



The MBS “Income Factor”

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Factor based investing has become commonplace in Equities, with ETFs available for many factors. More recently, numerous fund managers have also started using equity factors, such as “Momentum”, “Value”, “Size”, “Quality”, “Yield” etc. for Fixed Income portfolio construction and investing.

Since 1994, we have been using what would today be called an “Income Factor” to identify MBS with high returns, and have built an MBS strategy that uses this factor for portfolio construction.

Our core insight has been that MBS is not a “Fixed Income” product, but is a “Variable Income” product.

What is “MBS Income”?

For many market participants who have been trained to believe that all bonds are “Fixed Income”, the concept of MBS as “Variable Income” is foreign, to say the least. **This insight, that MBS are “Variable Income Securities”, is arrived at by deconstructing the core concept of Total Returns.**

Total Returns are typically attributed to two factors - Return from Price Change and Return from Income. For most bonds, such as corporate bonds or US Treasuries, the Return from Income is correctly understood to be a function of coupon interest and price, and is approximated by “Yield”. Variation in returns for Fixed Income bonds usually arise from differences in Return from Price Change, and most investors focus on Price Change, either through active duration management, or by looking for spread compression.

MBS returns derive from many additional factors besides the returns from coupon or price change. The cashflows in MBS are not stable, either creating additional return, or offsetting return from interest, as these additional factors impact MBS cashflows dramatically, both positively and negatively.

Many investors think that prepayments and credit losses are the extent of cashflow variation in MBS, and much effort is expended in MBS Research to identify and model the loan characteristics that impact MBS prepayments or borrower credit. Examples of such characteristics are loan sizes, FICO scores, geography, type of loan, loan size, LTV, size of servicer, shelf name, shelf type (bank or third party originator), seasonality, etc.

I spent much of the early 1990s as head of the MBS Strategies group at Nomura trying to improve MBS models and explain MBS return volatility through identifying and modeling additional factors, as MBS models were not good predictors of MBS returns. As an industry, we did not (and still do not) even have consensus on the duration of our benchmark Agency MBS

duration. It is during this period that I had the epiphany that MBS is not Fixed Income, and developed the framework and tools to systematically identify MBS Income.

Single factor analysis is easily understandable – for example, fast prepayments on a discount bond will result in higher returns from cashflow. Usually most single factor events get priced in by the market, and so discount MBS like POs will go up in price as interest rates decline (and prepayments are expected to speed up), and IOs will appreciate when rates rise and prepayments are expected to slow.

Unfortunately for most MBS investors who view MBS with a Fixed Income lens, there are many other factors that distort MBS cashflows, and thus returns from cashflows. These make MBS risky when viewed as corporate bond substitutes. **More importantly, these factors interact with each other at the return level to create unstable cashflow events and volatile returns.** Factors such as severities, call exercises, yield maintenance payments, subsequent recoveries, settlements, changes in servicing, other cashflow shortfalls (from servicer misbehavior, curtailments, rate modifications, loan forgiveness, loan extensions), etc., all change the return performance of MBS.

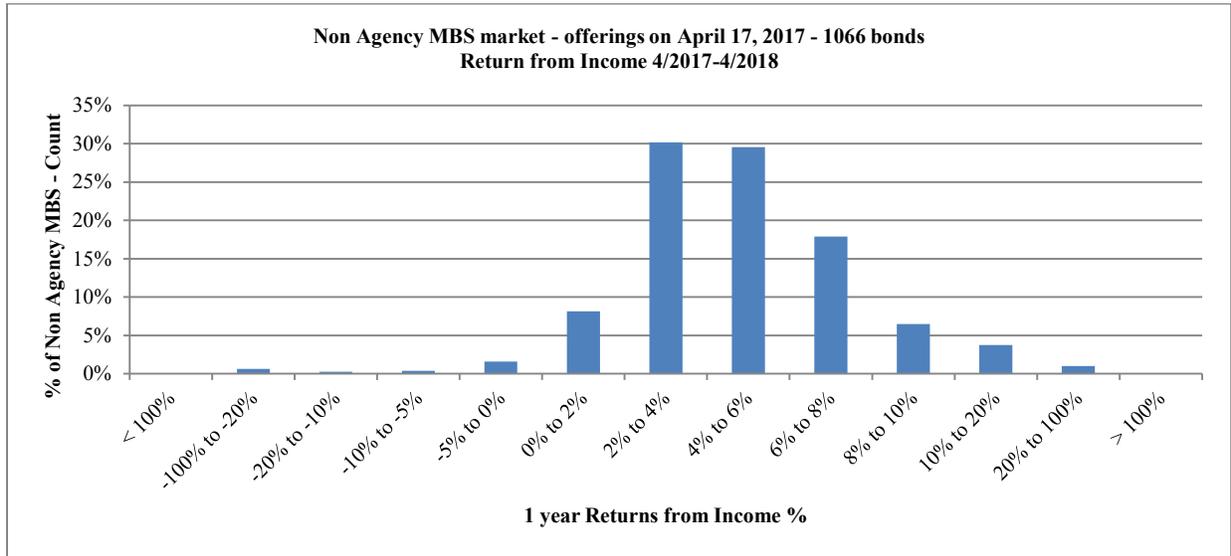
As an example of such interactions, there are many discount bonds that do not receive sufficient cashflow to generate much income, in spite of fast voluntary prepayments from many loans in the deal, as other loans in the same deal are defaulting with high severities at the same time, reducing the cashflow and offsetting the return from prepayments. Case Study 2 below is an example of such a bond. Such interactions make bets on single factors non-durable. One could, in theory, compute the attributions of returns for each of these additional factors, not an easy task, and one that I have found is not of much use for making investment decisions.

