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Worth the risk? The appeal and challenges of high-yield bonds

Vanguard research

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Executive summary. High-yield bonds¹ have unique characteristics when compared with traditional fixed income products. Representing the debt financing of companies rated below investment grade by the primary rating agencies (Ba or lower for Moody's Investor's Service, BB+ or lower for Standard & Poor's), they carry higher issuer risk. As a result of the increased probability for default, they have traditionally offered yields above those offered by investment-grade bonds. In addition, they offer the chance for significant price appreciation should the issue or issuer be upgraded by the credit-rating agencies. Given these characteristics, is there a place in a diversified portfolio for high-yield bonds?

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The analysis begins with an overview of the high-yield bond market, including its size, the dynamics of spreads, and its unique risk characteristics. Next, high-yield bonds are evaluated in terms of their potential role in a diversified portfolio, focusing on the investment characteristics of the market and the challenges associated with incorporating them into an investment strategy.

¹ This analysis focuses on taxable high-yield bonds, not high-yield municipal bonds (revenue bonds and general obligation bonds issued by local and state municipalities that carry below-investment-grade ratings). Because investors generally have different motivations for investing in tax-exempt bonds, we consider them beyond the scope of this paper.

This analysis concludes that:

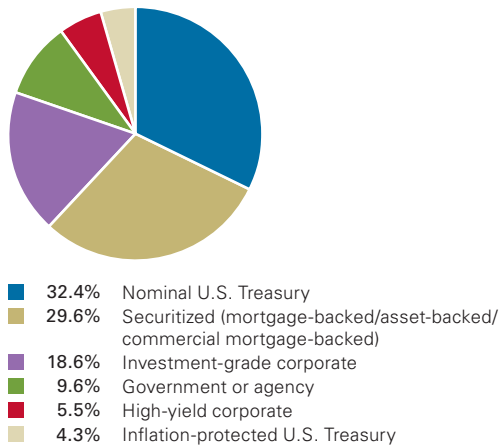
- High-yield bonds reflect characteristics of both the equity and fixed income markets.
- On average, they have outperformed versus higher-quality fixed income securities except during periods characterized by low relative credit spreads.
- Illiquidity and lack of transparency in the high-yield market are critical considerations for investors.
- After accounting for liquidity and investability, we found that high-yield bonds on average would not have improved the risk and return characteristics of a traditional balanced portfolio.

The high-yield bond market, popularized in the 1980s, consists of bonds considered to have a greater risk than others of not paying interest and/or principal on a timely basis. Issues include those from capital-intensive companies at risk of not meeting obligations, newer companies looking to refinance potentially higher-cost bank or private loans, and growing companies entering the debt markets for the first time. High-yield bonds may also have been issued by “fallen angels”—companies whose bonds have been downgraded from investment-grade status because of increased risk to interest and/or principal payments, often as a result of underperforming businesses.

High-yield bonds are excluded from investment-grade indexes such as the Barclays U.S. Aggregate Bond Index, which may be reason enough for investors who desire full market exposure to allocate a portion of their bond portfolio to the sector. However, as demonstrated in **Figure 1**, these bonds account for only a small portion of the U.S. taxable fixed income market—5.5% as of June 30, 2012 (23% of the total U.S. corporate bond market). In addition, many investors view high-yield or “junk” bonds with a skeptical eye and therefore purposely exclude them from their standard allocations to fixed income investments.

Notes on risk: All investing is subject to risk, including the possible loss of the money you invest. Bond funds are subject to the risk that an issuer will fail to make payments on time, and that bond prices will decline because of rising interest rates or negative perceptions of an issuer’s ability to make payments. High-yield bonds generally have medium- and lower-range credit quality ratings and are therefore subject to a higher level of credit risk than bonds with higher credit quality ratings. Past performance is not a guarantee of future results. The performance of an index is not an exact representation of any particular investment, as you cannot invest directly in an index. Current and future portfolio holdings are subject to risk. Diversification does not ensure a profit or protect against a loss.

