BRAMSHILL INVESTMENTS
April 2023

MONTHLY INSIGHTS

Decomposing Rates, Spreads and Yields

BRAMSHILL
INVESTMENTS

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Bramshill Investments ("Bramshill") investment process uses both quantitative frameworks and qualitative inputs when researching asset classes, themes, and investments across our investment universe. At the same time, we use a Top/Down and a Bottom/Up process to analyze opportunities. In addition, our firm also looks at Fundamental, Technical, and Macro/Environment characteristics when constructing our clients' portfolios.

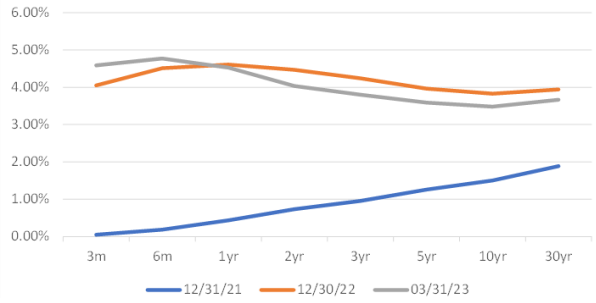
	Qualitative	Quantitative
Top / Down	Macro/Environment Technical Fundamental	
Bottom / Up		

This month's Monthly Insights piece focuses on a few of the Quantitative tools we use in our Top/Down process.

Rates and Yields

During the last fifteen months, we have witnessed some of the fastest increases in rates ever experienced over the last few decades. Below is a graph of the U.S. Treasury ("UST") curve and its transformation since the end of 2021. Much has been written on this topic, so we will not dwell further here.

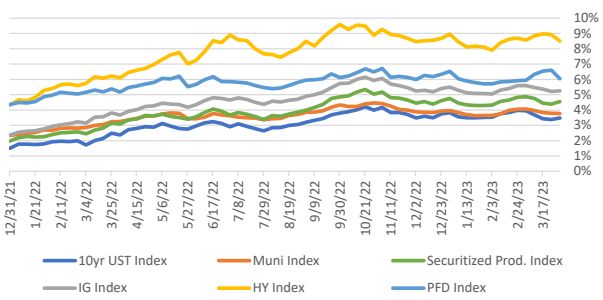
Graph 1: U.S. Treasury Curve *



Source: Bloomberg

The increase in rates across the curve has substantially raised yields on most fixed income instruments. Below is a graph of certain asset classes that Bramshill invests in.

Graph 2: Yields *



Source: Bloomberg

Yields and Spreads

There has recently been much discussion on whether certain fixed income sectors are now attractive due to these higher yields. For simple analysis, we will disect these yields into a rate component and a spread component.

The rate component is the base for any investment and is delineated by the U.S. Treasury Curve in the previous chart. An interest rate can be thought of as the basic cost of money over a certain period of time and also represents the minimum opportunity cost of capital for any investment. Spreads, on the other hand, are a form of reward for certain types of risks one finds in an investment:

1. Credit risk: probability and magnitude of loss (default rates and recovery rates)
2. Complexity: documentation, covenants, underlying collateral opacity, etc…
3. Liquidity: the ease (or lack thereof) of transacting (buying or selling) a given investment
4. Ownership structure: examples being, single investor versus small club deal versus fully syndicated deal versus public markets. This characteristic can have an impact on the liquidity dimension as well. But also allows for in/direct discussions with issuer in case of dire straits for the company
5. Various other aspects: these can be esoteric and very unique to a specific investment

The above risk premia ebb and flow, and sometimes as an investor you get attractively compensated for taking them, and sometimes the market can price undue risk without fair and proper compensation.

At Bramshill, our investment process stands on the three pillars of our firmwide investment philosophy:

1. Risk as permanent loss of capital (probability and magnitude of potential loss)
2. Absolute Value (orientation)
3. Relative Value (allocation)

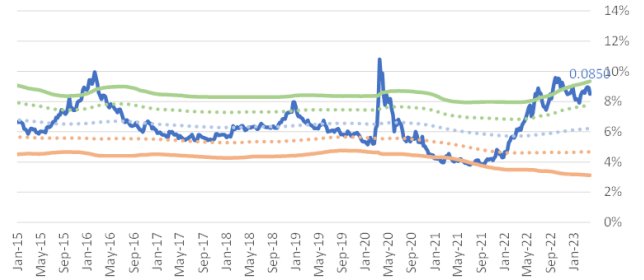
The first pillar, which is considering Risk as a permanent loss of capital instead of using volatility or tracking error to a benchmark as our preponderant internal risk measure, is mostly assessed through fundamental analysis on individual investments, therefore and for the specific purposes of this paper which focuses on broader picture thinking, we will not dwell on this topic here.

When assessing the Absolute Value of an asset class (our second pillar), Bramshill utilizes two basic quantitative models to analyze a segment of the Fixed Income universe through its yield, spread, duration and/or historic total return. The first quantitative model, our Z-score model, utilizes a normal distribution for analysis and typically functions well inside of a business cycle given its shorter period of analysis (5 years of rolling data), but may not be as adept at handling paradigm shifts or a rotation to a new business cycle. The Z-score model

analyzes deviations from the mean for that variable. The greater the deviation, the stronger the signal and the more interested we become in that asset class or segment of the market.