To allow for comparison to other Fixed Income and Equity Products, we simplify this factor attribution process into the two main attributes of Total Return. There are two steps. First, we isolate the Return from Price Change from the Total Return of the bond in a given period, which is easy to do. **The remaining return is thus the Return from Income for MBS** (we previously called this “Return from Cashflow”), **and is the aggregate remaining return from the netting of the return attributions from the multiple factors that impact the MBS’ cashflows during a given period, after subtracting the Return from Price.**

MBS Income Returns vary in time for the same bond, and also vary between two similar bonds that markets (and models) view as substitutes, making similar bonds have very different returns in a given period. Below, in Case Study 1, we show some examples to illustrate both these points.

There is a very wide range of Income available in MBS. We have found that the resulting distribution of Income available in secondary market MBS is similar at different points in time. The following chart shows the realized 12 month Income returns for all Non-Agency MBS (“NA”) offered on a random day in the MBS secondary market (we have systems to aggregate all

dealer offerings), and is indicative of the MBS Income distribution available in the MBS market on almost any day.

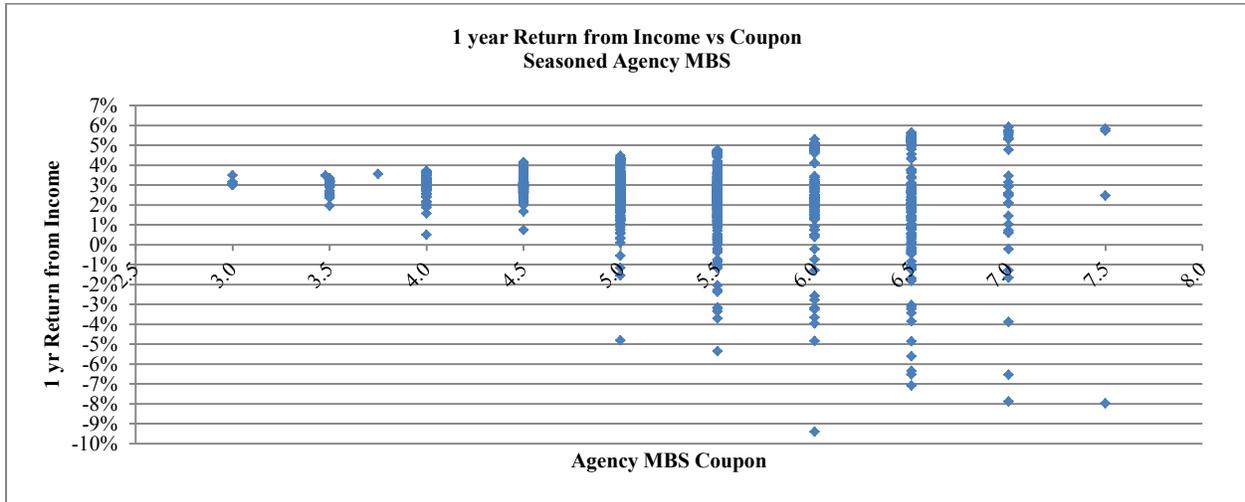


Approximately 60% of MBS are within striking range of the “market yield” of 3% to 4%, and deliver what I call “Average Income”. **More importantly, there are a significant quantity – ~30% - of bonds available in the right tail of the distribution, with significantly higher Income.**

The next graph shows the distribution of Income for Agency MBS. There were over 17,000 Agency MBS pools offered on 2/27/18, too many to be analyzed with our limited data Bloomberg license – we would hit our monthly data limit immediately. We arbitrarily limited our analysis to 1484 seasoned 30 year MBS pools, with maturities (“WAMs”) ranging from 225 to 260 months, and prices ranging from \$96.8 to \$121.8. Coupons ranged from 3% to 7.5%.