Figure 1. Relative size of the U.S. high-yield bond market



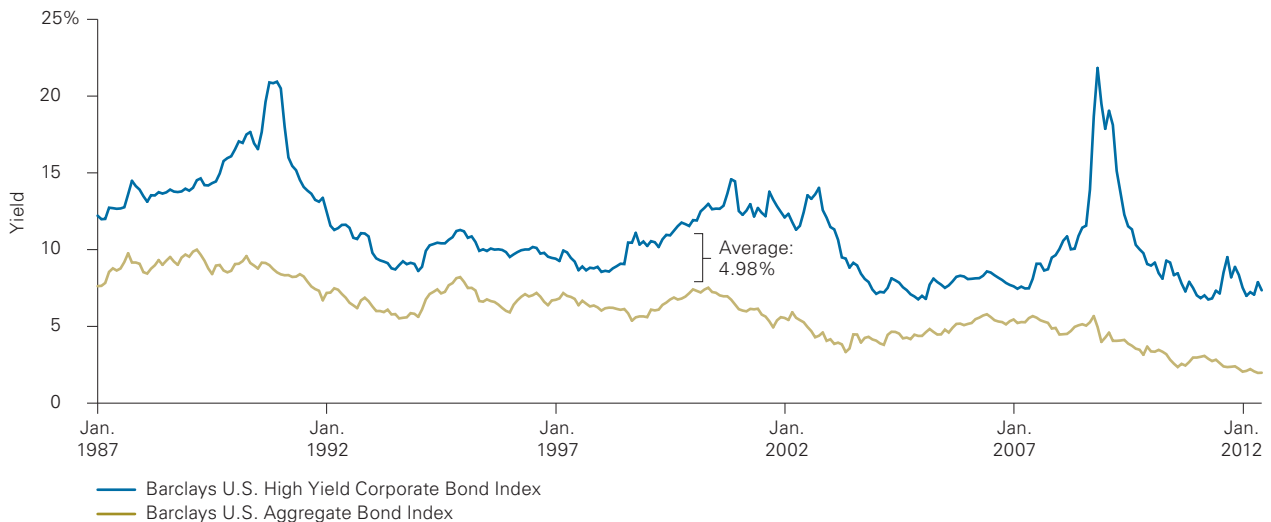
Notes: If “float-adjusted” for agency and securitized securities closely held by the Treasury and Federal Reserve as part of the federal government’s response to the financial crisis in 2008–2009, the percentages change to the following: nominal Treasury, 34.3%; securitized, 26%; investment-grade corporate, 19.6%; government/agency, 9.7%; high-yield corporate, 5.8%; and inflation-protected Treasury, 4.6%.

Source: Barclays. Values represent market values of indexes as of June 30, 2012.

As their name implies, high-yield bonds offer a higher yield than investment-grade bonds as compensation for investors bearing the extra risk of default (the risk that the firm cannot pay back the obligations to the bondholders) or downgrade (the risk that the firm’s financial footing weakens to the point where the credit rating agencies downgrade its bonds to a more speculative level) associated with lesser-quality issues or issuers. This premium can be seen in **Figure 2**. However, although these bonds offer a yield premium, they do not always compensate investors for the higher embedded risks in the form of higher *total returns*.

Figure 3, on page 4, shows a series of scatter plots representing a starting yield spread for the Barclays U.S. High Yield Corporate Bond Index versus the Barclays U.S. Aggregate Bond Index and the subsequent one-, three-, five-, and ten-year performance differentials between the two indexes. If higher yields always led to positive excess returns, all the points would reside above the x-axis.

Figure 2. High-yield bonds offer a premium to investment-grade bonds

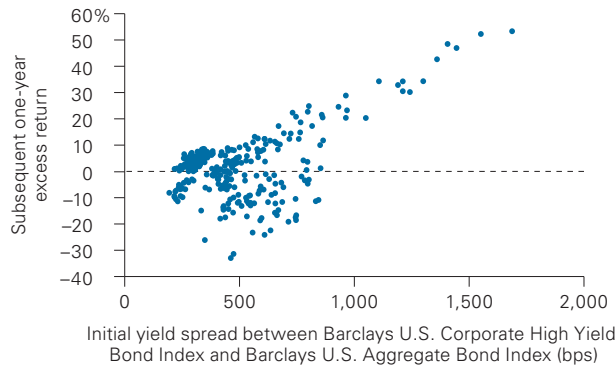


Notes: Yield data as of June 30, 2012, beginning January 1987. Relationship holds if evaluated versus the 10-year U.S. Treasury bond. The average spread versus the 10-year U.S. Treasury bond has been 5.38%.

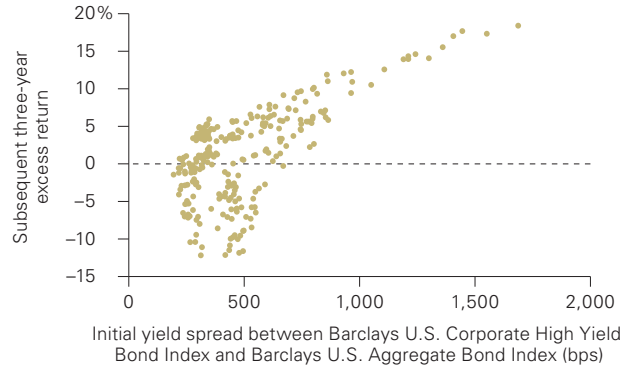
Sources: Vanguard calculations, using data from Barclays.

