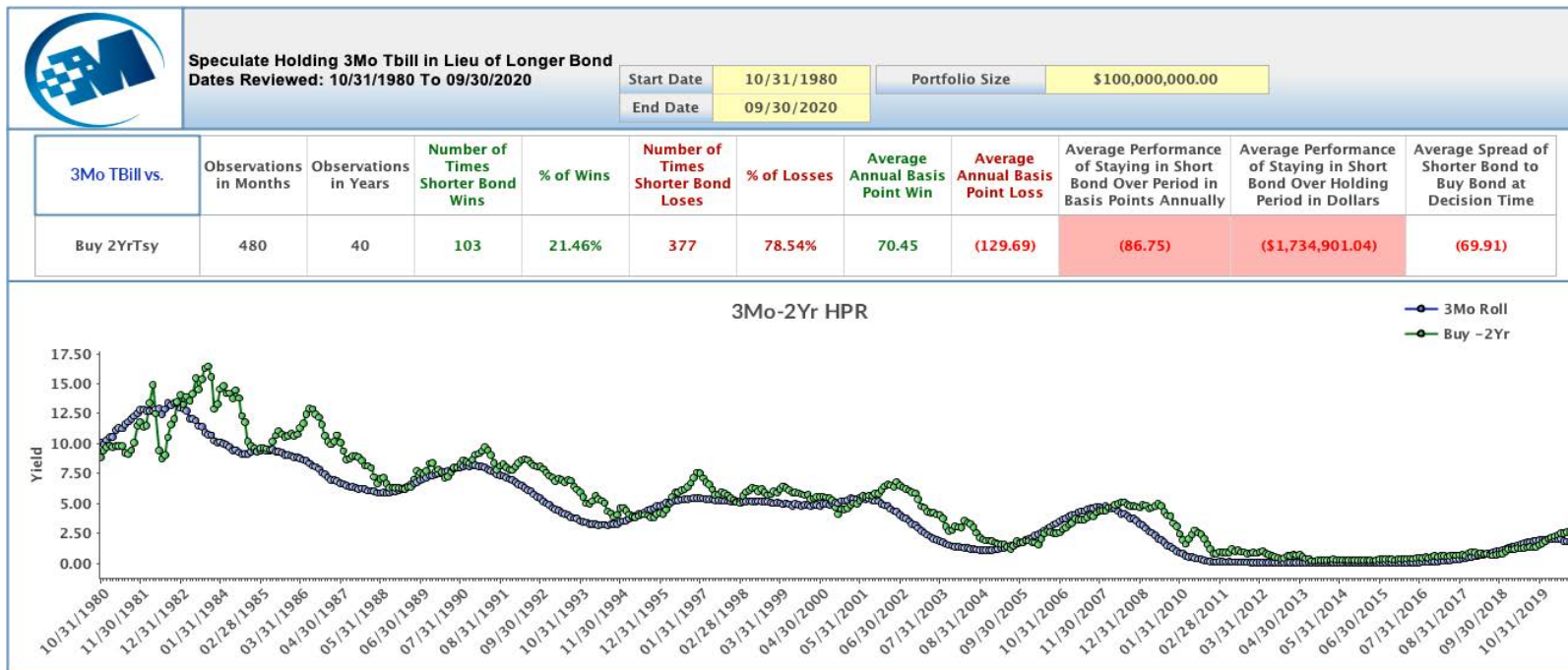


# Availability Bias Exercise

## The Truth About Flat Yield Curves

Rates: Oct 1980 to Sep 2020  
\$100MM Portfolio

Buy: 3Mo, Roll 3Mo  
Buy: 2Yr



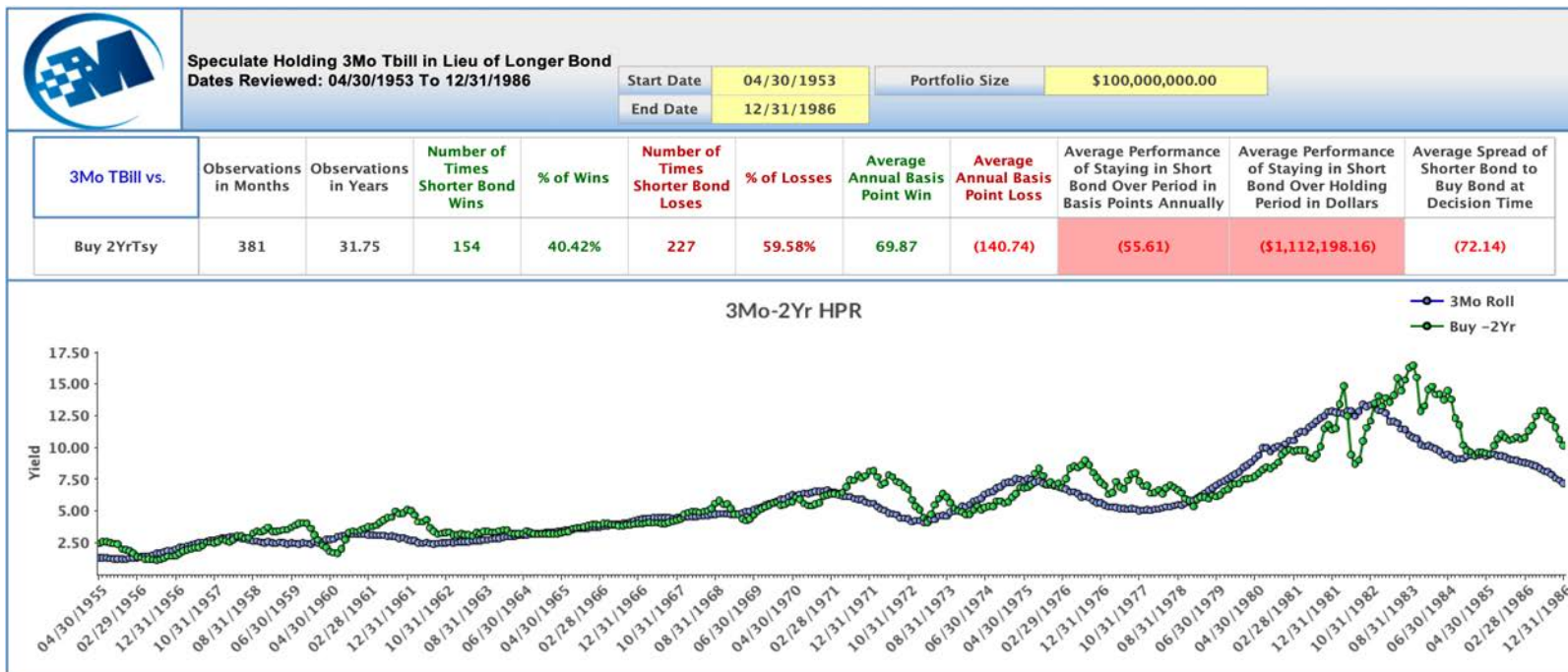
Source: H.15 CMT Data – Federal Reserve

# Availability Bias Exercise

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Rates: Apr 1953 to Dec 1981  
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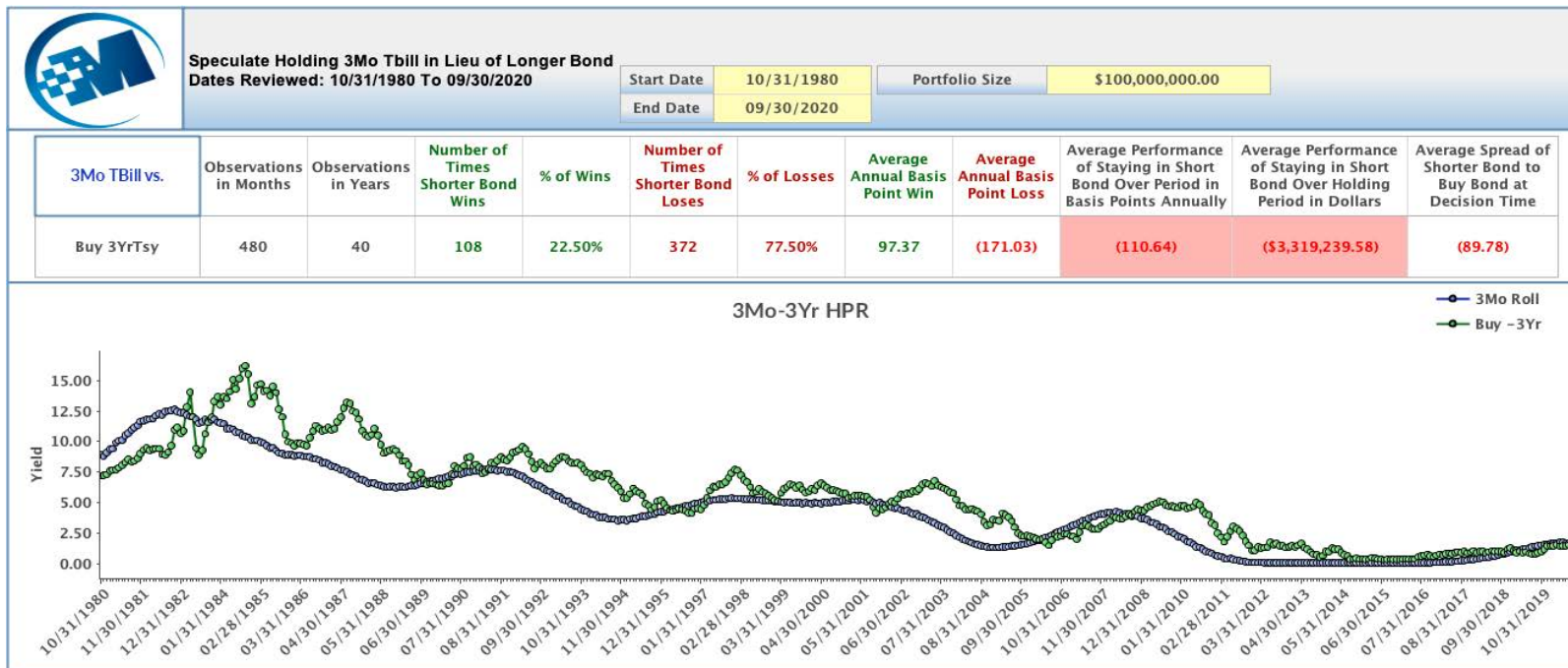
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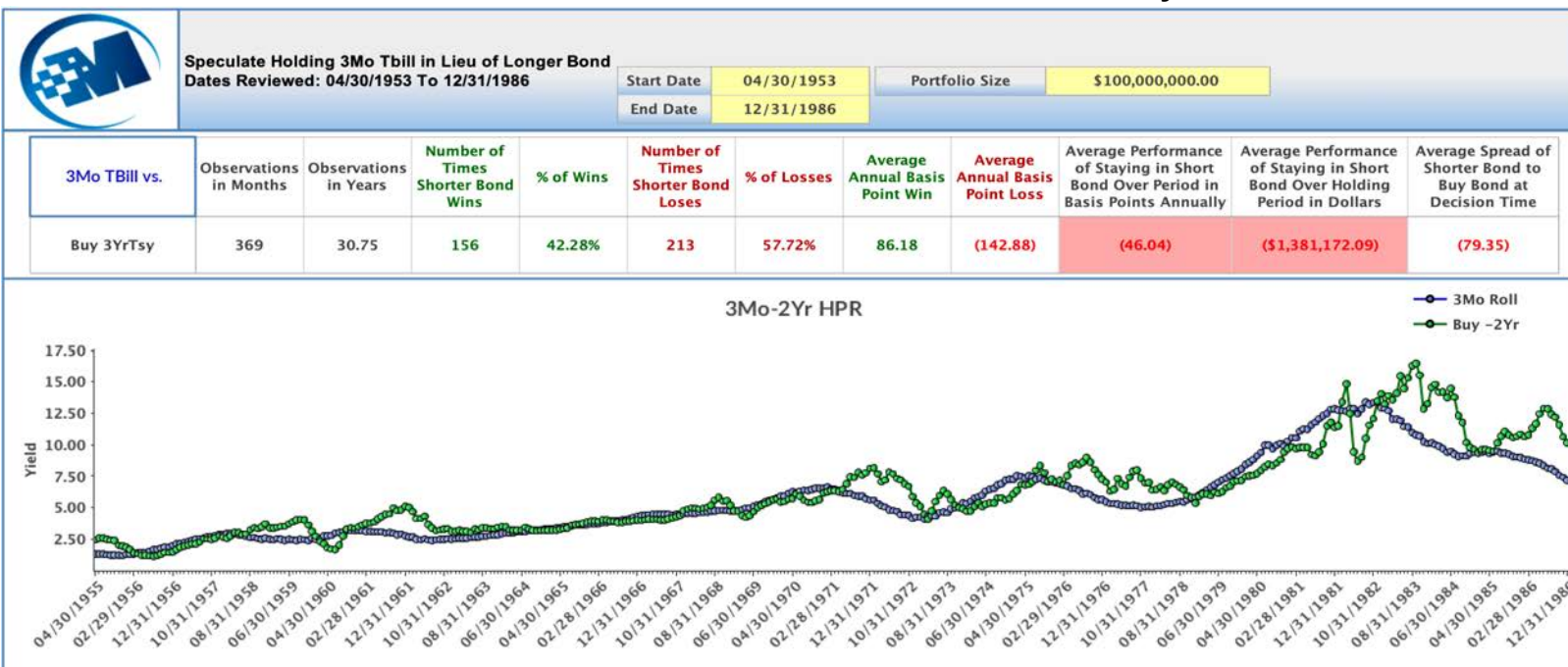
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Source: H.15 CMT Data – Federal Reserve



