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Investment Grade Bonds

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Few question whether investment grade bonds provide substantial portfolio benefits. High quality bonds have historically been used as "anchors to windward" in diversified portfolios. However, some investors debate how best to structure an investment grade bond portfolio.

In this paper, we briefly discuss the diversification benefits of investment grade bonds. We then discuss the effectiveness of using a popular broad bond index—the Bloomberg Barclays Aggregate—and its composition methodology as the basis for the fund's approach. Specifically, the paper describes the history of the index, its composition, and some of the changes it has undergone over time. Furthermore, it outlines the index's strengths and weaknesses, and proposes possible alternatives.

Despite several known drawbacks related to the index's composition, we recommend the use of the Bloomberg Barclays Aggregate over several common alternatives for most investors except those pursuing an asset-liability matching approach to portfolio management.

An anchor to windward

The role of a fund's investment grade bond portfolio is to dampen volatility, provide diversification benefits (especially during a crisis), and to offer a reliable source of liquidity.

Most institutional funds are dominated by equities and other risky assets because investors expect those assets to deliver, over the long term, returns that meet the objectives of those institutions. On the downside, high returns from equities are accompanied by high volatility, so equity-dominated portfolios can suffer severe declines during periodic, inevitable short-term crises. To mitigate this risk, a well-constructed fund can allocate to assets such as investment grade bonds. These assets can also be a source for any required outflows during such periods, providing equities time to recover.

Central banks such as the US Federal Reserve often lower interest rates in response to a sharp equity market downturn, intending to stimulate the economy, and, in the

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process, increase the value of bonds. Investment grade bonds are expected to retain value or appreciate in such periods, and have done so historically. In the five historical bear markets examined below, investment grade bonds either maintained their value or appreciated.

Historical Scenario	Investment Grade Bonds	US Equities
Global Financial Crisis (Oct 2007 – Mar 2009)	9.3%	-43.8%
Popping of the TMT Bubble (Apr 2000 – Sep 2002)	28.6%	-43.8%
LTCM (Jul – Aug 1998)	1.8%	-15.4%
Crash of 1987 (Sep – Nov 1987)	2.2%	-29.5%
Stagflation (Jan 1973 – Sep 1974)	7.9%	-42.6%

TABLE 1
Cumulative Returns[1]

[1] US Equities are represented by the S&P 500.

History of the Bloomberg Barclays Aggregate

In 1973, Lehman Brothers established the Lehman Government/Corporate index as a proxy for the domestic investment grade bond market. By the mid-1980s, as the market for mortgage-backed securities matured and these issues were included in most investment grade bond portfolios, a more complete and representative index was needed.

To meet this need, the Lehman Aggregate Index was established in 1986, with a history backfilled to 1976. The index was essentially an extension of the Lehman Government/Corporate index, as it simply added mortgage-backed securities. The index further evolved to include asset-backed securities (ABS) in 1992 and commercial mortgage-backed securities (CMBS) in 1999.

Following Lehman Brothers' bankruptcy and subsequent takeover by Barclays in November 2008, many of the Lehman indices were rebranded under the Barclays label, though their functions have remained the same. In 2016, Bloomberg acquired the Barclays family of indices, and hence it was re-named again. The Bloomberg Barclays Aggregate Index remains the dominant fixed income benchmark used by most investment grade bond managers in the United States.

Bloomberg Barclays Aggregate: Composition

Containing over 10,000 individual securities of several hundred issuers, the Bloomberg Barclays Aggregate is a market-weighted representation of the investment grade, domestic bond market.[2] In particular, the Bloomberg Barclays Aggregate index is composed of four major types of fixed income securities: US government and government-related securities (e.g., Treasuries and agencies), corporate and non-corporate credit securities, residential and commercial mortgage-backed securities, and asset-backed securities.[3]

[2] To be considered investment grade, a security must achieve a rating of at least Baa3, BBB-, or BBB- from credit agencies such as Moody's, Standard & Poor's, or Fitch Ratings respectively.

[3] Non-corporate securities generally refer to debt issued by regional governments, international organizations, or supranational unions (e.g., the IMF or the European Union).

