March 6, 2025

Lies that your fixed income Portfolio Manager tells you…*

** there are some details glossed over and simplified in the discussion below, but we don't consider them to be lies.*

It looks so simple, that report that your fixed income portfolio manager sends you. Market value, return, yield-to-worst, duration… But if you own mortgage-backed securities, those yield numbers and duration numbers almost certainly involve a bit of guessing. Honestly, nobody knows what your yield-to-worst and duration really are. And this happens to present a fantastic investment opportunity at the moment. The market is rewarding investors for taking on this uncertainty. It is striking that this opportunity exists at the same time that the reward is so small for taking on corporate credit risk.

You may recall from a very boring Finance class that duration is important because it tells you how sensitive a bond's price is to changes in interest rates. If the duration of your portfolio is 6.00, and interest rates go down 1.00%, the value of your portfolio goes up 6%. If you weren't asleep at that point, you may recall your teacher mentioning something called convexity that made that relationship not true. Let's pretend that bond convexity doesn't exist and let's concentrate on the duration number. In a very important sense, duration is simply the average of the number of years until you get your money back. Less simply, it is the weighted-average number of years until you get the present value of your money back.

Now back to where the lies come in. Let's take a look at Fannie Mae AD5491, a pool of 49 residential mortgages that currently sum to $5,189,033 in outstanding principal due. The original size of the pool in 2010 was $84,513,287 and there were 519 loans in the pool.

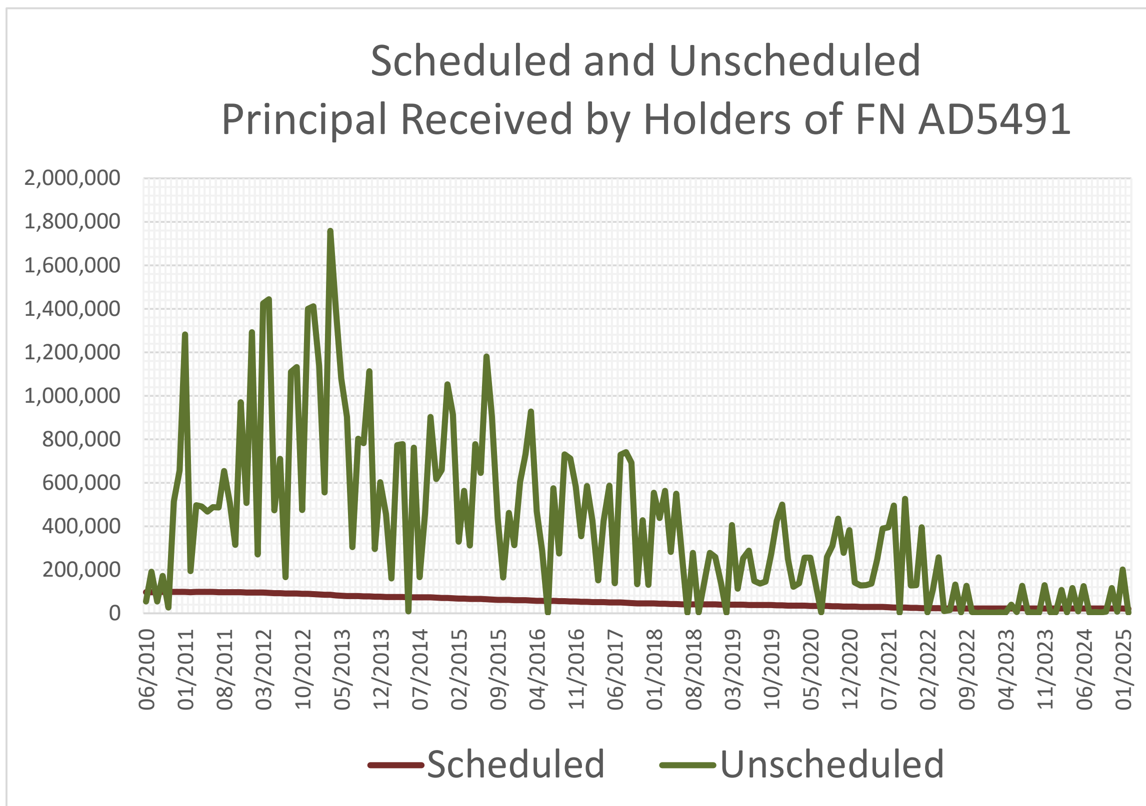
- 11.97% of the mortgages were for homes in California, 7.03% in Florida, 6.57% in Illinois, and so forth.
- 84% of the loans were to refinance existing mortgages, 16% were for home purchases.
- The average FICO score was 732.
- The average loan-to-value was 77% at issuance.
- The weighted average mortgage loan rate is 5.322%.