Figure 3. Positive yield spread has not always led to positive excess returns

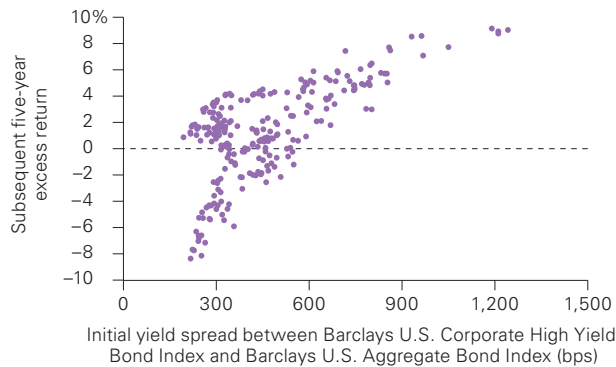
a. One-year relationship



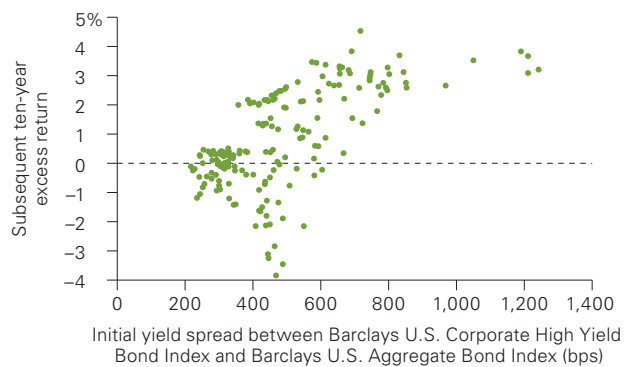
b. Three-year relationship



c. Five-year relationship



d. Ten-year relationship



Notes: Yield data as of June 30, 2012, beginning January 1987. Analysis was replicated using the 10-year Treasury bond as the benchmark, with nearly identical results.
Source: Vanguard calculations, using data from Barclays.

Although there is a positive relationship (higher starting yields do increase the probability of realizing a positive future excess return versus the broad investment-grade market, particularly during periods of high initial yield spreads), it's important to note that a positive spread has not always translated into positive excess returns.² This has been true even over extended periods, particularly when starting spreads have been less than approximately 600 basis points. Given the uncertain nature of compensation for bearing default risk, do high-yield bonds offer characteristics that are unique and attractive enough to warrant an allocation in investors' diversified portfolios?

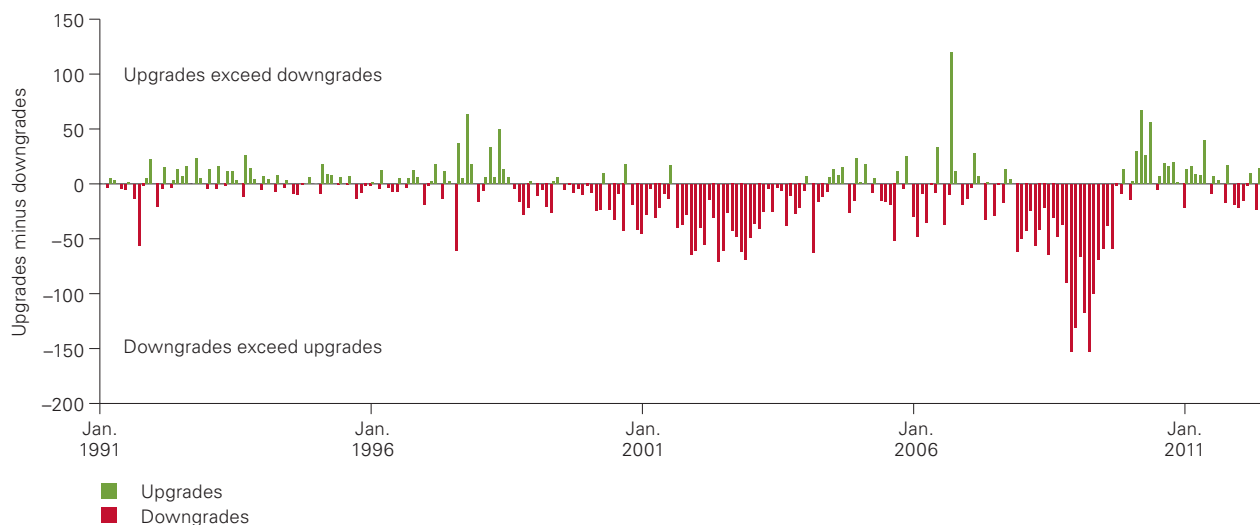
Unique risks

High-yield bonds' below-investment-grade rating implies increased credit risk and an expectation of higher average returns or yields. The first risk is that a bond will be downgraded because of worsening prospects for its issuer's ability to adequately manage its outstanding liabilities. **Figure 4**, on page 5, shows net monthly ratings upgrades and downgrades since 1991 (the start of our individual issue data). Since 1999, downgrades have outpaced upgrades, often significantly. To be sure, this period was characterized by two equity bear markets; however, even from 2003 through 2007 (a bull

² Note also that this relationship may not hold for individual bonds. In general, the greater the yield, the greater the default risk.