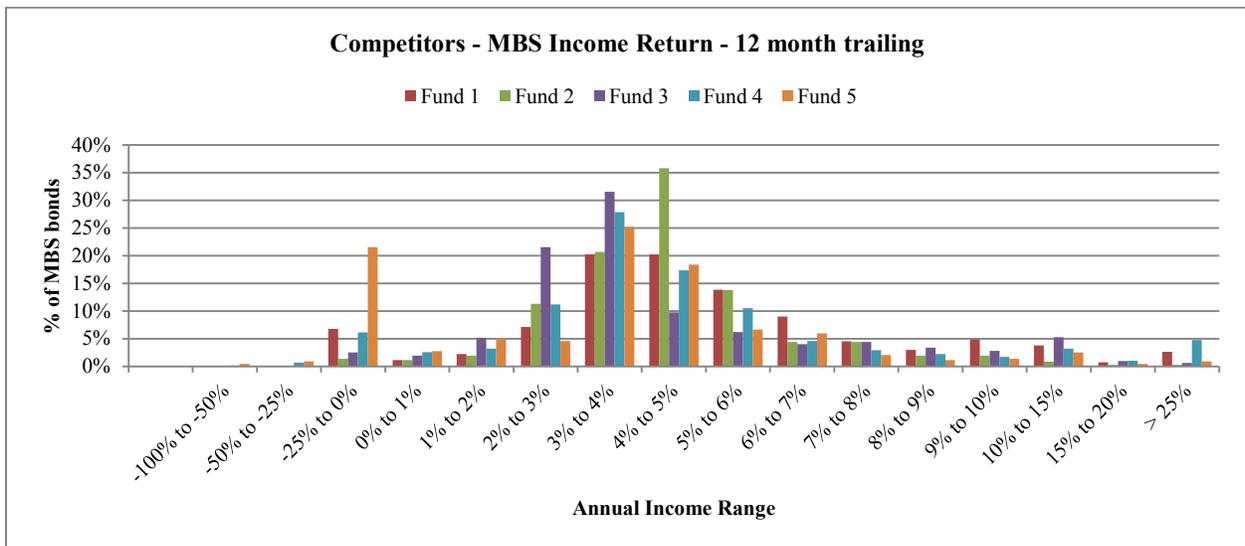


High Income can be found in Agency MBS too! The next graph shows that there is no consistency of Income by coupon in Agency MBS. If anything, Income risk increases as coupons go up and durations shorten.



We focus on the Non-Agency MBS markets as we are seeking the highest Income possible, and Non-Agency MBS have the widest distribution of Income within the various MBS sub-sectors.

We believe that most MBS investors are not aware of this Income distribution, and construct MBS portfolios with an Income distribution that mostly resembles the market’s Income distribution, not significantly different than random purchasing of bonds. The following graph is from our [March 2019](#) newsletter, where we performed an analysis of the MBS Income profile of the MBS holdings of five different MBS or Income funds, ranging in size from \$700mm to \$118b.



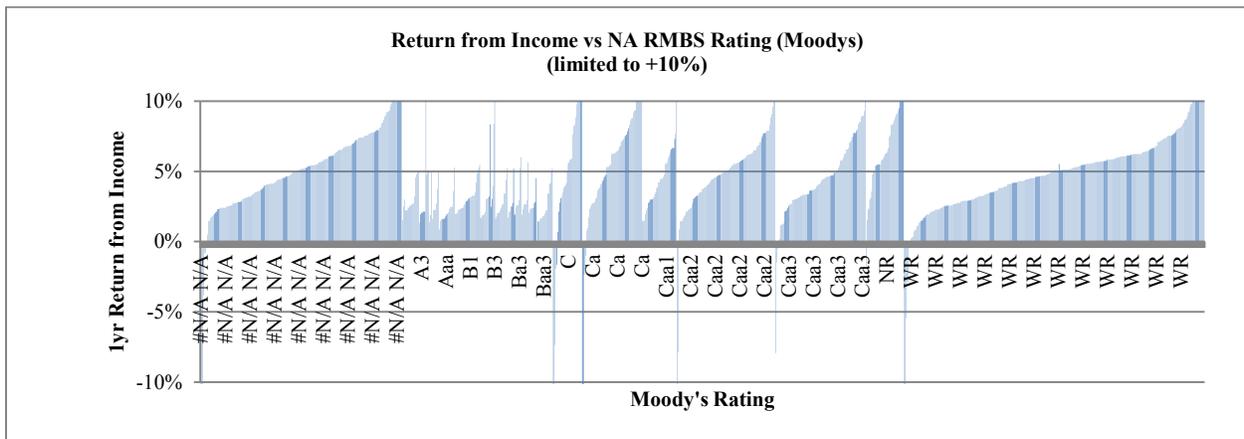
Please reread the [March 2019 newsletter](#) for more details about our analysis of these portfolios. In our opinion, none of the five portfolios analyzed are based on the Income Factor, and four of the five chase income and yield through significant bets on Credit leverage. This is also evidenced in the Income distribution above – the quantity of bonds in the negative Income buckets reflects credit losses. The following table shows the extent of Credit-levered MBS used by the various funds to generate Income, and the average Income and coupon of each fund.