Holders of this bond will receive a monthly coupon of 5.0% on the outstanding amount. In the last month, bondholders, as a group, received $22,454.00 in principal and $21,714.53 in interest, based on the prior month outstanding balance ($5,211,487.33 * 5.00% / 12).

Think about the 49 households with mortgages in this pool. Each month, some number of them will decide to sell their houses. When the sale closes, the underlying mortgage in our pool will get paid off and the proceeds will be paid to bondholders. If mortgage rates happen to drop significantly below 5.322%, many of the mortgages will be paid off and the proceeds will be paid to our bondholders.

To see what happens as rates fluctuate, the chart below shows the scheduled principal as a nice straight, decreasing line as people pay their mortgages each month. The spiky line is the unscheduled principal payments that bondholders have received as people have sold their

houses and refinanced their mortgages (there is also a little bit of people paying down their mortgages faster than scheduled).



Source: Bloomberg

If mortgage rates do drop significantly below 5.322%, the 49 mortgage holders will presumably rush to refinance. The rush to refinance will probably depend on how much lower the rates are. If we see rates at 2%, the rate of mortgage prepayments will be limited only by the ability of the mortgage industry to handle the rush of business.

The important point is that the decision each month of those 49 mortgage holders determines the duration of this bond. A commonly used system calculates the duration of this bond as 4.41. If each of the 49 homeowners were to close on the sale of their home in the same month, bondholders will receive all of their money back. That means the duration of the bond would have really been, on the day before bond payments are received, 0.00274 (1/365). But bondholders thought it was 4.41. Surprise! Your bond was priced at $101.41, because you thought you would be receiving a 5% coupon every month for several years, but nope, you received $100. Sorry about that sudden loss on your bond.

But on the other hand, think about if you owned a pool of mortgages that paid you a coupon of 3% every month. Those bonds right now have an average underlying loan rate of 3.77%. The price on those right now is about $87.125. The market convention assumes that those bonds have a duration of 7.57. If mortgage rates suddenly drop to 2.50%, bondholders will get a sudden rush of payments at $100.00 and make a jaw dropping amount of money in one month for bonds that were priced at $87.125. Throwing a wrench into this joyful celebration, this 4.00% drop in

mortgage rates might be accompanied by a sudden 30% return on the 10-year US Treasury bond that had roughly the same duration as the 3% Fannie Mae MBS. There would be much tearing out of hair and gnashing of teeth by portfolio managers who bought the 3% Fannie Mae MBS and not the 10-year US Treasury.

What your fixed income portfolio manager can truthfully tell you is that if you buy a brand-new Fannie Mae MBS, the duration is somewhere between 0 and 11. If nobody in the pool ever sells or refinances their home, the duration is about 11. The actual duration depends on when and if homeowners sell their house for a new job, sell for a change in family size, sell for a change in family circumstance, or refinance their mortgage because mortgage rates have plunged. But in a rate plunge caused by a recession, some people won't be able to get a new mortgage because they're unemployed.

Due to the unwillingness of financial system programmers to offer ¯_(ツ)_/¯ as an option under "duration", bond market participants must continue to pretend to believe a lie. A Google search for "William Shakespeare quote on uncertainty" offers this appropriate gem from Shakespeare's *Comedy of Errors*: "Until I know this sure uncertainty, I'll entertain the offered fallacy."

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