# Availability Bias Exercise

## The Truth About Flat Yield Curves

Rates: Oct 1980 to Sep 2020  
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Buy: 3Mo, Roll 3Mo  
Buy: 5Yr



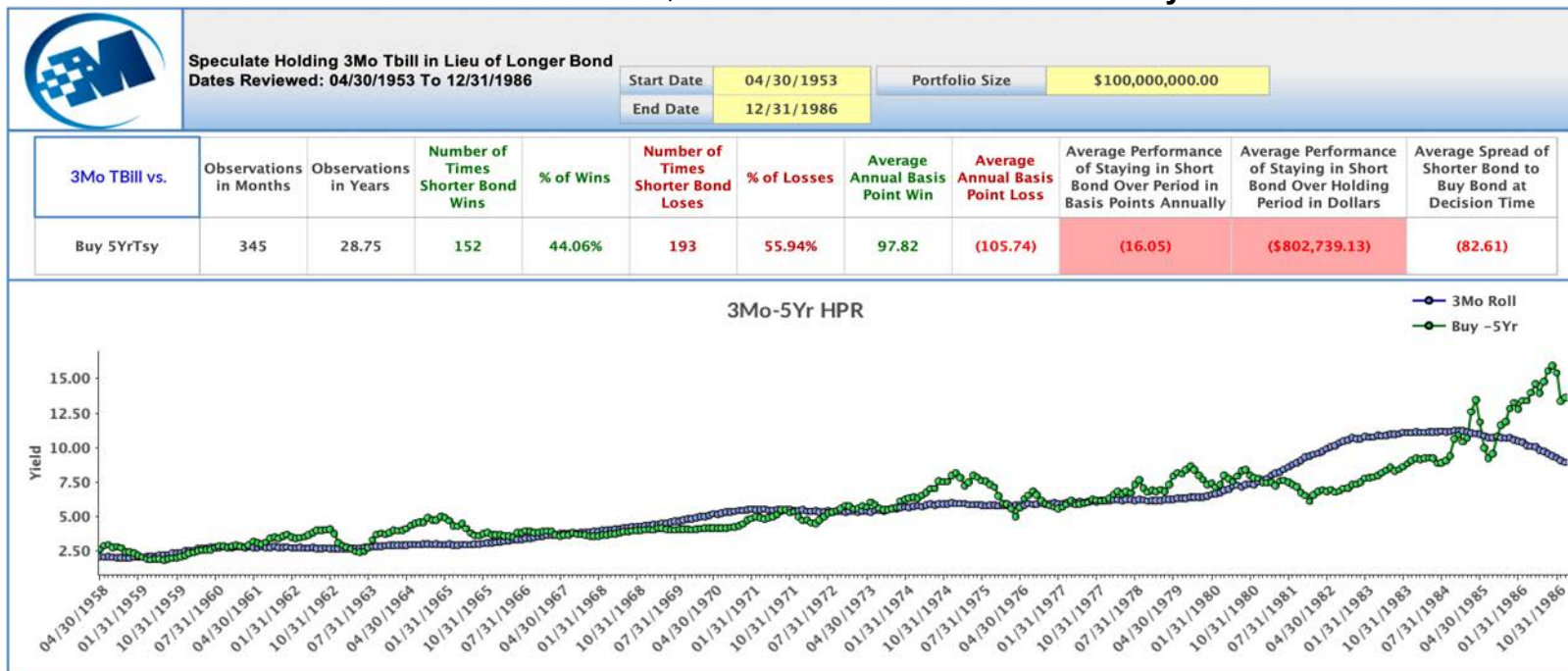
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# Availability Bias Exercise

## The Truth About Flat Yield Curves

Rates: Apr 1953 to Dec 1981  
\$100MM Portfolio

Buy: 3Mo, Roll 3Mo  
Buy: 5Yr



Source: H.15 CMT Data – Federal Reserve

## “Don’t Beat the Market, Be the Market”

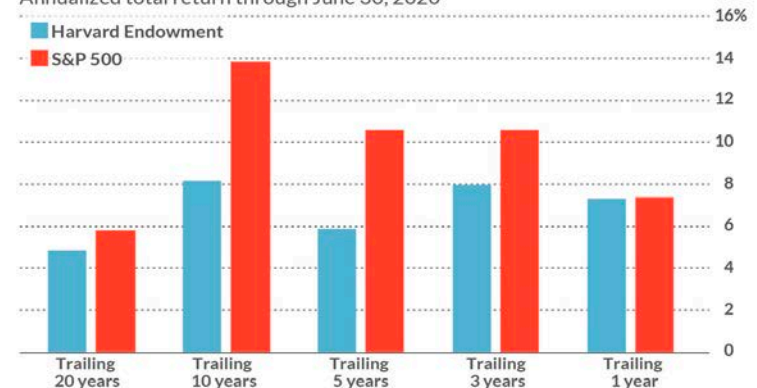
**Harvard Endowment:** Had 230 employees until 2017, Top 6 executives took home over \$40MM in compensation.