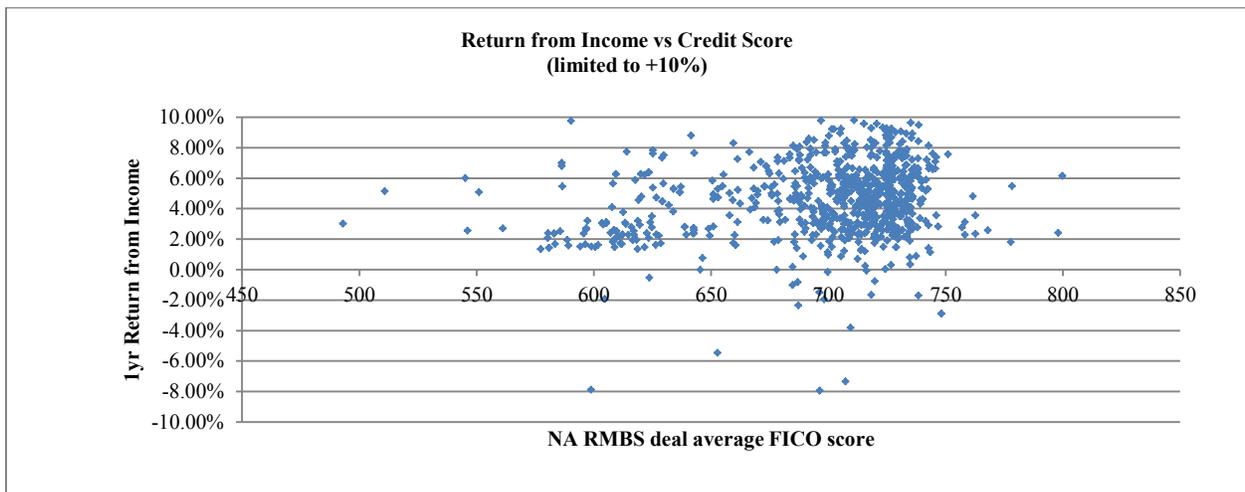
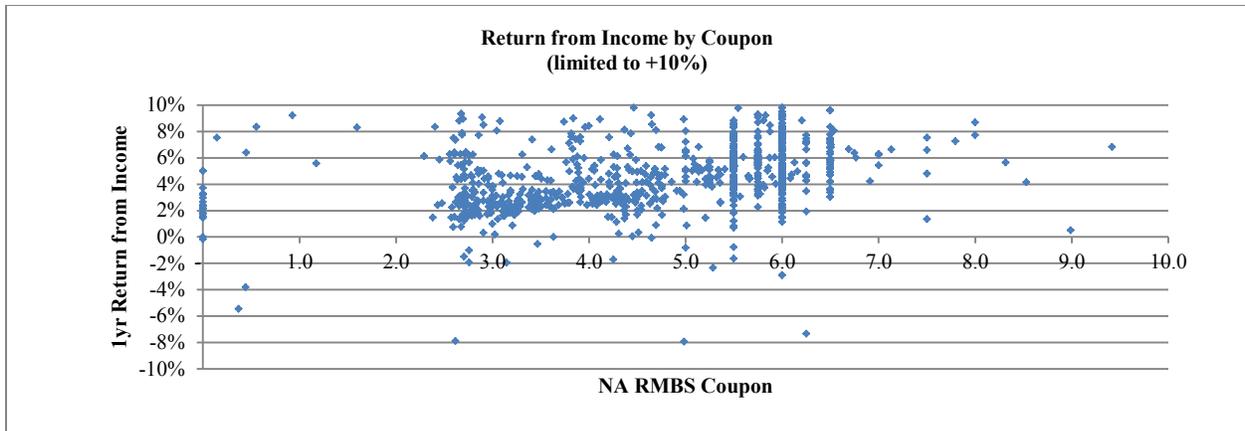
	Avg. MBS Income	Avg. Coupon	% Mezz	% Subs
MBSM Agg Ports	10.1%	4.9%	0.0%	0.8%
Fund 1	5.6%	5.7%	21.0%	34.8%
Fund 2	4.3%	4.4%	23.1%	35.8%
Fund 3	4.3%	3.9%	12.0%	1.2%
Fund 4	3.4%	4.0%	50.1%	15.1%
Fund 5	2.1%	3.7%	85.5%	9.5%

By contrast, we believe plenty of MBS Income is available in the secondary markets in senior bonds, and we feel no need to take on additional Credit leverage. Using the Income Factor allows us to have less than 1% of our portfolio is in Credit levered securities.

Relationships between MBS Income and Credit Factors

In corporate bonds, higher yields and coupons are usually associated with higher credit risk and lower ratings. This is not the case in MBS. **With secondary market NA MBS, we find no stable relationships between high Returns from Income and factors such as Ratings, Coupon or Credit Scores (ie collateral type – Prime, Alt-A or Subprime).**





Case Study 1 - similar bonds with different Income Return results

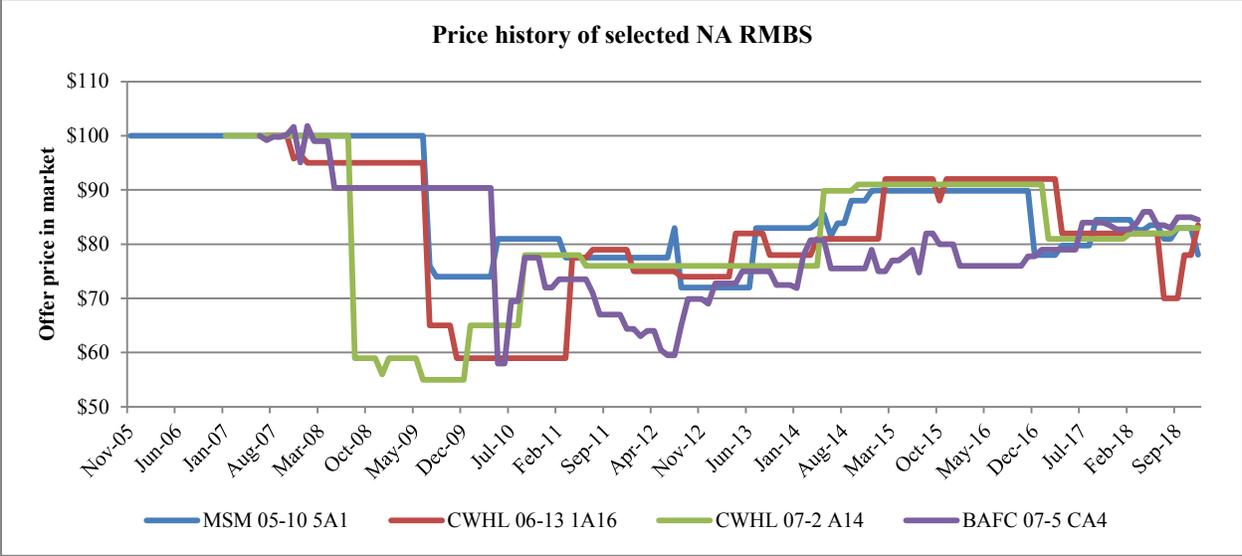
We have selected four Alt-A bonds from our 4/17/2017 NA market run that appear similar, with similar prices. We combed our databases for historical prices and computed the Return from Income for each bond. **The graphs and tables show that each bond’s Income Return varies in time and is also different from the other bonds.**