For example, in the below chart, we analyze the Yield-to-Worst ("YTW") of the High Yield index ("HY"). The blue line represents YTW of HY. The light blue dotted line represents the rolling 5-year mean, the green dotted line represents the rolling 5 year +1 standard deviation, and the orange dotted line represents the rolling 5 year -1 standard deviation. The solid green and orange line represent the +2 and -2 standard deviation lines, respectively.

Graph 3: HY YTW *



Source: Bloomberg, Bramshill

Below is a graph of just the Z-score (deviations from the mean) of the YTW of the HY index from the chart above. As can be seen, the Z-score tends to be mean reverting and oscillating around zero. The recent increase in yield was clearly substantial and quite fast, going from a -2 standard deviation in the summer of 2021 (rich) to a +2 standard deviation in the summer of 2022 ("cheap" or undervalued). This overall +4 standard deviation move in just twelve months is why the price adjustment was so brutal.

Graph 4: HY YTW Z-score *

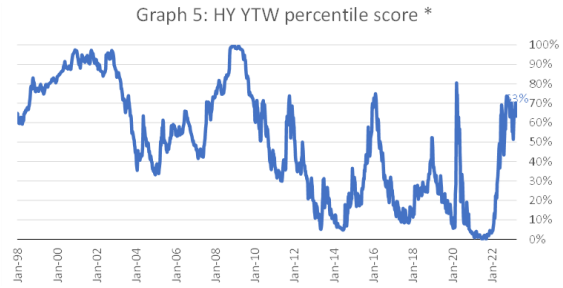
Source: Bloomberg, Bramshill

Our second quantitative model, the percentile model, utilizes a different statistical approach and encompasses a larger data set (25 years of data) so as to include three to five business cycles within that timeframe. This model provides long-term historical context and is a good complement to the Z-score model's shorter 5 year rolling time dataset.

Please refer below for the percentile score over the last 25 years for the same YTW of the HY index time series. Higher percentile values represent higher yields (therefore more attractiveness) and lower percentile values represent an asset class becoming more expensive (as represented in lower yields). Note how in 2019, HY yields were decreasing, historically low and not compelling, and how they then quickly jumped for only a brief period during Covid and became attractive and then quickly came in again to expensive levels (low yields) during 2021.

Note how though becoming increasingly attractive, yield levels did not reach Great Financial Crisis (2008) levels, nor 2001/2002 levels. As mentioned above, the percentile model provides a better overall long term historical context.

Graph 5: HY YTW percentile score *



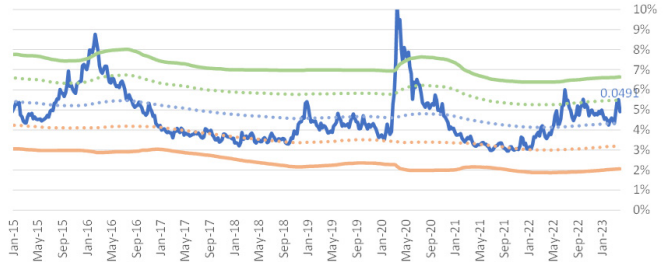
Source: Bloomberg, Bramshill

When analyzed through both of these prisms, during Q3-2022 HY corporate bonds had reached yields of approximately 9% which represent over two standard deviations from the mean (Z-score model) and 70th percentile scores (percentile model). Therefore, we might have considered HY bonds to be "cheap" in absolute terms on both these metrics. But herein comes our third pillar of investing: Relative Value.

When considering Relative Value, we must not only consider that asset class relative to other asset classes, but also relative to Cash & Cash Equivalents (i.e. short-term U.S. Treasury Bills) as an investment allocation. After all, a 4.5% yield on a 6 month U.S. Treasury Bill has "no" credit risk, basically accrues in a straight line with almost no volatility and very limited potential for drawdown and is one of the most liquid investment types available. These traits are very desirable amidst uncertainty and turmoil, as liquidity provides the flexibility to quickly deploy capital into risk assets should opportunities present themselves. Bramshill has shown acumen through its longer than 14 year history in being patient and disciplined in its investment process so as to deploy that liquidity opportunistically and successfully. Our investors, being knowledgeable and understanding of our investment process and successful investing history, have granted us the amplitude to be disciplined and patient which is one of the keys to our attractive risk-adjusted performance.

Therefore, it is imperative that we measure these yields to the UST curve and to other asset classes. Below is the difference between the yield on the HY index relative to the yield on the 5yr U.S. Treasury Note. When looked through this lens, we can observe that most of the increase in the yield of HY has really been due to the increase in UST rates, not to a substantial cheapening of the HY asset class itself. That is, the increase in the general cost of money (i.e. increase in UST rates) has increased the yield in every asset class. The spread between HY and UST has become slightly more attractive, yes, but not to levels that Bramshill would consider particularly attractive (yet).