Figure 4. The ratio of upgrades to downgrades can offer insight into industry fundamentals

Net upgrades versus downgrades in Barclays U.S. Corporate High Yield Bond Index: January 1991–May 2012



Note: Upgrades or downgrades are determined by a change in an issue's Moody's rating from one month to the next.

Sources: Vanguard calculations, using data from Barclays.

market), downgrades still outnumbered upgrades in most months. Of course, downgrades can be symptomatic of an enduring problem at a given firm. For example, Moody's Investors Service has shown that since 1983, the median defaulted bond has had a B1 rating 60 months before default and ultimately ended up with a rating of Caa2 (four rungs lower on the scale) just before default. Whether or not an investor can capitalize on such a trend is questionable, because the downgrade is often just the result of problems that the market has already recognized and priced in.

Although changes to a bond's rating can be damaging, the ultimate risk is that of default. Figure 5, on page 6, shows that since 1920, the default rate within the high-yield market has both exceeded that of the investment-grade market by a significant margin and experienced significant volatility over time. This volatility has become much more noticeable since the 1980s, when the issuers' characteristics changed from primarily fallen angels

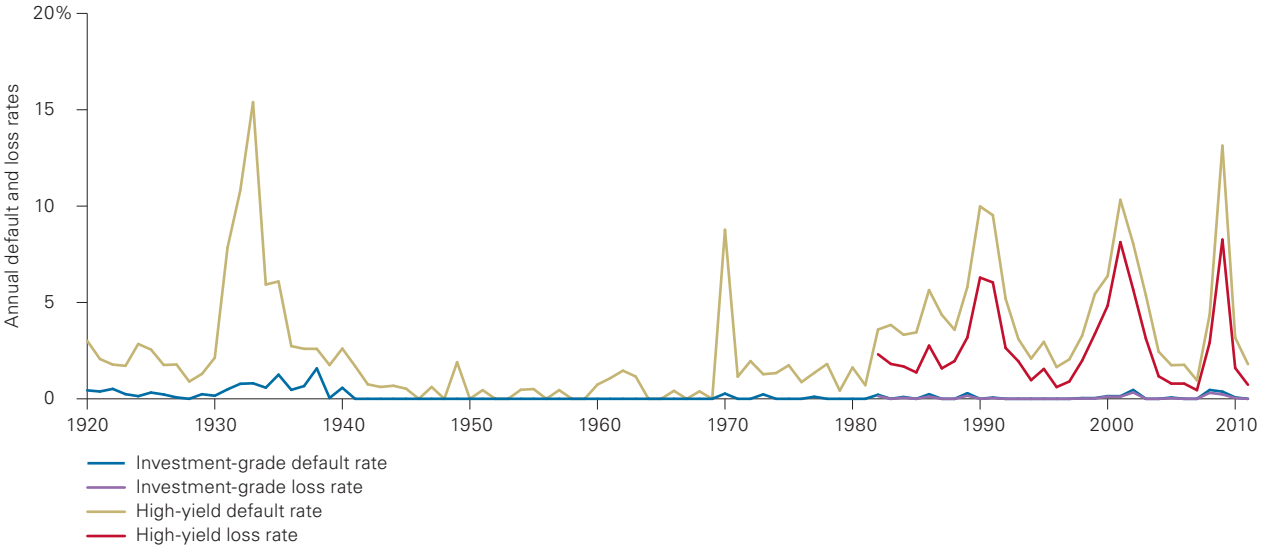
to mostly new firms seeking debt financing for the first time. As discussed by William J. Bernstein,³ these new companies tend to be riskier, with less financial stability than fallen angels. For example, according to Moody's, between 1982 and 2010, bonds rated Caa-C had a cumulative credit loss of 35% over the five years following a default event. In contrast, bonds rated B lost 16%, and bonds rated Ba lost 7%. These statistics suggest that the higher the quality of a defaulting issue, the greater the recovery rate of lenders' principal.