Name	MSM 05-10 5A1	CWHL 06-13 1A16	CWHL 07-2 A14*	BAFC 07-5 CA4
Coupon	6.00%	6.25%	6.00%	6.00%
Collateral Credit Score 12/2018	700	746	739	696
Rating 12/2018	NR/WR	WD/Caa3	WR/NR/NR	WD/NR/WR
Structure	Fixed Senior	Fixed Senior	Fixed Senior	Fixed Senior
Price on 4/14/17	\$79.75	\$82.00	\$81.00	\$79.00
Income Return 4/17 - 4/18	5.9%	6.6%	9.5%	2.9%

Issue Date	11/28/2005	7/27/2006	1/30/2007	6/29/2007
Total Return - Issue to 4/14/17	38.4%	39.3%	35.2%	18.7%
Annualized Total Return	2.9%	3.1%	2.8%	1.5%

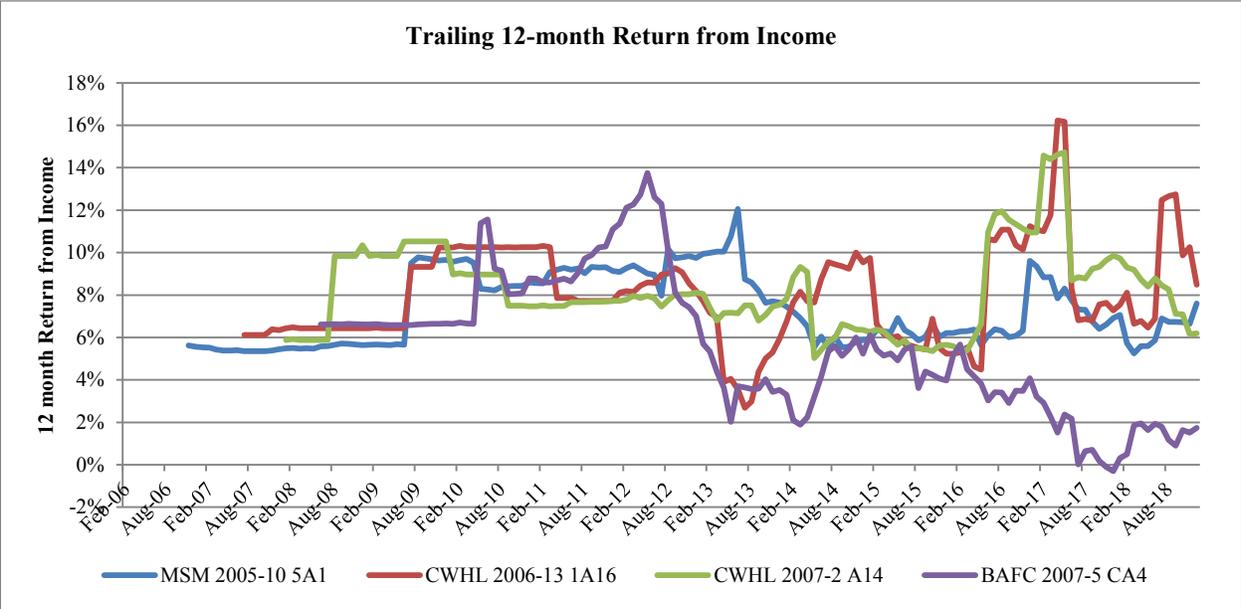
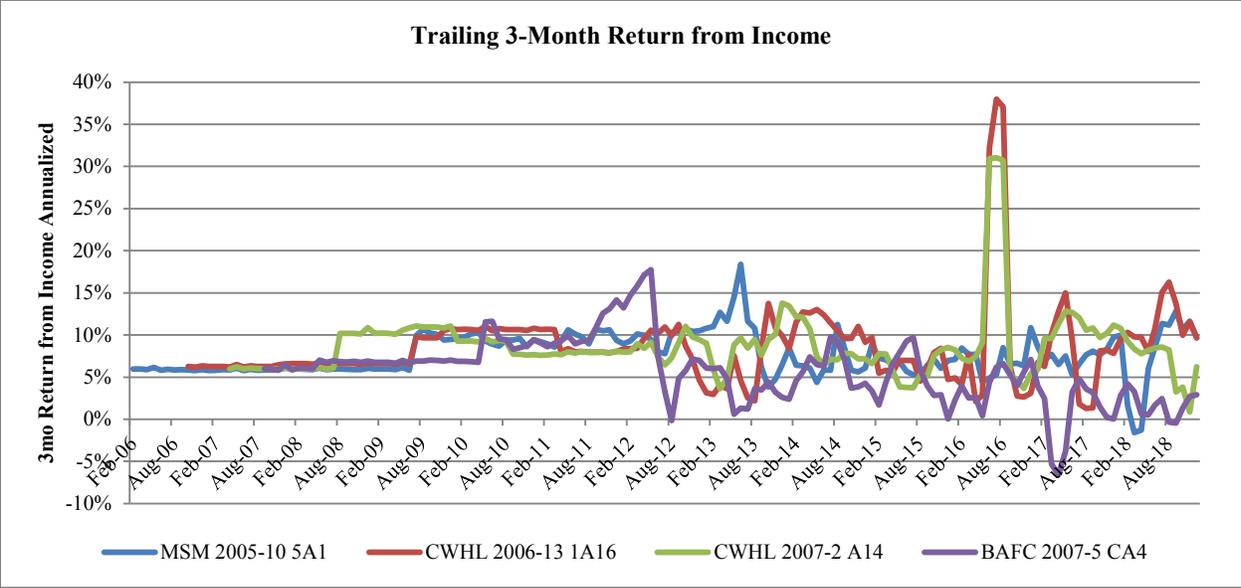
Last Price 2018	\$78.06	\$83.50	\$84.50	\$84.50
Total Return - 4/15/17 to 12/31/18	11.3%	14.2%	16.3%	10.8%
Annualized Total Return	6.4%	7.9%	9.1%	6.1%
Annualized Price Change Return	0.9%	0.7%	1.8%	3.1%
Annualized Income Return	7.3%	7.1%	7.3%	3.0%

