Understanding Fixed-Income Benchmark Risk

Fixed-income indices are complex, and the universe of choices for a benchmark is vast. To match a portfolio’s risk exposures to a benchmark and to avoid unexpected disparities in performance, investors must understand how an index is constructed and how indices differ from each other. Once a benchmark is chosen, applying intelligent guidelines helps investors ensure consistency in relative risk exposures and performance results.

The fixed-income investing landscape has changed dramatically in the decades since index providers first began offering fixed-income indices during the 1970s. As fixed-income products have become more complex and sophisticated, index providers have responded in kind with a proliferation of subindices, custom indices, and new weighting schemes. Because an index may define the universe of securities in which a manager may invest, the choice of an index as a benchmark can directly affect portfolio risk exposures and relative performance measurement. For these reasons, investors should thoroughly understand an index before selecting it as a benchmark. Once an index is chosen, a well-thought-out investment policy must be put in place to avoid risk exposures and performance divergence from the benchmark that are unanticipated.

Fixed-Income Index Construction: A Complex Endeavor

The challenges inherent in constructing fixed-income indices are vastly different and far more complex than for equity indices, according to Bob Kopprasch, CFA, managing director at The Yield Book, Citigroup. In contrast to a broad market equity index that contains only two types of securities (dividend and non-dividend paying stocks), a broad market fixed-income index comprises securities with myriad characteristics and cash flow structures. The amount of data collected for each bond in an index can be significant: coupon, maturity, call schedule, frequency of coupon payments, and agency ratings are a few examples. Many analytics are calculated for each bond, including duration, convexity, and yield. And, although most companies have only one class of equity outstanding, those same companies may have many bonds that will qualify for an index. Surveillance of issues in the index takes place daily for activity such as corporate actions, ratings downgrades or upgrades, calls, and so on, and changes to the index generally are implemented monthly.

Pricing presents the biggest problem, because bonds trade over the counter rather than on an exchange and many bonds trade infrequently, if at all. Prices in an index are derived from actually traded prices or from traders’ estimates, matrix pricing, or a third party. Investors should know how the prices in their chosen benchmark are determined. Some index providers use more than one pricing method, and certain methods, such as actually traded prices, tend to be more reliable than others. Finally, the value of many fixed-income securities is based on analytical measures such as prepayment models. “These analytical measures are not completely unambiguous and are not universal,” says Kopprasch. “Fixed income today is not the fixed income of the past. Coupons vary, maturities are unknown. The income is not fixed.”

Market-Capitalization Weighting

The foundation of an index is its weighting scheme, which has a predominant effect on portfolio risk exposures for portfolios that follow the index. The vast majority of indices—both fixed-income and equity—are market-capitalization weighted, also known as value weighted. In Benchmarks and Investment Management,
Siegel (2003) states that this weighting scheme originally was developed for equity indices as a way to mimic the broad equity market and enable an investor without special insight into security values to hold a mean–variance-efficient portfolio. When applied to fixed-income indices, value weighting creates interesting problems for investors. Siegel (2003) outlined two such issues: the duration problem and the “bums” problem. The duration problem refers to the fact that an index’s duration is essentially a “historical accident,” an amalgamation reflective of borrower preferences. Siegel states this duration is not necessarily the ideal duration for fixed income investors whose preferred durations—and interest rate risk exposures—depend on their individual return objectives and investment time horizons. In this sense, a market value-weighted broad fixed-income index does not represent the optimal benchmark for all bond investors.

The second issue Siegel describes with value-weighted fixed-income indices, the bums problem, is that the largest weightings in the index belong to the largest borrowers. These borrowers may be highly creditworthy entities that access the market on a large scale to take advantage of low-cost funding, or they may be distressed issuers who are heavily indebted. Siegel refers to the latter as “bums.” Capitalization-weighted benchmarks, he points out, are unlikely to be mean–variance efficient for fixed income investors closely tracking these benchmarks if investors are forced to buy risky bonds simply because they represent the largest weights in the index. The bums problem applies to both credit issuers and sovereign entities.

Another problem with market-capitalization-weighted fixed-income indices is that their investability typically is overstated because of liquidity and size issues. Smaller-sized issues often are bought and held until maturity, as are many high-quality corporate securities. Liquidity concerns, along with the sheer size of broad market indices—the Barclays Aggregate Index has nearly 8,000 constituents—prohibit managers from fully replicating such an index.