*Lost to S&P index by over 100bp over last 20 years and almost 500Bp over past 10 years.*

*Lost to the S&P annually for the last 12 years straight.*

### The best and brightest

Annualized total return through June 30, 2020



Source: Harvard Management Company; The Harvard Crimson; www.HulbertRatings.com

### 5 Takeaway's:

- Performance Persistence is Rare: **Harvard's few moments of glory have been dwarfed by its failures.**
- Overconfidence is an obstacle: **Those who have seen success get complacent and assume they are smarter than they really are.**
- Reversion to the mean is powerful: **Sector outperformance comes and goes and is hard to predict.**
- Many years of skill required to beat luck: **Statistically speaking, you would need many decades to understand if manager is superior.**
- Indexes are hard to beat: **Harvard would have even lost out to a blended portfolio of 60% stocks, 40% US Bonds over last 20 years.**

Source: Marketwatch - "What the Harvard Endowment's Below Average Grade Can Teach You About Index Funds and Your Investments", October 10, 2020

## Can't Beat the Market, So Now What?

- Public entities generally exhibit predictive cash flows in both magnitude and timing.
- This allows public funds to create duration optimized (interest rate risk centric) allocations.
- Allocations should reflect the legal guidance of the investment policy and the desired weights of allowable sectors based on risk/reward and ALM preferences.
- Portfolio construction: Safety (IR Risk, credit), liquidity, diversified, legal, market rate of return.



## Duration, Duration, Duration

*Being invested is more important than the allocation decision*

MODEL WEIGHTING		Cash Proxy	Treasury	Agy Blt	Agy Callable
L0US	OVERNIGHT CASH				
G001	3Mo T-Bill	100.00%			
G0QA	Treasury 0-1Yr		34.00%		
H541	Agy Composite 0-1Yr			32.00%	32.00%
G1O2	Treasury 1-3Yr		36.00%		
G1PB	Agy Bullet 1-3Yr			37.00%	
G1PC	Agy Callable 1-3Yr				37.00%
G2O2	Treasury 3-5Yr		30.00%		
G2PB	Agy Bullet 3-5Yr			31.00%	
G2PC	Agy Callable 3-5Yr				31.00%

MODEL STATS	Annualized Total Return	Annualized Price Return	Annualized Income Return	Annualized Std Dev Total Return	Avg Yield to Worst	Std Dev Yld	Avg Eff Dur	TR Sharpe Ratio	Yld Sharpe Ratio	Main Street Ratio
Cash Proxy	0.639%	0.639%	0.000%	0.248%	0.582%	0.785%	0.235	0.000	0.000	0.000
Treasury	1.432%	(0.413%)	1.784%	1.076%	0.976%	0.731%	1.997	0.737	0.538	0.197
Agy Blt	1.609%	(0.740%)	2.214%	1.006%	1.065%	0.708%	1.998	0.964	0.682	0.242
Agy Callable	1.163%	(0.415%)	1.524%	0.638%	1.117%	0.753%	1.284	0.820	0.710	0.416

Moving from Cash to two duration in Treasuries:

***Pickup approx. 40Bp Avg Yield***

Moving from two duration in Treasuries to two duration in Agency Bullets

***Pickup approx. 9Bp Avg Yield***

Moving from two duration in Agency Bullets to maturity matched Agency

Callables:

***Pickup approx. 5Bp in Avg Yield***

## Strategic Deviations / Market Shifts

Situations arise that merit making decisions that may be different from the past.

- 1) Cash flows change (income drops, outflows increase)
- 2) Transparency issues (COVID-19, lack of information)
- 3) Economic and political risks increase
- 4) Sector/Structure opportunities arise making shifts appropriate

By encompassing institution specific needs and current conditions of the market, we can employ deviations from our strategic allocation to best meet income needs while maintaining duration, credit and ALM/Immunization needs (our overall strategy).

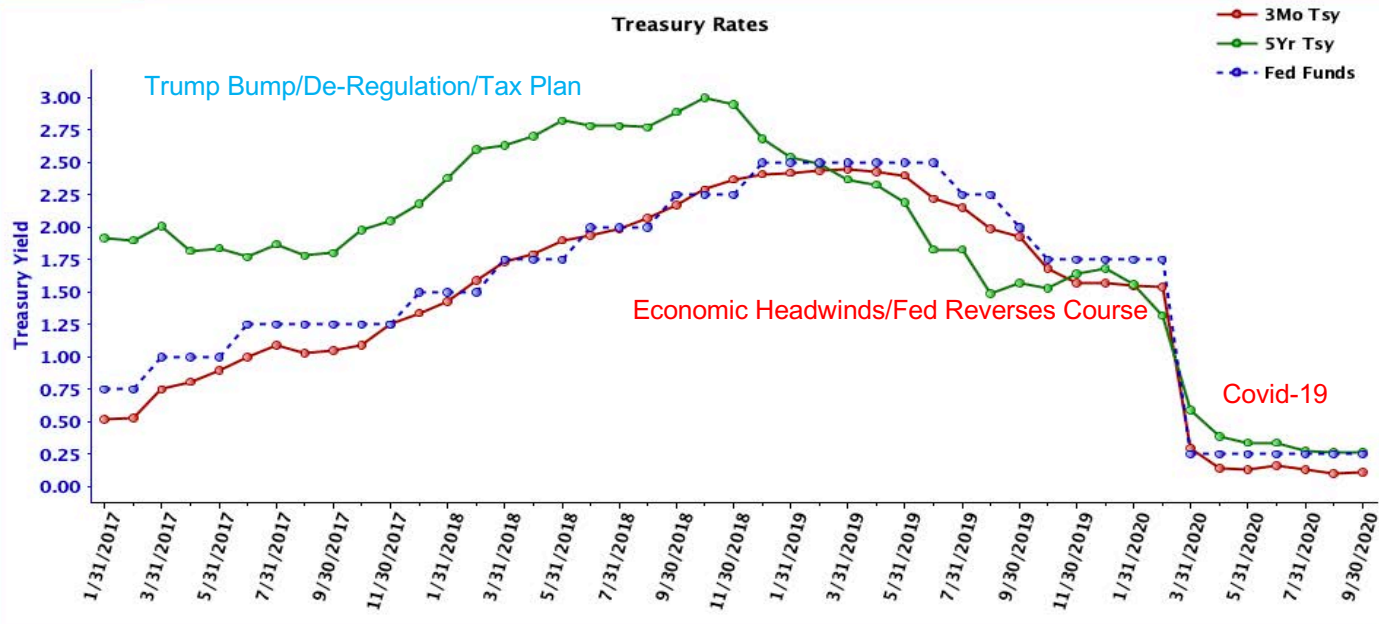
For today's webinar, we will discuss the current environment for Agencies and whether a shift into Callables might make some sense (structure opportunity).