***Note: We own other parallel bonds from the CWHL 2007-2 deal with identical cashflows to the A14 tranche used here**
All returns computations assume a 0% reinvestment rate – over long periods this underestimates return
Prices should be viewed as indications - bonds trade in wide price bands with trades rarely occurring at the “marks”



The prices of these similar bonds have mostly moved in tandem, especially over the longer period since the Crisis. The Return from Price Change is similar for the first three bonds even over shorter periods.

However, unlike other fixed rate bonds, Income Returns from MBS can vary over time, with a significant range, and differ from each other. The next charts show the 3-month and 12-month Income Returns for these MBS.

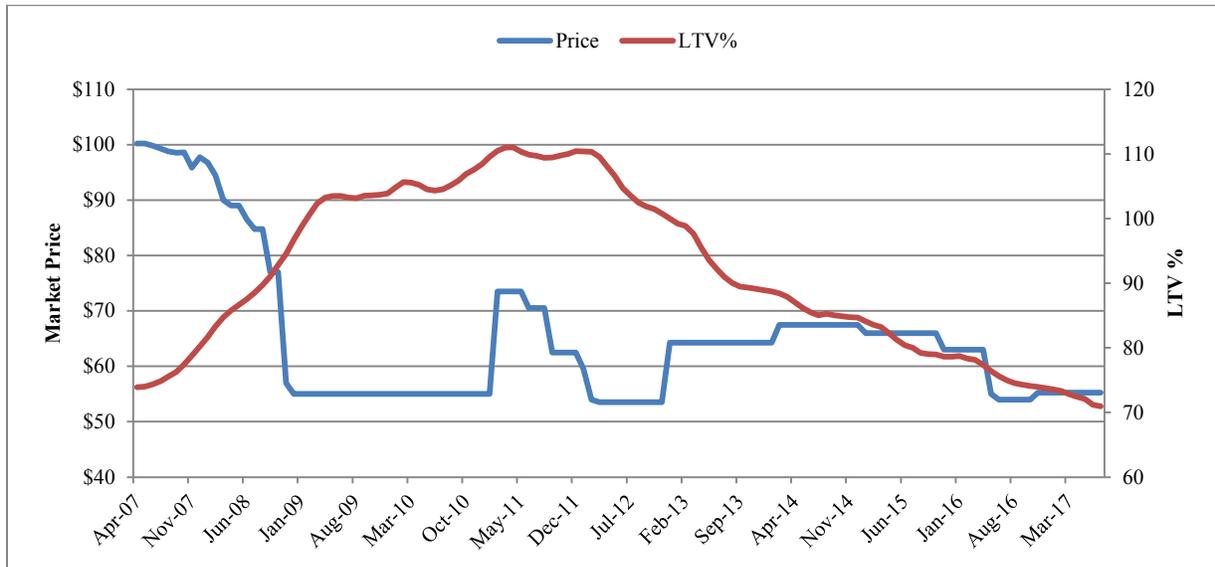


We selected Alt-A bonds that are similar, to demonstrate that Income Returns differ between even similar MBS at different points in time, and to show evidence that RMBS bonds go through periods of high and low income. Differences that are even more dramatic can be seen when comparing these with other types of bonds, such as Subprime bonds, or subordinated/mezzanine Credit levered bonds.