Graph 6: HY YTW versus 5yr UST YTM *



Source: Bloomberg, Bramshill

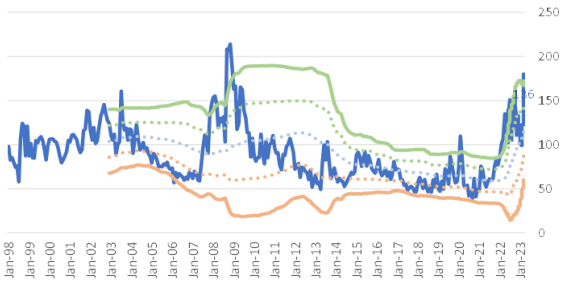
To be fair also, these are nominal spreads, not 'risk-adjusted' spreads, which is how Bramshill really evaluates its potential investments. It is not the same for HY spreads to widen to 800 basis points right before a recession, when default rates are expected to go up (bad for bond investor) and recovery rates potentially go down (bad for bond investor), versus when no recession is in sight. Sometimes spreads widen and dislocate for other

reasons than a recession (such as in Q1-2016). But if investors expect higher default rates and/or lower recovery rates, then wider spreads might still not be attractive enough to compensate for those risks. Therein lies the rub, and the value added by an active fixed income manager: in "separating the wheat from the chaff" at the single name level when a broad-based asset class pricing dislocation occurs, be it preceding a recession or not.

Rate Volatility

With interest rate volatility hitting close-to-historic peaks, there is also increased uncertainty around the cost of money (i.e. rates). Please refer to graph below, which represents the MOVE index, a measure of interest rate volatility.

Graph 7: Rate Volatility (MOVE Index) *



Source: Bloomberg, Bramshill

If an investor does not really know what the cost of money is, which is ultimately the medium of exchange to purchase every other investment, how can they have confidence what the real price of any investment is? High interest rate volatility is very hazardous to the overall economic system as it is the underpinning of the valuation of every asset. Valuation models should not only include the level of interest rates, but somehow also incorporate their volatility and confidence on those levels. Spreads (and other relative value measures) should somehow reflect that heightened price discovery uncertainty. We believe they currently do not in most asset classes. Higher volatility in any marketplace should also naturally widen bid-offer spreads (the "cost" of accessibility to buy/sell a security) as looked through the lens of market microstructure. Think of a bid as being short a call option (the entity bidding is willing to buy from another entity at a certain "strike" price) and the offer as being short a put option (the entity is offering to sell to another entity at a certain "strike" price). Then the higher the volatility in that asset, the wider the bid-offer spread should be since both bid and offer are short option positions, as discussed above, and option prices are highly sensitive to the volatility of the asset (higher volatility would demand higher price/compensation). Both the bid and offer want to "hedge" this higher asset volatility by separating further away from each other. This wider bid-offer spread typically creates larger transactional friction and impacts liquidity in that asset's marketplace by reducing it. It is not uncommon to see liquidity reduced as volatility increases. For example, we have recently seen substantial deterioration in the liquidity of the U.S. Treasury market, which naturally disseminates to various credit markets as well.

The above is just an individual example of the types of analysis we have embedded into our investment process. We conduct these types of analysis and cross-analysis on all the asset classes in which we invest, be they government-related, corporate credit, or securitized products. Our internal proprietary database can analyze over 700 variables (spreads, yields, duration, returns, etc...) through these quantitative lenses and we create internal weekly reports to highlight any statistical anomalies that warrant further qualitative analysis by our investment team.

Due to the increase in interest rate volatility and uncertainty in asset class valuations, a highly uncertain overall macro-economic environment, and the relative unattractiveness of many asset classes, Bramshill continues to be defensively positioned across its portfolios, retaining significant liquidity and considerable "dry powder" while still generating attractive absolute yields. We believe flexibility provides optionality on opportunity.

About Bramshill Investments

Bramshill Investments is an alternative fixed income asset manager with over $4.40 billion in assets under management as of March 31, 2023.

Founded in 2012 and headquartered in Florida, with offices in California and New York, the firm offers alternatives to traditional fixed income investment management featuring a variety of strategies across various debt and fixed income markets and specializing in preferred securities.

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*Graph Footnotes (Bloomberg Index/Function):

Graph 1 - Data: G0O1 (3m) YTM, GO02 (6m) YTM, GC03 (1yr) YTM, GA02 (2yr) YTM, GA05 (5yr) YTM, GA10 (10yr) YTM, GA30 (30yr) YTM
Graph 2 - Data: GA10 (10yr) YTM, U0A0 (Municipal) YTM, LD19YW (Securitized Products) YTW, C0A0 (IG) YTW, H0A0 (HY) YTW, P0P2 (Pfds) YTM
Graph 3 - Data: H0A0 (HY) YTW
Graph 4 - Data: H0A0 (HY) YTW
Graph 5 - Data: H0A0 (HY) YTW
Graph 6 - Data: H0A0 (HY) YTW, GA05 (5yr) YTM
Graph 7 - Data: MOVE Index