# Where Have We Been: Trump Presidency



**US Treasury Rate Data - Monthly Average**  
 Analysis Dates: Jan 31, 2017 - Sep 30, 2020



**3Mo/5Yr**  
 71Bp Spread - Oct 2018  
 16Bp Spread - Sept 2020

**5Yr**  
 Dropped from 3.09% peak  
 on 11/8/18 to 0.19% bottom  
 on 8/4/2020  
**290Bp drop peak to  
 trough.**

**3Mo**  
 Dropped from 2.46% peak  
 on 3/21/19 to -0.09%  
 bottom on 3/26/20  
**255Bp drop peak to  
 trough.**

Source: H.15 CMT Data – Federal Reserve

## The Struggle is Real!!

### Agency Bullets – Oct 20, 2020

CUSIP	Ticker	Coupon	Maturity Date	Short DES	Amt Issued	Price	Yield To Maturity	MMT Spread	OAS	Effective Duration
3133EMDA7	FFCB	0.160	10/13/2022	1.98NC-FIXED	600MM	100.0106	0.155	1.27	1.220	1.973
3137EAEQ8	FHLMC	0.375	4/20/2023	2.50NC-FIXED	3,000MM	100.4802	0.182	2.68	1.872	2.484
3137EAEY1	FHLMC	0.125	10/16/2023	2.99NC-FIXED	3,000MM	99.6787	0.233	4.76	4.882	2.978
3130A8HK2	FHLB	1.750	6/14/2024	3.65NC-FIXED	105.142MM	105.4099	0.259	3.74	3.390	3.531
3130A2UW4	FHLB	2.875	9/13/2024	3.89NC-FIXED	2,169.135MM	110.0269	0.284	3.96	4.494	3.713
3135G04Z3	FNMA	0.500	6/17/2025	4.66NC-FIXED	5,000MM	100.3111	0.432	11.70	12.901	4.600
3137EAEX3	FHLMC	0.375	9/23/2025	4.92NC-FIXED	5,000MM	99.5685	0.464	13.08	13.736	4.883

### Agency Callables – Oct 20, 2020

CUSIP	Ticker	Coupon	Maturity Date	Short Des	Amt Issued	Price	Yield To Worst	MMT Spread	OAS	Effective Duration
3134GWXJ0	FHLMC	0.220	12/30/2022	2.19NC-11.3Mo-Dq	350MM	100.0000	0.220	7.26	3.28	1.14
3134GWZB5	FHLMC	0.300	10/13/2023	2.98NC-11.7Mo-Dq	300MM	100.0000	0.300	11.46	5.05	1.52
3134GWYD2	FHLMC	0.375	4/8/2024	3.46NC-11.6Mo-Dq	300MM	100.0000	0.375	16.22	7.54	1.75
3134GW5S1	FHLMC	0.375	10/28/2024	4.00NC-24.0Mo-1x	25MM	100.0000	0.375	11.99	6.76	2.34
3134GW3W4	FHLMC	0.410	10/28/2024	4.00NC-24.0Mo-Dq	300MM	100.0000	0.410	15.49	9.43	2.36
3134GWX35	FHLMC	0.450	3/28/2025	4.44NC-17.2Mo-Dq	50MM	100.0000	0.450	15.90	5.94	2.41
3134GW5N2	FHLMC	0.500	10/28/2025	5.00NC-24.0Mo-1x	75MM	100.0000	0.500	15.90	7.74	2.94
3136G45Q2	FNMA	0.530	10/28/2025	5.00NC-24.0Mo-Dq	15MM	100.0000	0.530	18.90	8.78	2.99
3134GW4Z6	FHLMC	0.540	10/27/2025	5.00NC-24.0Mo-Da	100MM	100.0000	0.540	19.90	10.43	2.98
3135G06C2	FNMA	0.600	10/29/2025	5.00NC-12.0Mo-Dq	300MM	100.0000	0.600	25.90	6.47	2.49

Source: MFG Offerings / MaxQ Analytics



## Do Callables Make Sense?

### What Are They:

A callable bond is a bond with an embedded call option(s) that allows the issuer to call the bond at specified periods prior to maturity at a given call price (Par).

The issuer will repay all principal owed and any accrued interest up until the call settlement date.

Call types can range from being callable only once (European) to callable on any business day (American) after the lockout period has expired. The most common callables come with quarterly (Bermudan) calls embedded.

The issuance of callable bonds occurs as the agencies would like some autonomy over what interest they are paying when interest rates decline. The callable bond allows the agency to re-issue the bonds at lower coupons/yields to the investor thus lowering their interest expense.

In order to accomplish this, the issuer must pay the investor a higher level of interest than they would receive with non-callable bonds. The investor needs to be compensated for the risk it could be called away (reinvestment risk).

## Do Callables Make Sense?

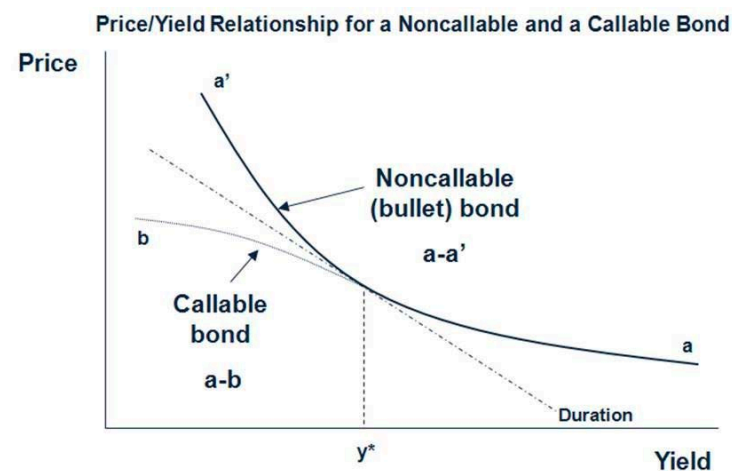
### Pros:

Callable bonds have higher yields associated with them relative to the same credit and maturity non-callable securities.

Callables have less interest rate risk (duration) than non-callable securities. This is because the call option retains value until interest rates have gone up enough to render the option worthless.