Perhaps even more significant to the investor is the loss rate (the value of a given default that is not recovered during bankruptcy proceedings).⁴ While the data on losses are not as extensive as those on defaults, it's clear that losses on high-yield bonds have been significant. The implication is that investors collectively have not realized the reported yield on average over time, nor have they benefited on average from declining yields. Figure 6, on page 6, demonstrates this by comparing average

³ See Bernstein (2001).

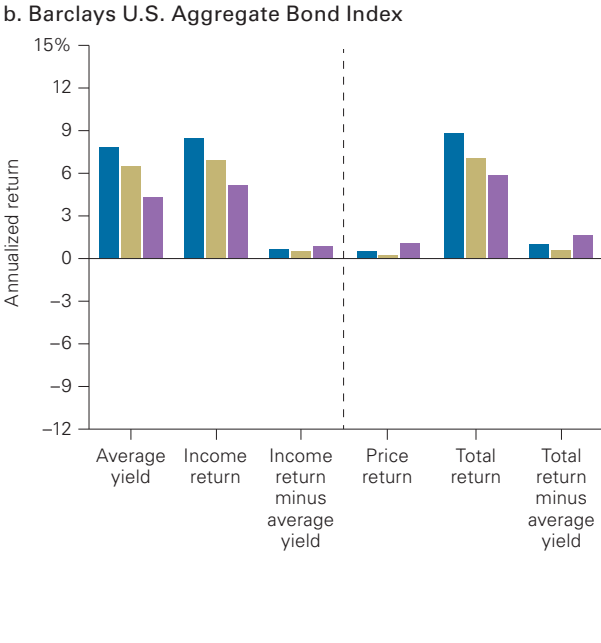
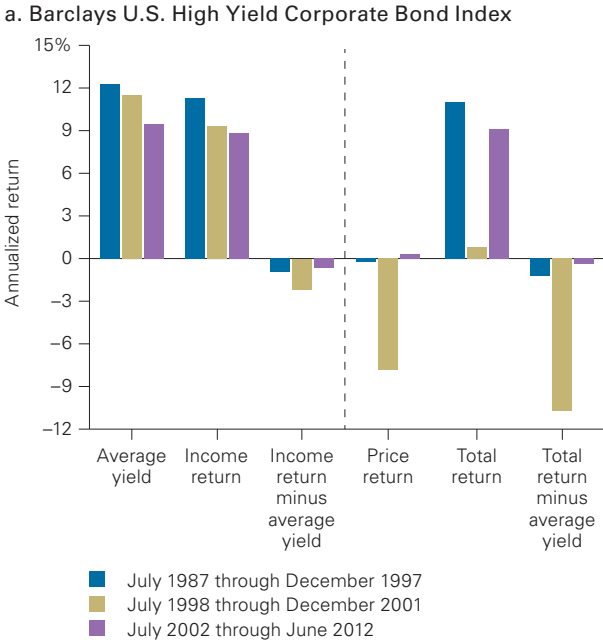
⁴ Not all defaults end up in bankruptcy court. Some issuers may reach repayment or restructuring agreements with their lenders.

Figure 5. The default risk for high-yield and investment-grade bonds



Note: Default and loss rates are issuer-weighted. Data as of December 31, 2011.
 Source: Moody's Investors Service.

Figure 6. The impact of default losses



Note: Analysis covers the period July 1987–June 2012.
 Sources: Vanguard calculations, using data from Barclays.

yield with average annual return (for further comparison, we also show data for the Barclays U.S. Aggregate Bond Index).

We split the return history into three segments: two periods of relatively normal relationships between price return and income return, and one, 1998–2001, in which high-yield bond prices took a meaningful, unrecovered hit. While this period affects the reported total returns over the entire series, it's important to note that even during the first and third periods, the total return lagged the average yield, a likely result of the loss rate associated with high-yield bond defaults. If losses were not an issue, it might be reasonable to expect income and total returns to be on par with or even exceed average yield in a period of generally declining interest rates as shown in **Figure 6b**.

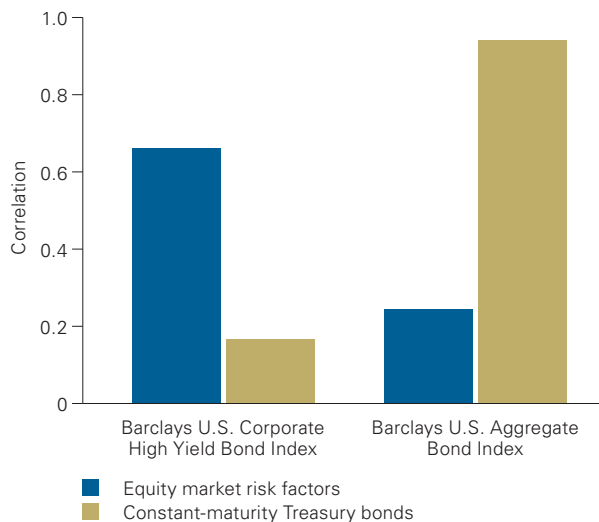
One additional feature that can help to explain why returns have on average trailed yields is callability. Many high-yield bonds are issued with a call feature so that if market rates fall enough, the issuer can replace the bond with one that has more favorable terms. The call feature effectively puts a cap on the price of a given bond (prices move in the opposite direction of yields). As of July 31, 2012, 94% of bonds in the Barclays U.S. Corporate High Yield Bond Index had a call feature.⁵