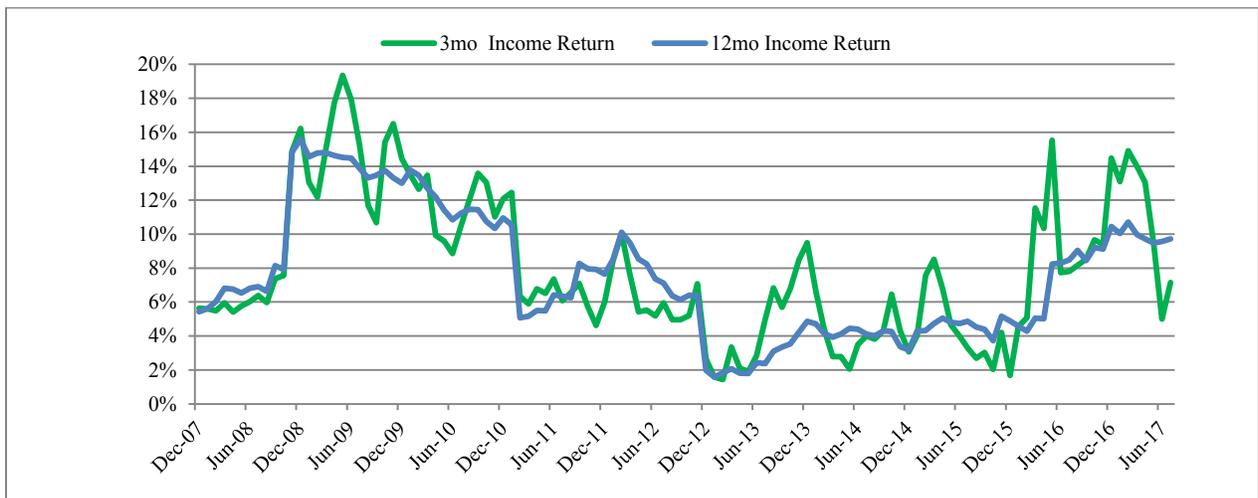
Case Study 2 – demonstrating the interaction of Factors behind variable Income Returns

The example used is a 2006 vintage bond we have owned since 12/2016, and have purchased numerous times – we have chosen not to identify it, as it is still available in the market in size, and we keep reinvesting into it.

The first graph shows the price history of the bond and the LTVs of the underlying mortgage loan collateral. The price has been in a range in spite of credit curing after 2012, even as housing recovered and LTVs (Loan to Values) declined.



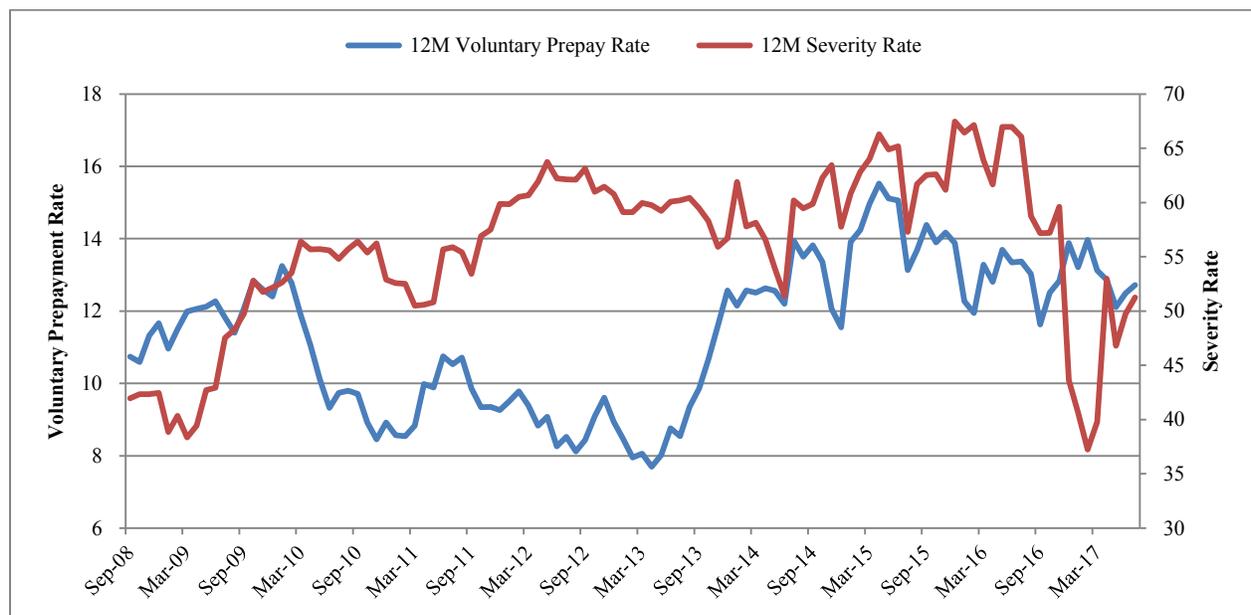
Income picked up in 2008 when the price declined, but then started declining as LTVs went up between 2009 and 2012. Surprisingly, Income remained low between 2012 and 2015, in spite of credit curing that started in 2012. Income finally recovered in 2016, and the bond switched to a High Income state (Income > 6%). MBS income varies over time.



A closer look at underlying factors explains why Income remained low after 2012, and why it picked up in 2016.

The chart below shows that prepayments (blue line) spiked in 2013 as the markets recovered and LTVs declined, as would have been expected. With the bond price ranging between \$50 and \$70, and prepayment rates between 12 cpr and 15 cpr, one would have expected Income to have gone up in 2013. Such a single factor bet on prepayments from credit curing would have failed as average income remained below 5% till 2016.