- *Example:* a 5Yr Bullet has an effective duration around **4.9** but a 5Yr Non-Call 1Yr with a quarterly call has an effective duration of **2.5**.

Callables would be preferable and outperform their bullet counterparts in flat and rising interest rate environments. These environments make calling the bond sub-optimal for the issuer and therefore the bonds stay in investor hands through maturity.



Where:  $a-a'$  = price/yield relationship for a noncallable bond  
 $a-b$  = price/yield relationship for a callable bond

## Do Callables Make Sense?

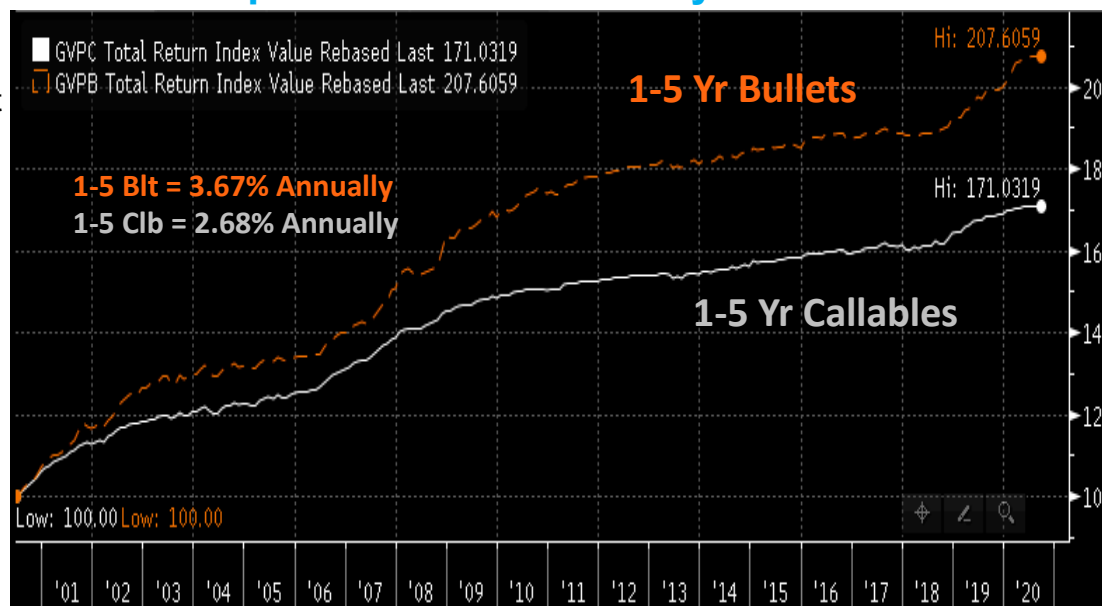
### Cons:

Callable bonds have reinvestment risk associated with them. This risk can be significant as a big drop in interest rates could leave investors re-investing at much lower rates.

Using total return performance, bullets outperform callables under most interest rate environments. *Callables can outperform bullets but require increasing interest rates and rarely outperform significantly.*

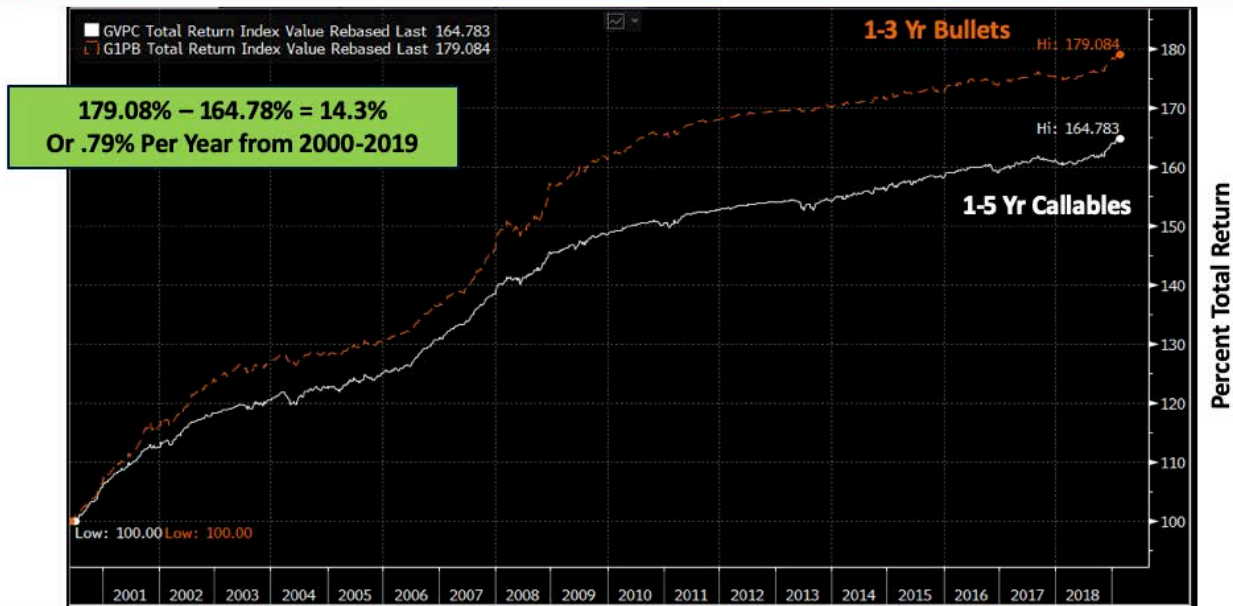
Callables can create havoc with an asset/liability management (ALM) approach to managing public funds. If utilizing an immunization strategy, called bonds can create holes in the “ladder” making it more difficult to stay cash flow neutral.

### June 2000 to Sept 2020 Bullets outperformed Callables by around 1%



Source: ICE/BofA Index Data

## Total Return: 2000-2019 1-5Yr Callables vs. 1-3Yr Bullets



Source: Bloomberg



**Avg Effective Duration: Bullets 1.78 Callables 1.48**



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## Awesome Timing: 1-3Yr Bullets vs. 1-5Yr Callables Total Return



Source: Bloomberg



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Source: FHN Main Street Advisors – CSMFO 7 Habits Presentation



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## Do Callables Make Sense?

### Reinvestment Risk Has Likely Bottomed

The risk of investing at lower rates has likely been bottlenecked by a zero bound on interest rates.

Federal Reserve has deep desire to not let rates go negative. Fed mandate has changed to include “financial stability.”