Finally, risk exposures such as duration and sector allocations must be monitored on an ongoing basis. Duration and sector weights can shift significantly, even in relatively short periods. In the four years ended 31 December 2011, the Treasury component of the Barclays U.S. Aggregate Index rose to 36% from 22% at year-end 2007, a nominal increase of 14% but a relative increase of 64%. The mortgage-backed securities (MBS) sector weighting declined to approximately 31% from 38%. During that time span, the index’s duration fluctuated significantly, ranging from 3.7 years to 5.2 years. Investors adhering to the index must ask themselves if such changes are in line with their optimal risk exposures and return objectives.

**ALTERNATIVE WEIGHTING SCHEMES**

Market-capitalization weighting is by far the dominant weighting scheme among indices, but other schemes have been developed to address some of the issues inherent in cap-weighted schemes. Equity index providers routinely adjust cap-weighted equity indices for closely held shares and for cross-holdings by creating float-adjusted indices, which subtract from the index those shares that are not available for trading. This adjustment provides a more accurate representation of the investment opportunity set. Float adjusting became relevant for U.S. fixed-income investors after the Federal Reserve began buying Treasuries, agency debt, and MBS in 2008 as part of its quantitative easing program in response to the global financial crisis. To reflect the decline in market value and liquidity of those securities held in Federal Reserve accounts, Barclays introduced the U.S. Float Adjusted Aggregate Index in 2009 as an alternative to its flagship U.S. Aggregate Index. MBS investors in particular may find a float-weighted index to be of even greater interest in light of the Fed’s recent announcement that it will continue to buy and hold government securities for a prolonged period. As of 28 September 2012, the float-adjusted index reflects a sector weighting of nearly 15% less in MBS than the unadjusted index.

In an equal-weighted scheme, all index constituents are given the same weight in an effort to eliminate the bums problem. S&P Dow Jones Indices offers an equal-weighted corporate bond index, the Dow Jones Corporate Bond Index, which strives to eliminate not only the bums problem but also illiquidity issues. The index consists of 96 recently issued investment-grade corporate bonds, diversified by maturity and industry sectors. The index is rebalanced monthly according to set rules. Bonds that are thinly traded are replaced with newer, more liquid issues to keep the index investable. The Dow Corporate Index’s small size stands in stark contrast
to the several thousand issues in the capitalization-weighted corporate bond indices that are subsectors of broad market indices. Sector and maturity exposures in an equal-weighted index are more stable than in a cap-weighted index but also are less reflective of overall market weightings. In addition, equal-weighted indices may require more active trading for rebalancing purposes, and hence more transaction costs.

GDP weighting is a more recently developed weighting scheme that weights sovereign entities in international or global indices by the size of their economies rather than the value of their outstanding debt. GDP weights can be applied to countries or to geographic regions. This approach is designed not only to address overconcentration of sovereign entities in an index but also to provide investors with increased exposure to emerging markets that have less developed bond markets. Fundamental weighting or factor weighting is another relatively new weighting scheme for sovereign indices. The Barclays Fiscal Strength Indices employ fundamental measures to adjust the weightings of sovereign issuers in the indices. The Citi RAFI (Research Affiliates Fundamental Index) Bond Index Series weights each country in an index by economic footprint, as determined by four equally weighted fundamental factors that serve as proxies for a country’s ability to service debt.

**IMPLICATIONS FOR PORTFOLIO RISK MANAGEMENT AND PERFORMANCE MEASUREMENT**

Regardless of which one an investor chooses, for an index to be a valid benchmark it must have certain properties: It must be clearly defined, measurable, consistent with the manager’s expertise, and investable (at least in theory).² “As a sponsor, you want to pick an index that reasonably represents the risk characteristics that you want the manager to follow,” says Kopprasch, who provides a perspective from both sides of the fence—prior to serving as managing director of Yield Book, he served as a portfolio manager for large institutional clients. Kopprasch cautions against delegating the responsibility of fixed-income risk management to the benchmark provider. Investors must understand not only the index weighting scheme but also the rules by which index constituents are added and removed. Indices have different rules for issue characteristics such as quality, liquidity, maturity, and where bonds are domiciled. Index providers may categorize an issue based on the highest rating assigned by rating agencies, the lowest rating, or even the average rating. A bond rated BBB-/BB+, for example, may be defined as investment grade (BBB– or higher) by an index provider, but an investor with a more conservative posture may categorize that bond as high yield.³ “Is this a risk exposure an investor wants to delegate to the index? Probably not,” says Kopprasch.