The red line (loan severity rate) in the graphs explains why such a bet on prepayments would not have worked for 3+ years, with significant opportunity cost. Severities on delinquent loans remained high till 2016, as the pipeline of loans in the foreclosure process had not cleared. The losses from severities offset the positive return benefits of prepayments. It was not until severities declined that Income spiked to over 10%, and both factors started working together!



It is the interaction of two factors on returns – prepayments and severities – that primarily determined the net Income rate realized for this bond at a given point in time.

Exploiting the MBS Income Factor – building diversified portfolios of High Income MBS

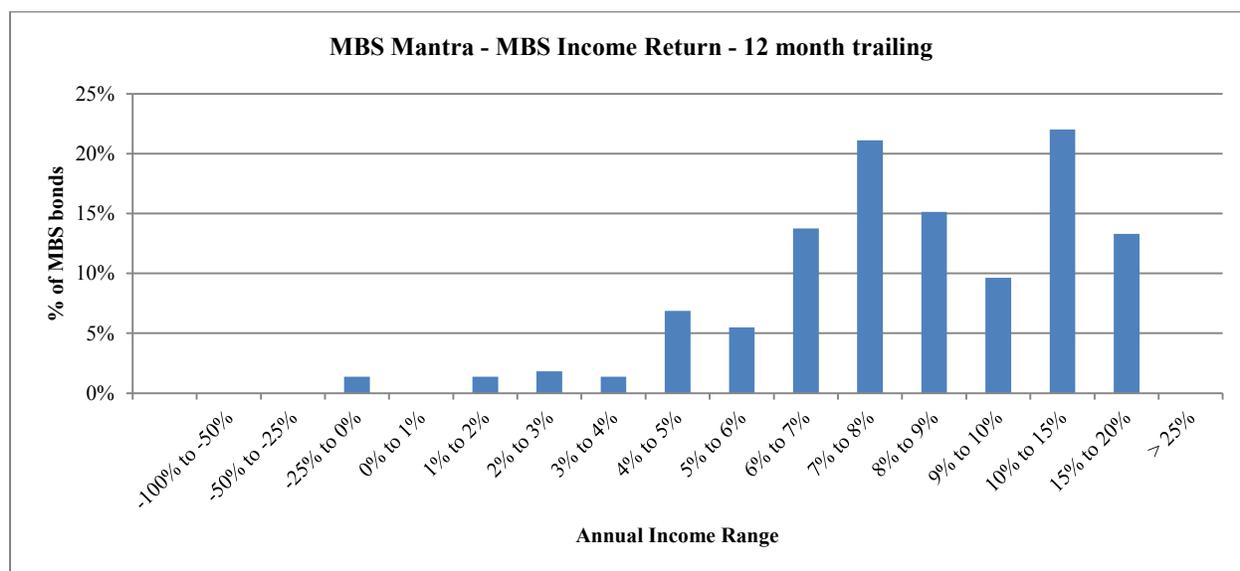
At MBS Mantra, we exploit the Variable Income nature of MBS. We use a systematic process to identify the current state of MBS Income of all the MBS offerings in the market – High (>6%), Average (3% to 5%), or Low (<3%).

We further screen each High Income MBS by identifying the primary drivers of its Income status, (which is sometimes the absence of a driver that is adversely impacting other MBS), and identify bonds with stable High Income trends. **By tracking trends in Income Returns, and identifying the factors behind changes in Income Returns, it is possible to build portfolios of High Income MBS that defy “market yields”.**

Through sizing and diversification, we create portfolios with stable High Income. The majority (88% in Dec 2018) of our aggregated portfolio has Income over 6%, averaging 8% to 10% annualized in any given month, even though the monthly and quarterly income of each bond varies significantly over time.

We systematically cull Low Income MBS from our portfolios (when Income declines), while reaping High Income from the remaining portfolio. We reinvest both cashflows from MBS as well as cash from sales into more High Income MBS, at reinvestment rates that are significantly greater than “market yields” – **we compound at High Income rates!** The continuous reinvestment and compounding process automatically makes such an MBS portfolio defensive, with low correlations and Betas to other bonds and sectors, and protects capital. (We have described the resulting portfolio characteristics in our previous newsletters, such as [Oct 2017](#), and [Dec 2018](#) and show comparative statistics versus benchmarks and the effect of compounding in our [Factsheets](#)).

The next chart shows the resulting distribution of 12 month Income for our portfolio – **we harvest the right tail of the market MBS Income distribution.** Compared to our competitors, we have a very small percentage of the portfolio in the ‘left tail’, or even the ‘market average’.



Our process and strategy was initially identified in 1994 as an “arbitrage finder”, when I realized that models could not capture MBS returns or identify return risk, and excess returns were available to be found. Surprisingly, the most common drivers of durable MBS

High Income are still secondary market “CMO arbitrage” – where the prices of all the bonds in a deal do not add up to the price of the collateral (usually where an incorrect - too high for the risk - discount rate is used to price an individual bond), or “document arbitrage” – where prospectus reading will result in the use of different inputs and scenarios than typically used to model returns and identify risk. Both types of arbitrage are represented in our portfolios, partially explaining our low turnover – we let such bonds “run” and usually mature. An arbitrage that I identified in 1994 is still active, and is a part of our portfolios.

It is for this reason that we have renamed the MBS sector as “Variable Income Securities”, and why we believe that the concept of “Yield” for MBS is almost meaningless (which will be another white paper).

We welcome your questions and comments.

Regards, Samir

July 11, 2019

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