Unique characteristics

Although high-yield bonds are debt instruments, their return characteristics could classify them as a hybrid asset class in the eyes of many investors. Because of the default risk associated with the firms and securities that constitute their market, these bonds experience risk and return characteristics more commonly associated with equities. This is in contrast to investment-grade bonds, which are primarily driven by the movements of the U.S. Treasury yield curve. **Figure 7** compares the correlation of both high-yield bonds and investment-grade bonds to movements in the Treasury yield curve (represented by the returns for a variety of

Figure 7. High-yield bonds show high correlation to equity risk factors

Correlation of high-yield and investment-grade bonds to equity and fixed income risk factors



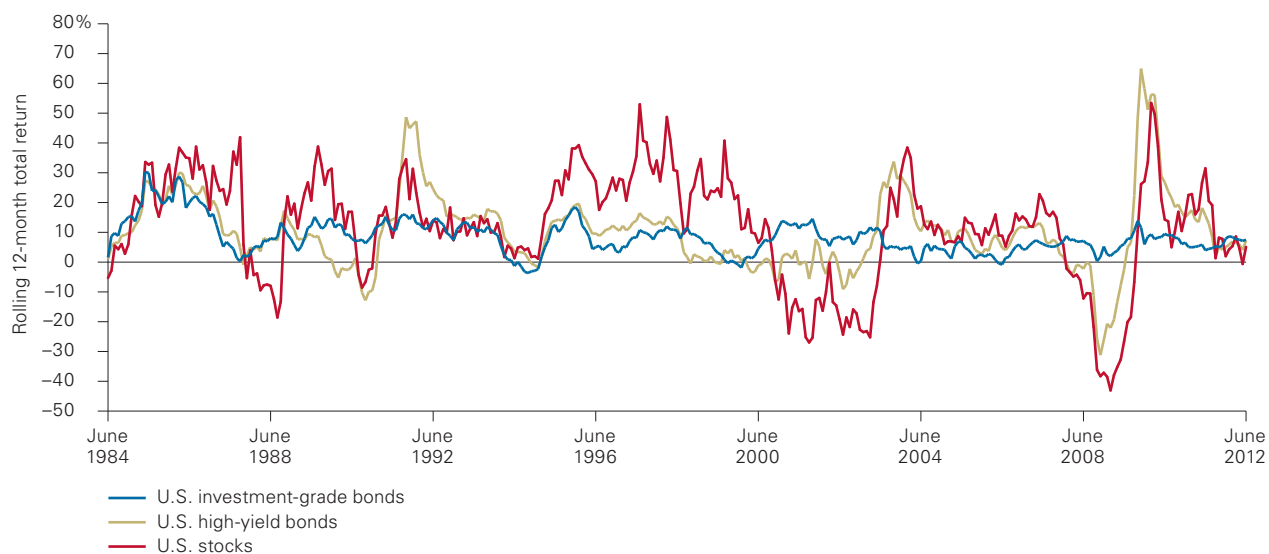
Notes: The correlations shown are the result of a multiple regression analysis on the factors identified. Using alternative regression statistics, the adjusted R-square for the Barclays U.S. Corporate High Yield Bond Index versus the Fama-French factors was 0.432 and versus the constant-maturity Treasury bonds was 0.01. For the Barclays U.S. Aggregate Bond Index, the r-square statistics were 0.05 and 0.89, respectively. High-yield bonds showed a strong relationship to the equity market risk factor, with a t-statistic of 14.57. The most significant relationship over the yield curve was to the 10-year Treasury bond, but with a much lower t-statistic of 2.43. The Barclays U.S. Aggregate Bond Index showed a marginal relationship to the equity market risk factor (likely the result of the investment-grade corporate bond component) of 3.52 but a much stronger 6.18 relationship to the 10-year Treasury bond.