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Government and government-related securities

United States Government securities serve as the primary debt financing instruments of the government. The two main types of government securities included in the Bloomberg Barclays Aggregate are Treasury notes and long-term Treasury bonds. Maturities range from one year on certain Treasury notes to thirty years on Treasury bonds. Government-related securities include primarily US Agency debt issued by certain Government-Sponsored Enterprises (GSEs) such as Fannie Mae and Freddie Mac. These debentures are *not* mortgage-backed securities; instead, they are debt issued by GSEs to fund their financial operations.

Most investors consider the likelihood of a US Government or government-related bond defaulting to be extremely low. However, the holder of a nominal Treasury or agency security does bear interest rate and inflation risks.

Corporate and non-corporate credit securities

Like the federal government and government-sponsored enterprises, investment grade corporations and other non-governmental entities issue bonds to finance debt. Since these entities are usually considered to have a higher chance of default, their bonds usually offer higher interest payments compared with Treasuries (or agencies) of similar maturity.

Residential and commercial mortgage-backed securities

A mortgage-backed security is a security whose value and fixed income payments are derived from a pool of underlying mortgages. In the case of residential mortgage-backed securities (RMBS), government-sponsored enterprises write and then group individual mortgages into financial instruments through a process known as securitization. They then sell these mortgage-backed securities to investors and use the proceeds to repeat the process. In the case of commercial mortgage-backed securities (CMBS), the packaged mortgages are written on commercial property—not residences. In theory, bundling multiple mortgages together diversifies the underlying credit risk (because each underlying mortgage represents only a small fraction of the entire pool of assets). Since these vehicles have traditionally exhibited credit risk and pre-payment risk, they usually offer higher interest payments compared with Treasuries (or agencies).

Asset-backed securities

Similar to a mortgage-backed security, an asset-backed security is a security whose value and fixed income payments are derived from a pool of underlying assets. However, as opposed to mortgage-backed securities, in this case private companies securitize a variety of paying assets, including credit card payments, automobile loans, home equity loans, and small business loans. Once again, since these vehicles may default, they usually offer higher interest payments compared with Treasuries (or agencies).

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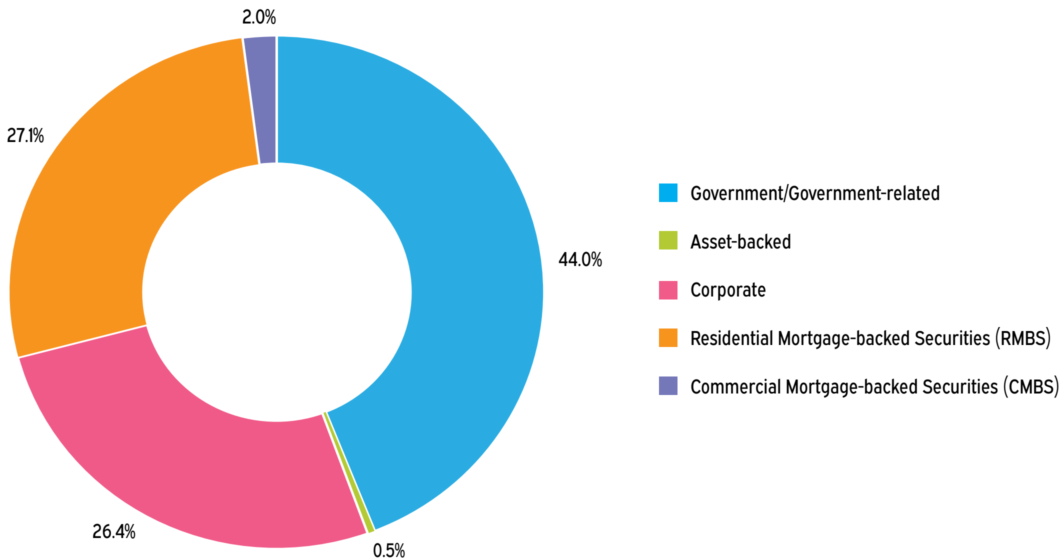

FIGURE 1
Composition of Bloomberg Barclays Aggregate Index (as of December 2019)

Figure 1 shows the current composition of the Bloomberg Barclays Aggregate. As of 2019, the two largest categories were government and government-related bonds and residential mortgage-backed securities (RMBS). This was not always the case. In fact, RMBS used to constitute a dramatically smaller percentage of the index. However, since the advent of securitization, mortgage debt in the United States has exploded—and that explosion has been incorporated into the index. Figure 2 shows the relative growth of the RMBS sector from its humble beginnings in 1983 when it constituted only 13.9% of the index. It peaked at the advent of the Global Financial Crisis, and it has declined as a proportion of the index since.

