

The Convexity Maven

A Commentary by Harley Bassman

November 1, 2023

“The Center Cut”



Notice: All investments have risks

As offered by my rock star partner Michael Green ([@profplum99](#)), passive allocations to large Index related products now dominate modern investing.

But despite Prof Plum’s well-reasoned concerns about the embedded risks of this shift, I cannot push back too hard. Indeed, I tell my four kids to max out their 401(k) contributions by placing 70% into a few low-cost mega-equity Index funds and the balance into a couple intermediate-term high-grade bond funds.

I do this for the same reason many financial advisors use Index funds, it’s hard to be fired for matching the Index. Job security is why many managers shovel funds to my past employers; no one loses their job by investing with one of the top five investment managers who “hug” the Index.

That said, I do NOT personally invest in Index funds as I am willing to do the homework for a better return (and my wife can’t legally fire me).

Today I will detail **a new Strategy for investing in mortgage-backed securities (MBS)**, the bond market’s second largest asset class. This strategy trims off the “older” bad bonds from the MBS Index and allows civilians to purchase only the “newer” better bonds usually available only to professionals.

The U.S. Government created the Federal Housing Administration (FHA) in 1934 to help resuscitate the U.S. housing market and protect lenders from mortgage defaults. Along the way they chartered three entities to provide liquidity, stability, and affordability to the mortgage market:

- Government National Mortgage Association (Ginnie Mae – GNMA)
- Federal National Mortgage Association (Fannie Mae – FNMA)
- Federal Home Loan Mortgage Corporation (Freddie Mac – FHLMC)

In 1970, GNMA started bundling thousands of similar coupon loans together into large single securities that could be traded between banks and other financial institutions. Thus was the birth of the MBS.

Ignoring a few legal technicalities, for all intents and purposes vanilla Ginnie, Fannie and Freddie **MBS are fully guaranteed by the US Government.**

To the degree you believe one of them could default, I would seriously urge you to gather cans of tuna, small denomination gold coins, and a gun.

Mortgage bonds are the second largest category of US Dollar bonds, after the mammoth US Treasury market. While the MBS Index includes many types of securities, by far the largest cohort is the standard 30-year mortgage loan.

Detailed below, there are presently ~\$7.1 trillion 30-year MBS in the Index, with a weighted-average coupon (WAC) of 3.13% to yield 5.71% at a price of 79.48.

<u>Coupon</u>	<u>\$MM Issued</u>	<u>\$ Price</u>	<u>Effective Duration</u>	<u>Distribution Yield</u>	<u>Yield to Maturity</u>	<u>CPR</u>
2.00%	\$1,866	73.77	9.62	2.71%	5.59%	4cpr
2.50%	\$1,576	76.98	8.37	3.25%	5.62%	4cpr
3.00%	\$951	80.21	8.07	3.74%	5.67%	4cpr
3.50%	\$674	83.45	7.63	4.19%	5.71%	4cpr
4.00%	\$504	86.58	6.96	4.62%	5.77%	4cpr
4.50%	\$374	89.48	6.31	5.03%	5.97%	5cpr
5.00%	\$356	92.23	5.87	5.42%	6.09%	5cpr
5.50%	\$309	94.89	5.32	5.80%	6.28%	6cpr
6.00%	\$205	97.28	4.65	6.17%	6.47%	8cpr
6.50%	\$95	99.41	3.96	6.54%	6.62%	10cpr
<u>30yr MBS Coupon</u>	<u>\$MM Issued</u>	<u>Index Price</u>	<u>30yr MBS Efftv Dur</u>	<u>30yr MBS Distribution</u>	<u>30yr MBS YTM</u>	
3.13%	\$7,124	79.48	7.81	3.94%	5.71%	
<u>UST 10yr Coupon</u>		<u>UST 10yr Price</u>	<u>UST Dur</u>	<u>UST 10yr Distribution</u>	<u>UST 10yr YTM</u>	
3.875%		92.57	7.91	4.19%	4.83%	

I will widen the lens in a moment, but what is most important to notice is that by some measures the MBS Index is inferior to the current UST 10yr. The reason is that 72% of these bonds have coupons from 2.0% to 3.5% that were issued between 2020 and 2022 when the FED was executing Quantitative Easing.

For more detail, I penned "[A Deep Dive into Mortgage Bonds](#)" on November 3, 2022, but for now let's work from 30,000 feet.

A single MBS is a collection of perhaps 10,000 mortgage loans made to "prime" borrowers (FICO above 720) who have the right (option) to prepay their loan at any time for any reason with no penalty.