Sources: Vanguard calculations, using data from Barclays and Kenneth R. French Data Library. High-yield bonds represented by Barclays U.S. High Yield Corporate Bond Index. Constant-maturity bonds represented by the following bellwether bonds: 3-month, 6-month, 2-year, 5-year, 10-year, and 30-year. Returns for Treasury bellwether bonds provided by Barclays. Equity risk factors represented by the three-factor Fama-French model: equity market, size (large minus small), and style (growth minus value). Data are for the period July 31, 1983, through December 31, 2011.

constant-maturity U.S. Treasury bellwether bonds) and to the primary equity market risk factors as defined by Eugene Fama and Kenneth French—equity market, size, and style (1983). As expected, the returns of investment-grade bonds have historically been highly correlated to yield curve

⁵ Sixty-five percent of the bonds are callable/nonrefundable, meaning the issuer cannot use the proceeds from a refinance to repay the called issues (repayment must be made from a cash account or general account); 0.2% (four bonds) are callable/refundable, meaning the issuer can repay the called bond with the proceeds from a refinance; 23% are European callable bonds, meaning the issuer has a one-time option to call the bond; and 5% are make-whole bonds, meaning the issuer can prepay the remaining debt according to a net present value calculation.

Figure 8. High-yield bonds have experienced periods of both bond-like and equity-like returns



Notes: U.S. stocks represented by the MSCI USA Index, U.S. investment-grade bonds by the Barclays U.S. Aggregate Bond Index, and U.S. high-yield bonds by the Barclays U.S. Corporate High Yield Bond Index. Data are for the period July 1, 1983–June 30, 2012.

Sources: Vanguard calculations, using data from Barclays and Thomson Reuters Datastream.

dynamics. In contrast, high-yield bonds have been more closely correlated to the risk factors commonly associated with the equity market and less so to yield curve dynamics.

Because of this dual relationship, high-yield bonds have experienced periods when they were more similar to traditional investment-grade bonds (the mid- to late-1990s), as well as times when they were more similar to equities (the early 1990s and the 2000s), as shown in **Figure 8**. Even during markets with rising interest rates, when one might expect the duration and bond-like nature of high-yield bonds to show through, they have realized inconsistent results, again with periods when returns were more like fixed income and others when they were more like equities.

Implications for investors

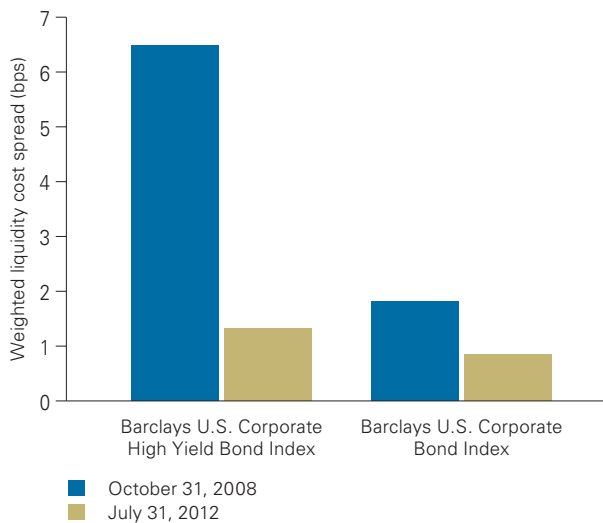
Because of their relationship to the equity market and because they are not represented in the investment-grade universe, high-yield bonds would appear useful in diversifying the portfolios of investors with significant allocations to either investment-grade fixed income or equities. However, despite this appealing theory, history suggests that the case for adding long-term strategic exposure to high-yield bonds is not a sure thing.⁶

For one thing, investors should account for the illiquidity and lack of access associated with much of the high-yield market.⁷ This can be estimated using the liquidity cost score that Barclays provides for every bond in a specific index. It measures the cost, in basis points, of immediately executing a roundtrip transaction for a standard institutional trade, such as

6 As they should for any taxable bond, investors interested in high-yield bonds should consider their income tax rate and whether they will hold the bonds in tax-deferred or taxable accounts. These considerations can prove significant in determining the relative success of a given allocation.

7 For a deeper discussion of the implications of illiquidity, see Lee (2012).

Figure 9. Illiquidity can be costly in the high-yield market



Sources: Vanguard calculations, using data from Barclays.

would be made in a typical fund or ETF. **Figure 9** compares the weighted average liquidity cost score for the high-yield index with that of the Barclays U.S. Corporate Bond Index. Two periods are shown: October 31, 2008 (the height of the liquidity crunch in the bond markets), and July 31, 2012 (a more normal period). Clearly, the cost of illiquidity can be significant for high-yield portfolios, particularly during periods of stress.

