SMART BETA IN FIXED INCOME
A Factor-Based Approach to Investing

BlackRock’s Arne Staal, Marco Corsi, Sara Shores and Chris Woida recently published “A Factor Approach to Smart Beta Development in Fixed Income” in the Summer 2015 issue of The Journal of Index Investing. The paper identifies the main factors driving fixed income returns, looks at the composition of traditional fixed income indices and explores potential uses of smart beta to improve investor outcomes. Following is a summary of the findings; the full paper can be downloaded here.

Throughout the three-decade bull market in bonds, cap-weighted fixed income indices have generally delivered high risk-adjusted returns and provided important ballast to equity market risk. As the bull market appears to be coming to an end, investors are increasingly concerned about managing exposures to the common risk factors that drive returns for bond portfolios. At the same time, passively managed investment products that have alternative weighting schemes—often called smart beta—have gained popularity among equity investors. In essence, smart beta strategies seek to capture specific market anomalies or factors in a rules-based and systematic fashion.

Given the challenges that a rising-rate environment may bring, it is an opportune time to reevaluate traditional fixed income investing and explore whether a smart beta approach can help investors enhance diversification, improve risk-adjusted returns and capture specific factor exposures in fixed income.

Traditional Fixed Income Indices

Traditional fixed income indices tend to be relatively concentrated from both a risk perspective and an issuer perspective. This lack of diversification results from the cap-weighted nature of their construction: because the market value of an issuer’s debt is determined by the price of its bonds and the amount of debt that it has outstanding, issuers with higher debt loads and more expensive bonds garner higher weights in a cap-weighted index. The somewhat counterintuitive result is that the leading cap-weighted indices, such as the Barclays US Aggregate Index (the Agg) and the Barclays US Credit Index, tend to be concentrated in highly indebted issuers. Further, core fixed income indices are heavily dominated by interest rate risk, making them particularly sensitive to rising interest rates.

Sources of Risk and Return in Fixed Income

At the heart of any potential smart beta approach is a clear understanding of the key characteristics of bond markets. Fixed income markets are first and foremost very macro-driven. The risk and return of broad fixed income indices can be largely explained by two risk factors: interest rate risk and credit risk. In addition, there are market-structure phenomena in fixed income that create potential opportunities. Bond market investors often have set preferences regarding quality and term
structure, resulting in a segmented market. We also recognize that bond market returns are inherently asymmetric, and therefore avoiding potential defaults is the most impactful security-selection decision for fixed income investors.

Armed with an understanding of the nature of risk and return in fixed income markets, we examine how investors may be able to use smart beta techniques to construct more efficient alternatives. While we believe that there are myriad opportunities to do so, we will focus on potential solutions to three specific objectives of many fixed income investors:

1. Better diversification
2. Improved risk-return profiles
3. Precision exposure to specific factors or market anomalies

In the following examples, we will consider each of these objectives in turn.

Diversifying Macro Risk Factor Exposure in Aggregate Indices
As noted above, risk and return in broad fixed income indices are largely driven by two macro factors: interest rate risk and credit risk. Historically, within broad-based indices such as the Agg, interest rate risk has been the dominant factor by a wide margin, while credit spreads have contributed relatively little in terms of either risk or return. (See the left-hand bars of the two charts below.)

One approach to more diversified portfolios—and reduced exposure to rising interest rates—would be to balance credit and interest rate exposure in core bond portfolios based on their relative contributions to risk. The risk-balanced strategy consists of a basket of US corporate bonds (investment grade and high yield), mortgage-backed securities, Treasuries and Treasury futures, where the weights are determined on a monthly basis to equally balance spread risk and rate risk.

To test the effectiveness of this approach we decompose the risk and the return of the hypothetical risk-balanced strategy over the last five years by identifying the contribution coming from rates exposure and the contribution coming from credit spread exposure. The results are summarized in the exhibit below and highlight the fact that the risk-balanced strategy has a better-diversified profile in terms of risk and return contribution than the Agg.

Below, we compare the performance of the risk-balanced strategy to the Agg and see that the risk-balanced strategy exhibits total returns very close to the Index over the full time horizon, but with less volatility and a higher yield to maturity.

PERFORMANCE COMPARISON BETWEEN BARCLAYS US AGGREGATE INDEX AND HYPOTHETICAL RISK-BALANCED STRATEGY

<table>
<thead>
<tr>
<th></th>
<th>RETURN</th>
<th>VOLATILITY</th>
<th>RETURN OVER VOLATILITY</th>
<th>YIELD TO MATURITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barclays US</td>
<td>6.0%</td>
<td>3.6%</td>
<td>1.7</td>
<td>2.1%</td>
</tr>
<tr>
<td>Risk Balanced</td>
<td>5.8%</td>
<td>2.6%</td>
<td>2.2</td>
<td>2.8%</td>
</tr>
</tbody>
</table>

Sources: Blackrock and Barclays. Figures calculated over the period from December 1991 to March 2015. Returns and volatility are annualized. Yield to maturity is as of March 2015. Index performance is shown for illustrative purposes only. One cannot invest directly in an index.