Fed essentially has created yield curve control through the buying & selling of \$trillions of notes/bonds/MBS. Volatility is at historic lows.

Jim Bianco points out negative rates could be possible if credit markets collapse, election chaos ensues, or we somehow get a repeat of initial pandemic shock.

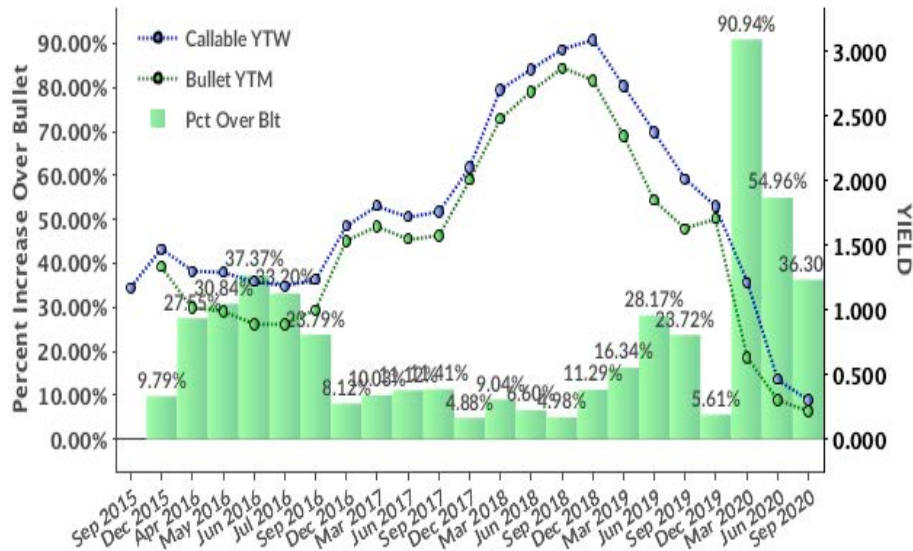
*5Yr bullet on 09/30/20 @ .39 meaning real reinvestment risk even lower*



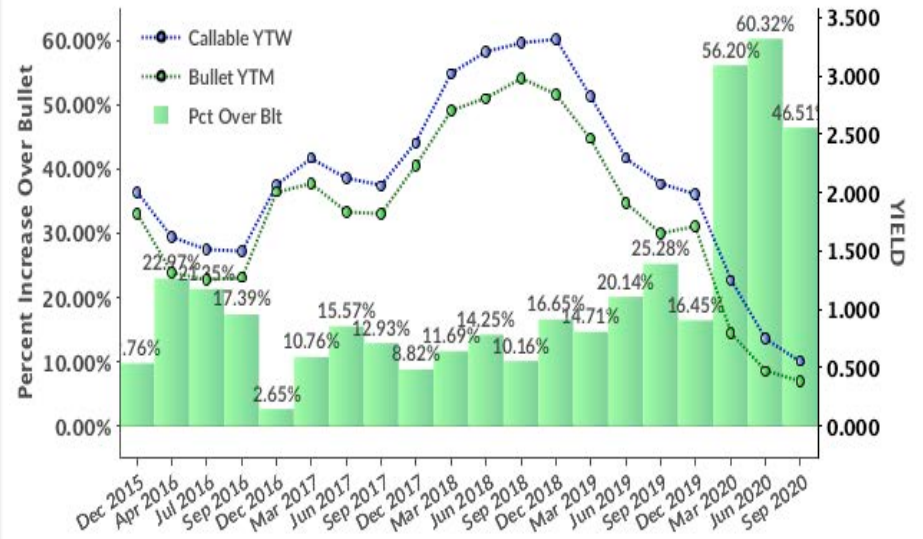
# Do Callables Make Sense?

## Callable Yield as a Percentage of Bullets Has Increased Dramatically

### 3Yr Callable (Max 12Mo Lock)



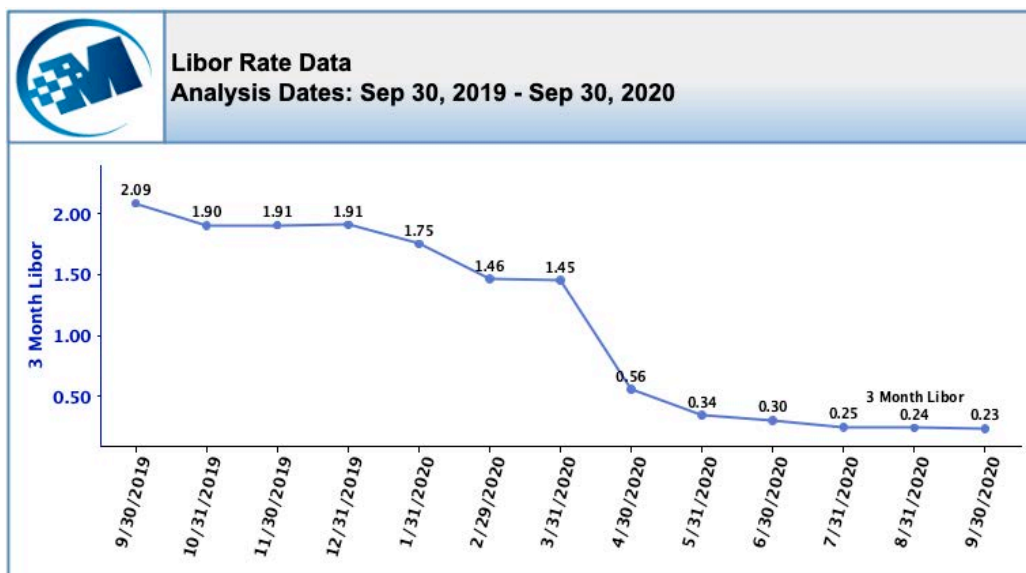
### 5Yr Callable (Max 12Mo Lock)



Source: MFG Offerings / MaxQ Analytics

# Do Callables Make Sense?

## Funding Levels Improve as Libor Declines



	2NC6Mo-Dq	3NC6Mo-Dq	5NC6Mo-Dq	2NC1Yr-Dq	3NC1Yr-Dq	5NC1Yr-Dq
9/30/19	-12.5	-12.5	-11.5	-12	-11.5	-10.5
12/31/19	-21	-20	-19	-20	-19	-18
3/31/20	-4	-1	7	-3	0	8
6/30/20	-3	3	7	-1	5	10
9/30/20	-9	-4	0	-6	-2	3

	2NC6Mo-1x	3NC6Mo-1x	5NC6Mo-1x	2NC1-1x	3NC1-1x	5NC1-1x
9/30/19	-12.5	-12	-11.5	-12	-11.5	-10.5
12/31/19	-21	-20	-22	-20	-19	-18
3/31/20	-5	-1	7	-4	0	8
6/30/20	-4	2	7	-1	4	9
9/30/20	-11	-7	-2	-11	-4	1

Source: FRED – St. Louis Fed / Agency Funding Grids



## Do Callables Make Sense?

OAS measures the issue's average discount rate **spread** over/under every cash flow point on the reference curve in basis points, **AFTER** adjusting for the value of any embedded options.