The opposite of delegating too much responsibility to an index is an investment policy that is overly precise, Kopprasch says, such as a fixed-weight benchmark. An investor who sets a fixed-weight benchmark of 45% MBS/45% corporate/10% government in an effort to maintain an overweight to non-Treasury sectors may find the policy backfires when a manager is forced to pare back a sector that has performed strongly, simply to adhere to policy.⁴ Even seemingly small restrictions, such as slight differences in quality or maturity exposures relative to a benchmark, can significantly limit a manager’s opportunity set and performance compared to the benchmark. In such a case, a subindex matching the quality constraint would be more appropriate. All major index providers offer many variations of their main indices. Citigroup, for example, offers more than 10,000 variations of its main indices, including the Citigroup BIG (Broad Investment Grade) Index and the World Government Bond Index, as well as a website that allows clients to create custom indices for their own use.

**CONCLUSION**

Alternative weighting schemes may address some of the problems with cap-weighted indices, but these weighting schemes have drawbacks as well. Investability of an index is usually achieved at the expense of index breadth—that is, an index with fewer issues is less reflective of the overall market it seeks to represent. Conversely, as index breadth expands, investability decreases. Indices that are not market value weighted may need to be rebalanced regularly; more frequent trading can create more transaction costs. Some weighting schemes based on factors or alternative risk exposures may be perceived as being superior to market value weighted indices, in theory, but in practice, they can often be less investable solutions, says Brian Upbin, CFA, CAIA, head of benchmark index research for Barclays. Upbin offers this advice for
investors who are thinking about alternative weighting schemes: “When choosing an alternative theme, investors should choose a theme that mirrors how they think about the market. They should evaluate which risk factors are important to them and whether the alternative index captures these risk exposures.” Upbin says investors may find that alternative weighting schemes are most useful from an informational rather than a practical basis.

Upbin also points out the merits to a market value–weighted index. “A market value–weighted index is an objective measure of what the investment choice set looks like,” says Upbin. “When most investors think of fixed-income beta, they are generally thinking of a market value–weighted index as a measure on their investment universe.” These indices are also transparent and rules based, so investors have full knowledge of the securities in the index and can anticipate changes to the index. Upbin also says that the perceived drawbacks to a market value–weighted index are often oversimplified. The largest issuers tend to be more liquid credits, which facilitates investability.

Once an investor has chosen an index as a benchmark, investment policy must be applied thoughtfully. “Guidelines must be written with an eye toward intelligent risk management in the future,” advises Kopprasch. Setting absolute limits, such as limiting BBB-rated security exposure to 5% or less of a portfolio benchmarked to an investment-grade index, is a poor interpretation of a benchmark. If an investor is going to set limits, Kopprasch suggests that limits relative to a benchmark make more sense than absolute limits because relative limits self-adjust in reference to changes in the index. Both Kopprasch and Upbin advise investors to rely on portfolio manager judgment and strategy instead of relying on an index to set risk exposure limits. Investors should be aware that all indices have biases and tradeoffs, and no index is universally appropriate for all investors. Overall, a well–chosen benchmark coupled with intelligent guidelines provides the optimal framework for portfolio risk management and performance measurement.

NOTES
1. Siegel, page 90.
2. In “Evaluating Portfolio Performance,” Bailey et al. list seven “properties of a valid benchmark.” The other three are 1) “reflective of current investment opinions (the manager has current investment knowledge . . . of securities or factor exposures within the benchmark,” 2) “specified in advance,” and 3) “owned (the investment manager should be aware of and accept accountability for the constituents and performance of the benchmark. It is encouraged that the benchmark be embedded in and integral to the investment process and procedures of the investment manager).”

REFERENCES


Deborah Kidd, CFA, is senior vice president at Boyd Watterson Asset Management, LLC.