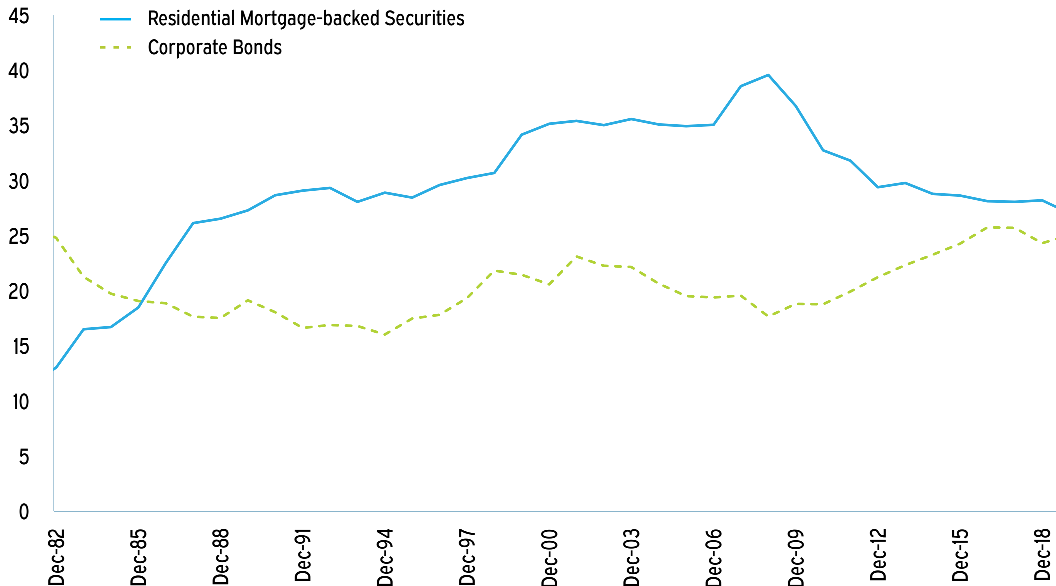

FIGURE 2
RMBS Percentage of Bloomberg Barclays Aggregate Index Since 1983

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Note that while the size of the mortgage sector grew, the size of the corporate bond sector has generally remained steady over the past thirty-seven years. In 1983, corporate securities made up 24% of the index. Since then, the number has fluctuated between 17% and 26% of the index. Meanwhile, the asset-backed securities sector has hovered around 1% or less since it was incorporated into the Bloomberg Barclays Aggregate index in the early 1990s.

Pros and cons of using a market-weighted approach

There are several ways in which a fund may structure its investment grade bond allocation. First, a defined benefit fund may attempt to match the return stream from its investment grade bond investments to the fund's particular liability structure. Second, a fund may set targets for sector weighting, average quality, and duration to express strategic or tactical views. Finally, a fund can invest passively or actively in a broad investment grade bond mandate, using a benchmark like the Bloomberg Barclays Aggregate Index.

> Though not without shortcomings—mainly driven by composition drift—an investment in a portfolio resembling the Bloomberg Barclays Aggregate index will satisfy the overall goals of a bond portfolio: diversification, stability, and liquidity.

The primary argument for structuring an investor's bond allocation to resemble the Bloomberg Barclays Aggregate is the diversification it provides within the bond portfolio. An investor mirroring the index's composition gains exposure to all major sectors of the investment grade bond market (with the exception of TIPS) and achieves diversification by issuer and industry, which significantly reduces volatility and event risk. In addition, the Bloomberg Barclays Aggregate is the most popular broad investment grade index, used by the vast majority of institutional investors and active investment grade bond managers as a benchmark.