The OAS Model is calculating the "value" of the option in terms of dollars. In this case, the value was -2.89 in bond convention terms, or \$28.90 per bond in dollars. (4.5NC6Mo @ 2.81). After calculating the Option Value, the Option Free value is shown as 2.133%

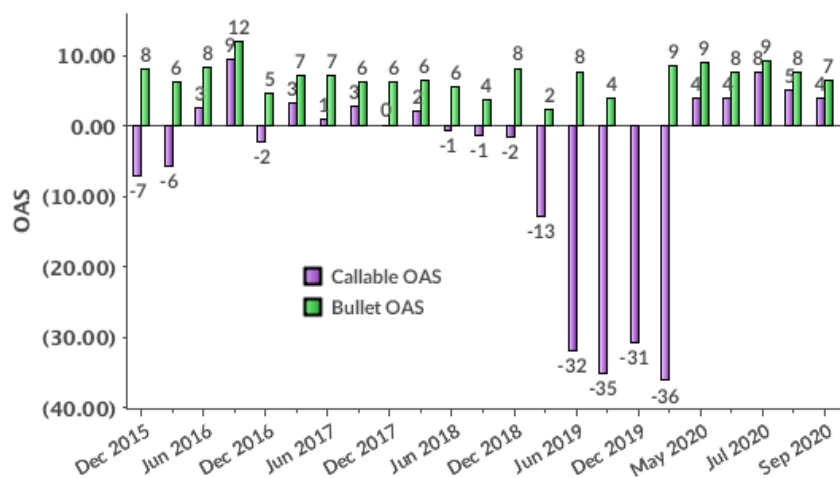
Now, the reality was that bullets in the market weren't really trading at 2.133%, they were actually trading around 2.31% on 4/11/19. Because bullets were **actually trading** higher than the 2.133% the model calculates, bullets will have a better OAS.

OPTION-ADJUSTED SPREAD ANALYSIS					2) Customize		
FREDDIE MAC FHLMC 2.81 10/23 NOT PRICED					Curve	i111 Semi	
Calculate	Price	OAS (bp)	Volatility				
(P,0,V) <input type="checkbox"/> P) 100		0) -17.35	V) 25.79	US On/Off The Run			
Cusip / ID# 3134GTHR7	Option Px Value: -2.89						
Settle 4/23/2019	Bench settle 4/12/2019	Vega: -0.03					
Spread 45.6bp vs2Y	T 2 3/4 03/31/21 Govt	99-25 8 ( 2.354)					
Yield Spread							
{NUM}<GO> for:	OAS	Option	To Call on	To			
3) Call Schedule	Method	Free	10/23/2019	Mty			
10/23/19 100.00	Yld	2.133	2.810	2.810	3m	2.417	
1/23/20 100.00	Sprd	-17.3	36.8	50.4	6m	2.442	
4/23/20 100.00	M Dur	1.47	0.49	4.20	1y	2.410	
7/23/20 100.00	Risk	1.47	0.49	4.20	2y	2.354	
10/23/20 100.00	Cnvx	-1.93	0.00	0.20	3y	2.304	
1/23/21 100.00						4y	2.301
4/23/21 100.00						5y	2.311
7/23/21 100.00						7y	2.399
10/23/21 100.00						10y	2.497
1/23/22 100.00						20y	2.724
...more...						30y	2.927
Model <input type="checkbox"/> L=Lognormal							
Exercise Premium 0.00							
					88) REFRESH		

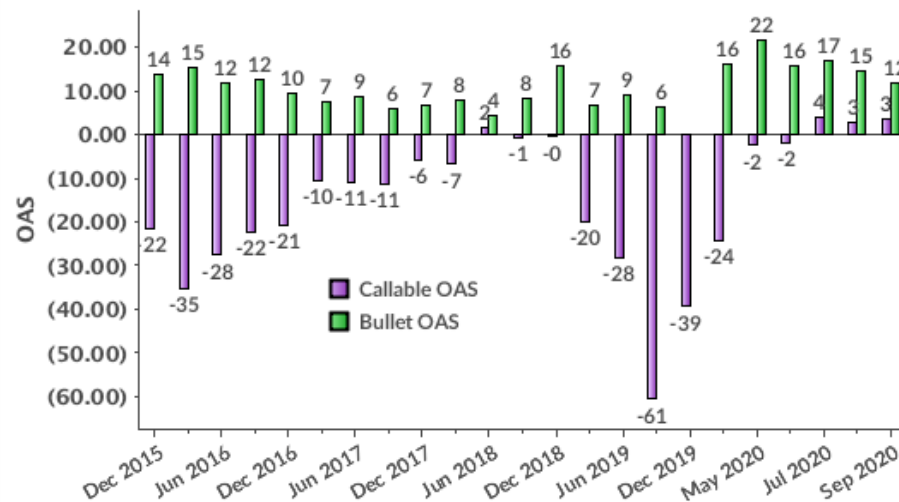
# Do Callables Make Sense?

## Option Adjusted Spread Has Returned to Positive Territory

### 3Yr Callable (Max 12Mo Lock)



### 5Yr Callable (Max 12Mo Lock)



Source: MFG Offerings / MaxQ Analytics

## Do Callables Make Sense?

### Takeaways on Callables:

Reinvestment risk has likely bottomed and reached historic lows in relation to the potential give up relative to buying bullets.

Callable Bonds are exhibiting a much better rate relative to bullets on a percentage of yield basis.

Libor's decline and funding needs have led to improved funding levels and longer lockout / more attractive call options (Annual & Semi-Annual).

Option Adjusted Spread has turned positive and is staying closer to their maturity matched bullet comps.



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