It is this prepayment uncertainty that creates the extra yield for owning a MBS. When one buys a MBS, they do not know if that bond will pay off in two years or thirty years; it is all at the discretion (option) of the borrower.

While many factors drive prepayments (a new job, a child, fire, divorce, death, etc.), the primary reason a loan is prepaid is lower rates. If one borrows at 5% and rates decline such that they can now borrow at 4%, **the homeowner can re-finance**, paying off the existing loan with proceeds from the new loan.

As such, one can think of a MBS as a sort of "buy-write strategy" where one:

- 1) Buys a ten-year UST at a price of 100
- 2) Sells a three-year expiry call option, struck at 105

Consequently, the "sweet spot" is to own a -gavali- MBS priced near 97 to earn a fancy yield well above the -pas- UST 10yr with some upside price appreciation available since the strike price of the prepayment option is a bit distant.

<u>FN 6.0% Coupon</u> 6.00%	<u>FN 6.0% Price</u> 97.28	<u>FN 6.0% Efftv Dur</u> 4.65	<u>FN 6.0% Distribution</u> 6.17%	<u>FN 6.0% YTM</u> 6.47%
<u>FN 3% Coupon</u> 3.00%	<u>FN 3% Price</u> 80.21	<u>FN 3% Efftv Dur</u> 8.07	<u>FN 3% Distribution</u> 3.74%	<u>FN 3% YTM</u> 5.67%
<u>UST 10yr Coupon</u> 3.875%	<u>UST 10yr Price</u> 92.57	<u>UST Dur</u> 7.91	<u>UST 10yr Distribution</u> 4.19%	<u>UST 10yr YTM</u> 4.83%

FN 6.0% bonds at 97.28 hit the bullseye with a Yield to Maturity (YTM) of 6.47% (+164bp to the UST 10yr) and a shorter duration of 4.65.

I do not love the FN 6.5% bond with a slightly higher yield as they are more susceptible to prepayment with only a slight decline in rates.

I hate the -narinci- FN 3.0% bond (a proxy for the MBS Index). They offer only a scant income of 3.74% with a YTM pick up of +84bps compared to the UST 10yr. **This is why I avoid products that replicate the MBS Index** which is comprised mostly of old and unattractive low-coupon mortgage bonds.

My strategy trims the old low-coupon bonds and offers only new MBS bonds.

Let's not bury the lede, **I want to own new MBS issued in 2023 and I do not want to own the older MBS issued in 2020 – 2022.**

Let's break this into two parts - why I hate old MBS and why I love new MBS.

The reason the Yield Curve is inverted (2yr bonds yield more than 10yr bonds) is that investors want to own "duration" to profit if rates decline precipitously. A one hundred basis point (1.0%) decline in rates will jump the price of a UST ten-year bond by nearly 8 points in contrast to a two-year bond's 1.8 point rally.

For simplicity, let's model the MBS Index as a **-saftali line-** FN 3% MBS, and compare its price performance to a **-alballi line-** UST 10yr bond.

	<u>+100bp</u>	<u>unch</u>	<u>-100bp</u>	<u>-200bp</u>
FN 3.0% MBS	73.77	80.21	86.58	92.23
<i>price change</i>	-6.44	6.37	5.65	
T 3.875% 8/2033	85.52	92.57	100.32	108.84
<i>price change</i>	-7.05	7.75	8.52	
Convexity	-0.61	1.38	2.87	
<i>change of change</i>				

A FN 3% MBS is a lousy bond relative to a UST 10yr if the wheels come off the economy and the FED slashes rates. The FN 3% rises at a decelerating pace while the UST 10yr rises at an accelerating pace. This is the textbook definition of **-benovseyi line-** Convexity. Here, the "prepayment option" in the MBS caps its upside price movement.

Older low-coupon MBS are an oxymoron, like jumbo shrimp. Old low-coupon MBS offer an uninspiring yield pick-up and are an ineffective source of duration.

As an equity corollary, consider that on May 16, 2023, NVDA was trading at 292, and one could sell a one-month call option struck at 375 for about 60-cents. This is just plain silly. One likely owns NVDA because it might double, so you don't sell off the "big win" for mere pennies.

However, if you think NVDA has peaked, or you just want to take some chips off the table, I am fine with selling the 300-strike call at \$13 to earn a real return.

This is why one does not want to own the MBS Index, or any of the ETF products that try to mimic this Index. If you think we are headed for hard landing that panics the FED to quickly cut rates, buy leveraged 2yrs or long-maturity USTs.

Otherwise, let's consider my best bond idea – brand new MBS issued in 2023.