The primary disadvantage of using a market-weighted index like the Bloomberg Barclays Aggregate as a benchmark or passive approach is an inability to manage the allocation's overall risk level. That is, as the composition of the aggregate bond market changes, the fundamental characteristics of the index change as well. These changes do not necessarily align with the needs of most investors. The following are just a few historical trends:

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Decrease in average quality

In 1995, the percentage of the Bloomberg Barclays Aggregate Index in the highest quality securities (those rated "AAA") was 85%. By 2019, AAA rated bonds constituted 71% of the index. At the same time, the percentage of BBB-rated bonds (the lowest-quality bonds considered investment grade) in the index increased to 12% by December 2019.

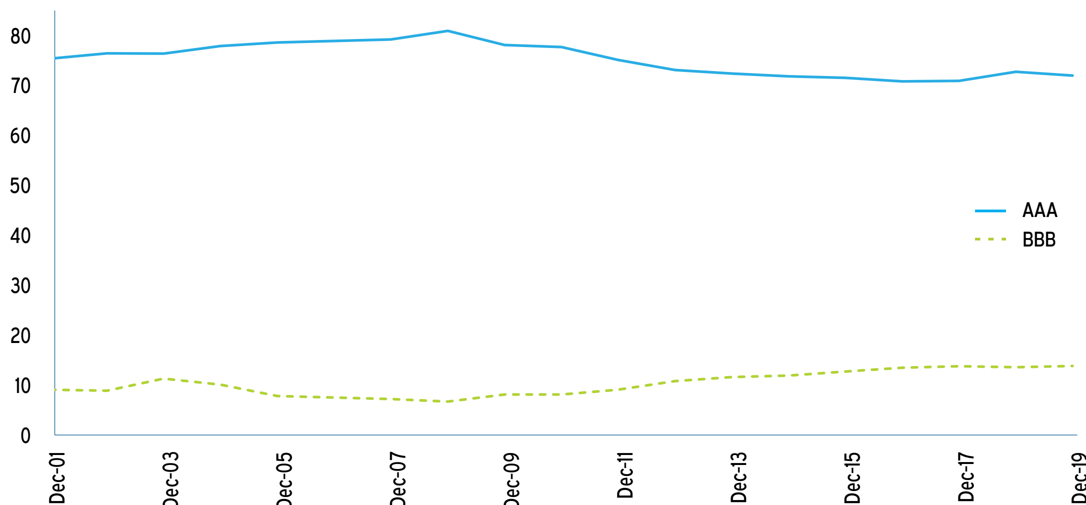

FIGURE 3
Credit Quality Percentage of Bloomberg Barclays Aggregate Index Since 2001

Change in average duration

From 1976 to 2019, the index's duration has seen many changes, the vast concentration of them in the last 20 years. The index hit a record low duration of 3.7 years in 2008, but it has exhibited a steady increase since, recording a high of 5.9 years in 2017.

The decline in duration during the 2000's was primarily due to the increasing percentage of mortgage-backed securities in the index (and offsetting the effects of gradually declining interest rates). On the other hand, the rise in duration since the GFC was led by an increase in corporate and Treasury bond issuance with longer maturities. The higher average duration has resulted in an increase in the level of sensitivity to changes in interest rates.