Improving the Risk-Return Profile of Global Treasury Indices
Beyond balancing macro risk factors like interest rates and credit spreads, we also examine tilting portfolios toward more risk-efficient countries or sectors.

For example, the Barclays Global Treasury Index appears to be overly concentrated in countries with relatively high debt burdens, some of which also carry exceptionally low yields (e.g., Japan). A more efficient index portfolio may be
In order to gauge credit risk at the country level, we use the BlackRock Sovereign Risk Index, published since 2011 and based on a comprehensive list of relevant fiscal, financial and institutional metrics. By combining this sovereign risk indicator with a country’s yield curve, we can rank various countries based on their yield-to-risk trade-off and then tilt weights in the standard index toward the countries with better scores. The resulting index is tilted away from Japan, Italy and France and toward the US, Germany and South Korea, as illustrated in the chart above.

This simple modification results in a portfolio that exhibits higher risk-adjusted returns, increased yield and lower drawdown than the standard Barclays Global Treasury Index, as seen in the table above.

**Fine-Tuning Exposure in High Yield Indices**

While the previous two examples highlight the possibility of using a smart beta approach to improve upon common fixed income indices by taking a more deliberate approach to risk exposure, our final analysis seeks to exploit the anomalous behavior of a specific category of high yield bonds: fallen angels.

Fallen angels are high yield bonds that were rated as investment grade at the time of issuance and then subsequently downgraded. The downgrade event triggers the exclusion of these bonds from investment grade corporate indices and leads to a subsequent sell-off driven by benchmarked investors who can no longer hold the downgraded bonds. The result of this activity is pressure on the bonds’ price and underperformance of the fallen angels with respect to high yield bonds displaying similar characteristics. Once the selling pressure instigated by the rating migration is over, the price tends to revert to the equilibrium level.

To take advantage of this well-documented phenomenon, we have examined the performance of a strategy that invests in all of the bonds included in the Barclays US High Yield Index that were rated as investment grade at the time of their issuance. The bonds are market-cap weighted, and the basket is rebalanced on a monthly basis. And, as seen in the table below, the fallen angels strategy outperforms the benchmark in terms of returns, with a slightly higher level of volatility and drawdown.

**PERFORMANCE OF THE FALLEN ANGELS STRATEGY VS. THE BARCLAYS US HIGH YIELD INDEX**

<table>
<thead>
<tr>
<th></th>
<th>RETURN</th>
<th>VOLATILITY</th>
<th>RETURN OVER VOLATILITY</th>
<th>WORST DRAWDOWN</th>
<th>YIELD</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fallen Angels Strategy</td>
<td>11.06%</td>
<td>11.03%</td>
<td>1.00</td>
<td>-36.80%</td>
<td>5.26</td>
<td>5.78</td>
</tr>
<tr>
<td>Barclays US HY Index</td>
<td>7.22%</td>
<td>9.66%</td>
<td>0.75</td>
<td>-33.31%</td>
<td>6.61</td>
<td>4.21</td>
</tr>
</tbody>
</table>

Source: Barclays as of April 2015. All figures are based on monthly returns from August 1998 to March 2015. Returns and volatility are annualized. Yield and duration are as of March 2015. The universe of fallen angels is derived from the Barclays US HY Index and consists of all bonds which were rated as investment grade at the time of issuance. Each selected bond stays in the strategy until it is excluded from the Barclays US HY Index. Rebalancing is done on a monthly basis. Hypothetical index performance is shown for illustrative purposes only. One cannot invest directly in an index.
This phenomenon of fallen angels is just one example of structural anomalies that persist in fixed income markets (indeed, we believe in every asset class) that may present opportunities for rules-based portfolios to improve investment results.

**Conclusion**

Given the current macroeconomic environment and the prospect for an extended period of rising interest rates, many investors are seeking more diversified and factor-aware approaches to fixed income investing. Innovative approaches to index-based investing in fixed income may help improve risk-adjusted returns via strategies that recognize and diversify among the sources of risk and return in bond markets.

While smart beta represents a relatively new approach to fixed income investing, this area of research may help investors address many of their most pressing needs. Time will tell if these promises will be fulfilled, but the opportunities surely look worth pursuing.

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Hypothetical example for illustrative purposes only. No representation is being made that any account, product, or strategy will or is likely to achieve profits, losses, or results similar to those shown. Hypothetical or simulated performance results have several inherent limitations. Unlike an actual performance record, simulated results do not represent actual performance and are generally prepared with the benefit of hindsight. There are frequently sharp differences between simulated performance results and the actual results subsequently achieved by any particular account, product, or strategy. In addition, since trades have not actually been executed, simulated results cannot account for the impact of certain market risks such as lack of liquidity. There are numerous other factors related to the markets in general or the implementation of any specific investment strategy, which cannot be fully accounted for in the preparation of simulated results and all of which can adversely affect actual results.

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