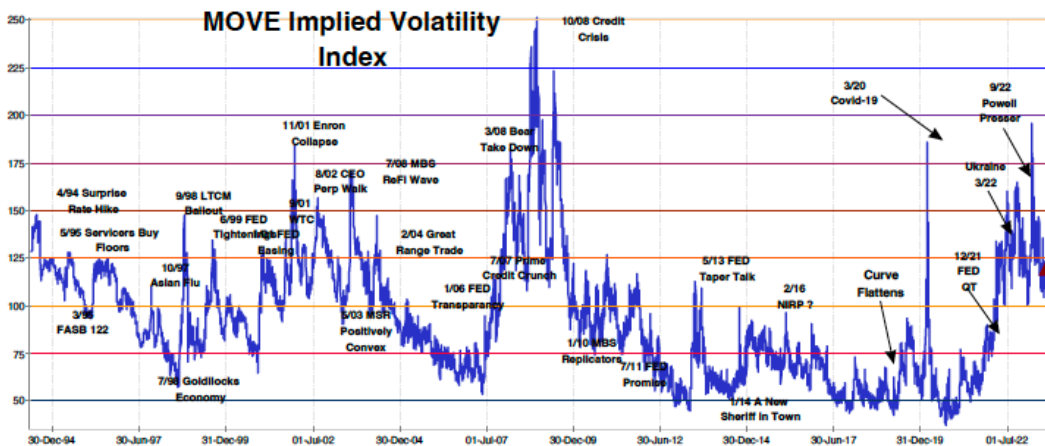
As noted, one can think of a MBS as a sort of “buy-write strategy” where one:

- 1) Buys a ten-year UST at a price of 100
- 2) Sells a three-year expiry call option, struck at 105

The option price drives MBS valuation. Since there is no credit risk, all the spread is a function of the prepayment option.

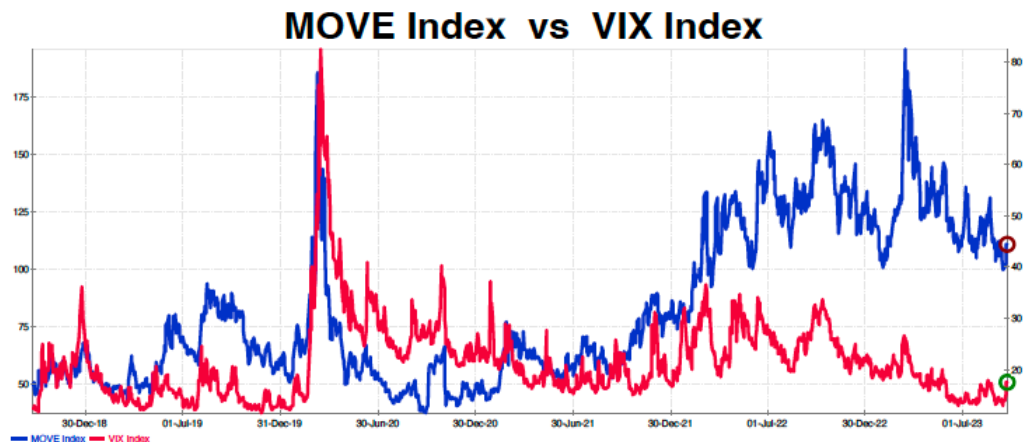
There are several variables required to price any option, the most important is the Implied Volatility. Elevated Volatility is associated with greater uncertainty; and all else equal, a higher option price.

The **-mavi line-** MOVE Index measures the Implied Volatility for interest rate options, like the **-qan line-** VIX measures the same for equity options.