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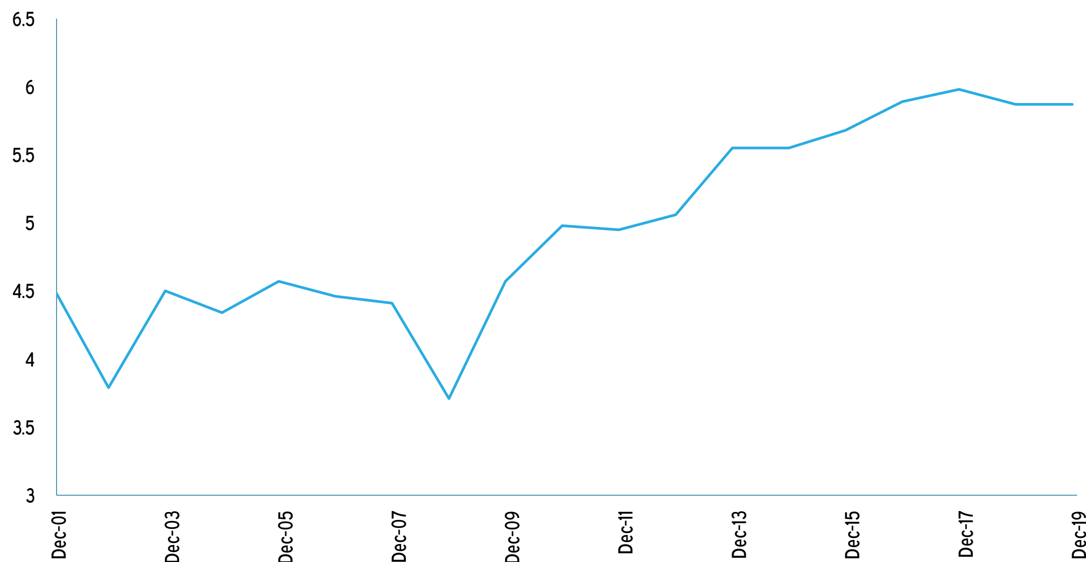

FIGURE 4
Duration of Bloomberg Barclays Aggregate Index Since 2001

Increase in real estate and asset-backed exposure

The large increase in RMBS, CMBS, and ABS beginning in the 1980s, and continuing through the 1990s, added explicit exposure to relatively esoteric areas of the broader bond market.

Nevertheless, these three changes have not led to a noticeably higher correlation to US equities, as seen in Figure 3. Instead, over the last thirty years, the Bloomberg Barclays Aggregate index has displayed an unpredictable relationship with equities. Though, on average, the correlation to equities is low, it is volatile and has provided varying levels of diversification benefits.

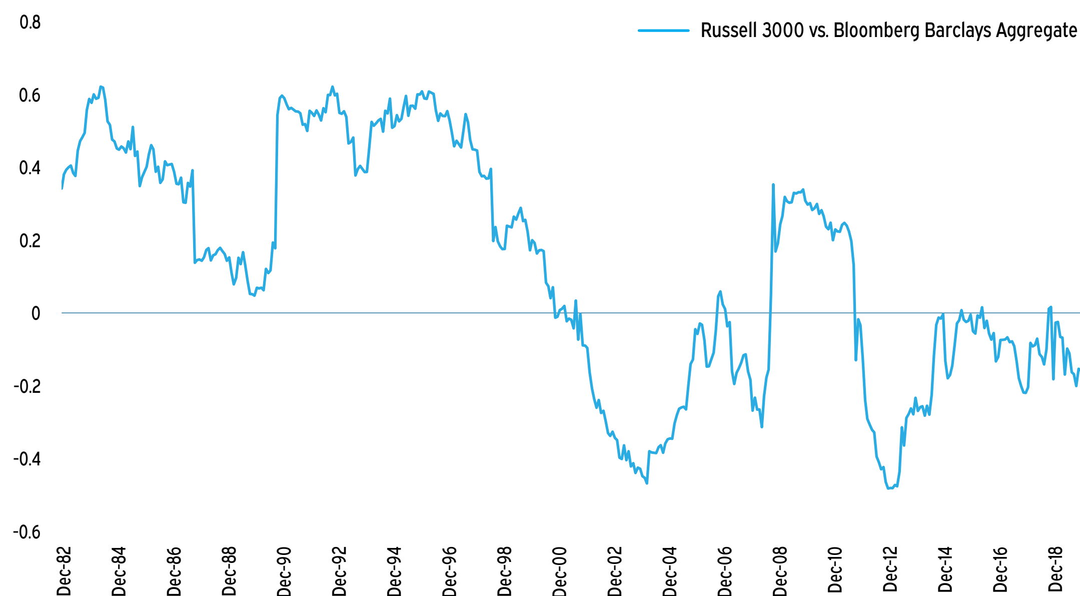

FIGURE 5
36-Month Rolling Correlation: Bloomberg Barclays Aggregate versus Russell 3000

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A secondary disadvantage of using a market-weighted bond index (in this case as a benchmark for active management) is that active managers are induced to outperform it by taking more risk than the index, as opposed to individual security selection, which is considered difficult in this space. For example, many managers in 2007 to 2008 reached for yield in "investment grade" subprime residential mortgage-backed securities, which subsequently suffered dramatic losses. In other cases, managers take on illiquidity risk, which undermines one of the primary roles of a fund's investment grade holdings. Many active managers explicitly state that they seek to outperform by owning a greater proportion of higher yielding (and riskier) securities. In general, a fund should be vigilant in monitoring the portfolio risk of any active bond manager benchmarked to a market-weighted investment grade bond index.