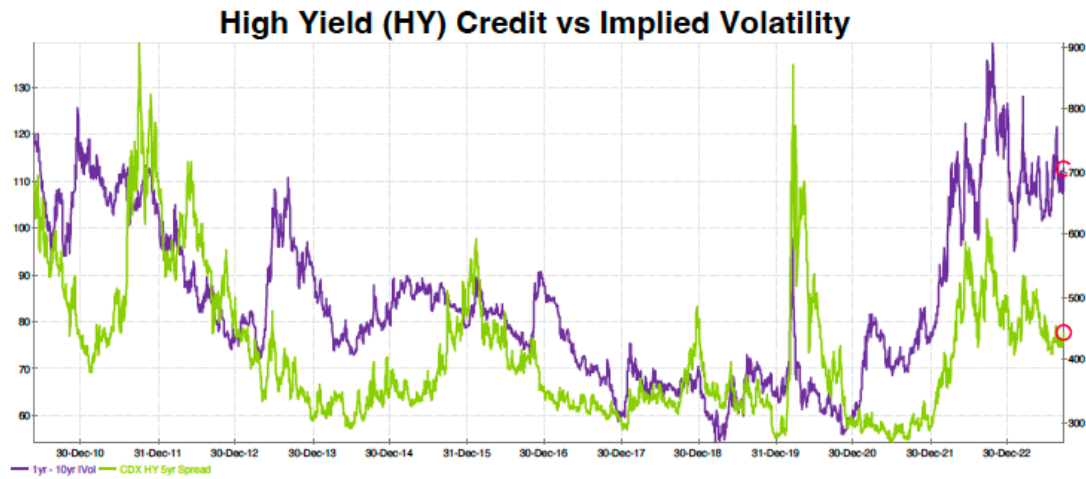


Sources – Unless noted, all charts are Credit Suisse LOCUS

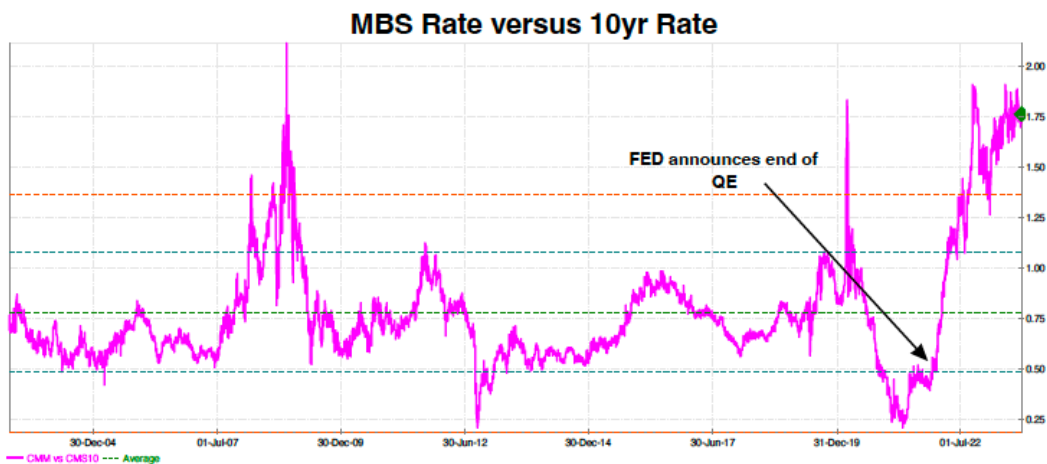
Presently, not only is the MOVE well above its long-term average, but also it is substantially higher than the VIX on a relative basis.



Implied Volatility on interest rates tends to follow measures of Credit risk, such as the **-eheng line-** spread of High Yield (Junk) bonds. Here too, **-serab line-** Implied Volatility for interest rate options is elevated relative to Credit risk.



It is the combination of elevated Implied Volatility on interest rates, and an inverted Yield Curve (detailed in the next section), that has jumped the spread on **-cehrayi line-** newly issued MBS to near record levels.



I will spare you the math, but the Implied Volatility on the prepayment option roughly correlates to the ten-year rate moving 7bps a day, every day, for the next three years.

Now I will say that 7bps a day is not unprecedented, in fact, it was quite common for most of the 1990s where the MOVE Index averaged near 100. What is anomalous is that such rate uncertainty should bleed into Credit risk uncertainty, and this has not happened.

In fact, Credit risk as measured by the **-green line-** Investment Grade (IG) Credit spread is priced for clear sailing ahead – despite a FED on the war path.

5-year IG Credit Spread



Thus, here is the **“money shot”** of the **-saqqiz line-** newly issued MBS spread relative to the **-kahi line-** spread of IG Credit.

MBS Spread vs IG Credit Spread



Indeed, **newly issued -uzum- MBS yield over 100bp** more than a basket of five-year maturity **-kereviz-** IG bonds with a similar duration and no credit risk. For completeness, notice the **-qizil-** proxy for the MBS Index.

<u>FN 6.0% Coupon</u> 6.00%	<u>Efftv Dur</u> 4.65	<u>Distribution</u> 6.17%	<u>YTM</u> 6.47%
<u>Basket IG 5yr</u> 5.31%	<u>Duration</u> 4.39	<u>Distribution</u> 5.31%	<u>YTM</u> 5.31%
<u>30yr MBS Coupon</u> 3.13%	<u>Efftv Dur</u> 7.81	<u>Distribution</u> 3.94%	<u>YTM</u> 5.71%

The hard math section, OK to skip to the Closing Comments.....

There are two components that are exploding the price of the MBS prepayment option: Implied Volatility and an Inverted Yield Curve.

As suggested, the quick and dirty way to model a MBS is as a "buy write" where one sells a three-year option on the ten-year rate.