The Bloomberg Barclays Aggregate also suffers from the fact that it provides an incomplete picture of the domestic investment grade bond market. That is, the Bloomberg Barclays Aggregate does not include TIPS, private corporate issues, eurobonds (bonds issued overseas by US companies in US dollars), non-agency mortgage backed securities, private mortgage-backed securities, and issues smaller than $300 million.[4] By contrast, the Bloomberg Barclays Universal index is a more comprehensive index, but its inclusion of high yield bonds makes it an inappropriate proxy for an investment grade bond allocation.

[4] For most of these instruments, the decision to exclude them from the index has a solid basis. For example, TIPS have very different risk and return characteristics, and the lack of liquidity for smaller issues prevents most managers (and therefore plan sponsors) from owning them. On the other hand, the decision to exclude eurobonds appears to be somewhat arbitrary. As of 2019, the index included Yankee bonds, which are bonds issued by foreign companies in the United States in US dollars. The risks of a bond are probably more connected with the country of origin of its issuer rather than with the market in which it is issued.

Alternatives to a market-weighted approach

The following section briefly discusses alternative methods of structuring a fund's fixed income allocation.

Separating government and credit

An argument can be made that funds should separate government and credit exposure. In general, this argument hinges on the desire of the investor to strategically or tactically tilt the fund toward or away from government securities. From a strategic perspective, a government-only index has historically displayed more desirable characteristics, such as a higher overall Sharpe ratio and a lower correlation with equities (see Table 1). A government-only index will typically yield less, but may offer increased volatility dampening, diversification, and liquidity. On the other hand, concern about the potential for rising government credit risk may give some investors pause.

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	Bloomberg Barclays Government Index	Bloomberg Barclays Credit Index
Performance [5]	7.0%	7.7%
Standard Deviation	5.3%	7.3%
Sharpe Ratio	0.43	0.40
Correlation with Russell 3000	0.06	0.29

TABLE 2
Government vs. Corporate Bond Annualized Performance

[5] Data is for the period from January 1973 through December 2019.

Sector and duration targets

Another method for bond portfolio construction is a system in which sector weighting, quality, and duration targets are created for the various major investment grade bond market segments (including credits, mortgages, Treasuries, TIPS, etc.). Using static targets for each desired bond market segment eliminates the portfolio drift that naturally occurs over time as discussed above.

In practice, this could be implemented either through hiring separate bond managers for each market segment or through the creation of very specific guidelines for one or more bond managers. Hiring specialist managers may be a prudent approach for finding the most skilled active managers, but this approach is typically available only to fairly large investors. However, such an approach restricts active portfolio managers by not allowing them to rotate among and take advantage of perceived opportunities in the different sectors of the bond market.

Asset-liability matching

Asset-Liability Matching seeks to match the duration of a pension fund's bonds with its long-term liabilities. While not relevant for many plans, some defined benefit plans that use a separate discount rate and are close to being fully funded may benefit from an asset-liability matching structure. By matching the duration of the fund's assets to its liabilities, the fund reduces fluctuations in its funded ratio.[6]

[6] See our separate paper on Liability Driven Investing for more detail.

Conclusion

Structuring an investment grade bond portfolio to track the Bloomberg Barclays Aggregate Index is an effective way for an investor to achieve diversification and stability in the broad bond market. Though not without shortcomings—mainly driven by composition drift—an investment in a portfolio resembling the Bloomberg Barclays Aggregate index will satisfy the overall goals of a bond portfolio: diversification, stability, and liquidity. Alternatives do exist, however, and investors should evaluate with the help of their consultant whether a different structure for their investment grade bond portfolio is warranted.

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