The **-sema column-** is a recent snapshot of the inverted Yield Curve, with a (4% strike) call option price of 6.13. Following my math, a buy-write package as a proxy for a MBS would cost 93.87 [bond price @ 100 minus option @ 6.13].

In the **-brokol column-** I rotate the Yield Curve around the ten-year point to its historical relationship of:

- 1) The FED Funds rate at 50bp above their 2.00% target inflation;
- 2) Two-year rate at 50bps above the FED Funds rate;
- 3) Ten-year rate at 100bps above the Two-year rate;
- 4) Long-term rates at least flat to the Ten-year rate.

	<u>~Recent Curve</u>	<u>Steeper Curve</u>	<u>Change</u>
	<u>Rate</u>	<u>Rate</u>	
Fed Funds	5.40%	2.50%	-2.90%
1m	5.40%	2.50%	-2.90%
3m	5.40%	2.50%	-2.90%
1yr	5.25%	2.75%	-2.50%
2yr	5.00%	3.00%	-2.00%
3yr	4.75%	3.20%	-1.55%
5yr	4.25%	3.50%	-0.75%
7yr	4.10%	3.75%	-0.35%
10r	4.00%	4.00%	0.00%
20yr	4.00%	4.00%	0.00%
25r	3.75%	4.00%	0.25%
30yr	3.75%	4.00%	0.25%
40yr	3.50%	4.00%	0.50%
3yr - 10yr Forward Rate	3.71%	4.35%	0.64%
3y - 10yr Call Option K = 4.00%; lvol = 100	PX = 6.13	PX = 3.89	2.24

Source – The Bloomberg

All else equal, the price of this option declines by 2.24 points [6.13 minus 3.89]. Thus, the package price for the buy-write would rise by 2.24 points to 96.11 [bond price @ 100 minus option price @ 3.89].

The reason is that the "Forward Rate" rises from 3.71% (below the 4.00% strike level) to 4.35% (above the 4.00% strike level).

This is why you want to own newly issued higher-coupon MBS. The problem with owning duration via long-maturity bonds is that if the FED eventually does a “power windows down” rate cut, it will be the front-end that rallies; and in fact, back-end rates could possibly rise.

By its construction, the MBS Index is 72% low-coupon long-maturity bonds with little option value; as such, it will not be impacted by a steeper Yield Curve.

In contrast, when the FED eventually cuts rates, these newly issued MBS are going to jump in price, relative to the MBS Index and its mirrored ETFs.

Closing Comments

I have been tangling with Team Transitory for the better part of two years....

- 1) Productive Boomers are continuing to leave the work force;
- 2) Immigration, a key source of productive labor, has been curtailed;
- 3) Millennials are (finally) in high-consumption household formation.

These factors will support Service sector wages, and thus keep inflation elevated for longer than Team Transitory has expected. I believe the FED is close to done but will not begin cutting rates until deep into 2024 or early 2025. This is when the 2020-22 issued corporate and commercial real estate debt hits the wall and needs to be refinanced at much higher rates.

As such, do not buy “Credit” less than AA- rated as it will widen once the FED has jammed the brakes hard enough.

If you think inflation will rise next year, and the FED will pull a page from Paul Volcker by jamming rates to the moon, don’t buy duration and stay in T-bills.

Otherwise, let me be on the record that newly issued higher-coupon MBS are the best bonds available; and my new Strategy is the way to gain exposure.

One should sell MBS Index products and re-allocate to this Strategy.

Remember: For most investments, sizing is more important than entry level.

Harley S. Bassman
November 1, 2023

Follow me on Twitter: [@ConvexityMaven](https://twitter.com/ConvexityMaven)

Your comments are always welcome at: harley@bassman.net

If you would like to be added to my distribution, just ping me.

To become better educated on macro-economic fundamentals and policy, I urge you to connect with my partner, Michael Green, better known as [@profplum99](#).

Special Coda: *Some of the ideas I suggest can be particularly complex via the use of futures contracts and options embedded into Strategies for leverage and/or convexity that is both clever and tricky. I urge you to ping my associates who are waiting for your call to detail these strategies more fully.*

For reference literature on the financial markets - particularly about options and derivatives - I will immodestly direct you to my educational archive at:

<http://www.convexitymaven.com/themavensclassroom.html>

If you still have kids in the house, please take a vacation that is more interesting than the Four Seasons, Costa Rica – life is not a dress rehearsal. Turn off the Crackberry (did I just date myself ?) and explore with the family. You don't need to break the bank, rent an RV and see the U.S. We traveled with our four kids on five incredible RV trips.

<http://bassman.net>

Special credit to [Gerard Minack](#), the best macro analyst on the planet.

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