The alternative is to hold bonds in the more liquid segments of the market. However, according to Barclays, the segment identified as “very liquid”⁸ contained only 211 issues, with a market value of \$226 billion as of June 30, 2012, compared to 1,915 issues and a market cap of \$1 trillion for the broader U.S. High Yield Corporate Bond Index. Outside of those 211 issues, trading can be

infrequent, meaning pricing and valuations are difficult to ascertain. This is a significant drawback to capturing the benefits of high-yield bonds. Indeed, generating a simple, efficient frontier analysis using either the Barclays U.S. Very Liquid High Yield Corporate Bond Index or the Barclays Ba/B High Yield Corporate Bond Index (a higher-quality index that excludes the lower-rated and theoretically less liquid issues) shows that the decision to add high-yield bonds is a wash. As shown in **Figure 10**, on page 10, they neither benefit nor harm an investor regardless of the initial portfolio. All else being equal, one would then consider the cost of the portfolio as well as the cost of implementation (active versus passive) when making this decision.

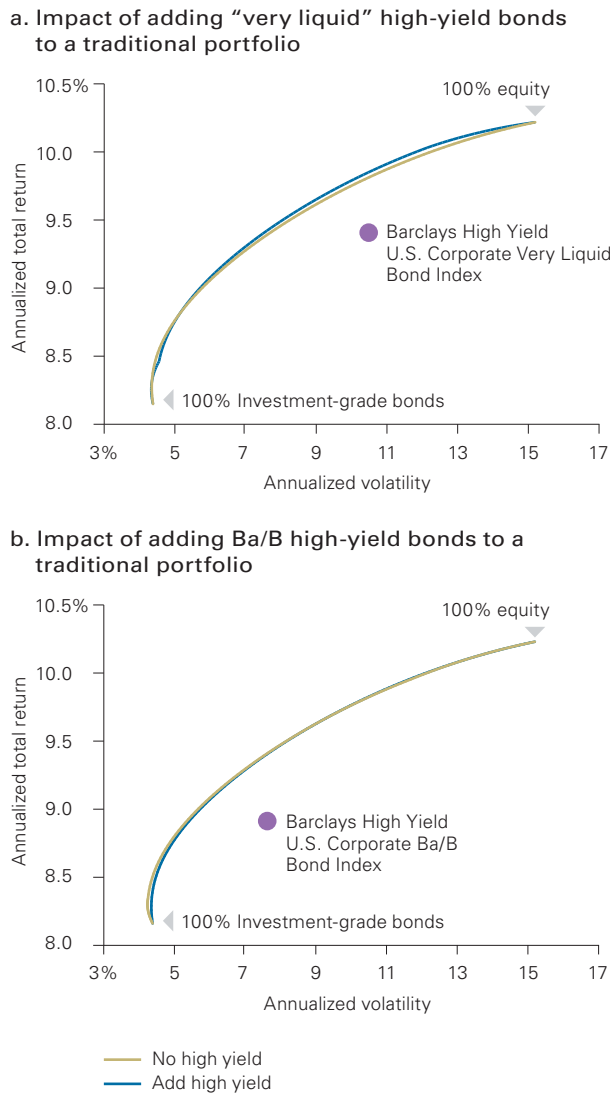
A final consideration for investors interested in high-yield bonds is whether the investment vehicle they select provides the exposure and experience they expect. Many investors will construct a portfolio based on output from some form of portfolio optimizer (such as the efficient frontier analysis shown in Figure 10). Often, the return history used in the optimizer is that of the broadest high-yield benchmark and not something that is investable.

Figure 11, on page 10, shows all funds, active (blue) and index or ETF (red) that have had at least 60 months of continuous returns at any time since 1987, and how they fared relative to the three versions of the Barclays U.S. Corporate High Yield Bond Index over their return history. Of note is that in no instance did a majority of actively managed funds outperform. In fact, the benchmark that gave active managers the best opportunity for relative outperformance was the Ba/B Index, yet even then only 21% of managers outperformed, and only 6% did so with less volatility.⁹ While one potential reason for this would be the challenges of investing in high-yield bonds, another is likely the costs of the

⁸ To be included in Barclays U.S. Very Liquid High Yield Corporate Bond Index, each bond must have been issued within the past three years, have a \$600 million minimum amount outstanding, and be its issuer’s largest bond.

⁹ It is interesting that a number of funds underperformed their target benchmark but with less volatility. When returns are risk-adjusted, 75% of funds outperformed the Barclays U.S. Corporate High Yield Bond Index, 44% beat the Barclays Ba/B Bond Index, and 90% surpassed the Barclays U.S. Very Liquid Corporate Bond Index. Of course, this could very well indicate that managers are holding high-yield issues that fall outside of the liquid segment and therefore receive appraisal-based and /or smoothed pricing over time. This could account for the lower relative volatility of the funds; however, it would not explain their underperformance, if one assumes that investing in illiquid securities should on average engender a “liquidity premium.”

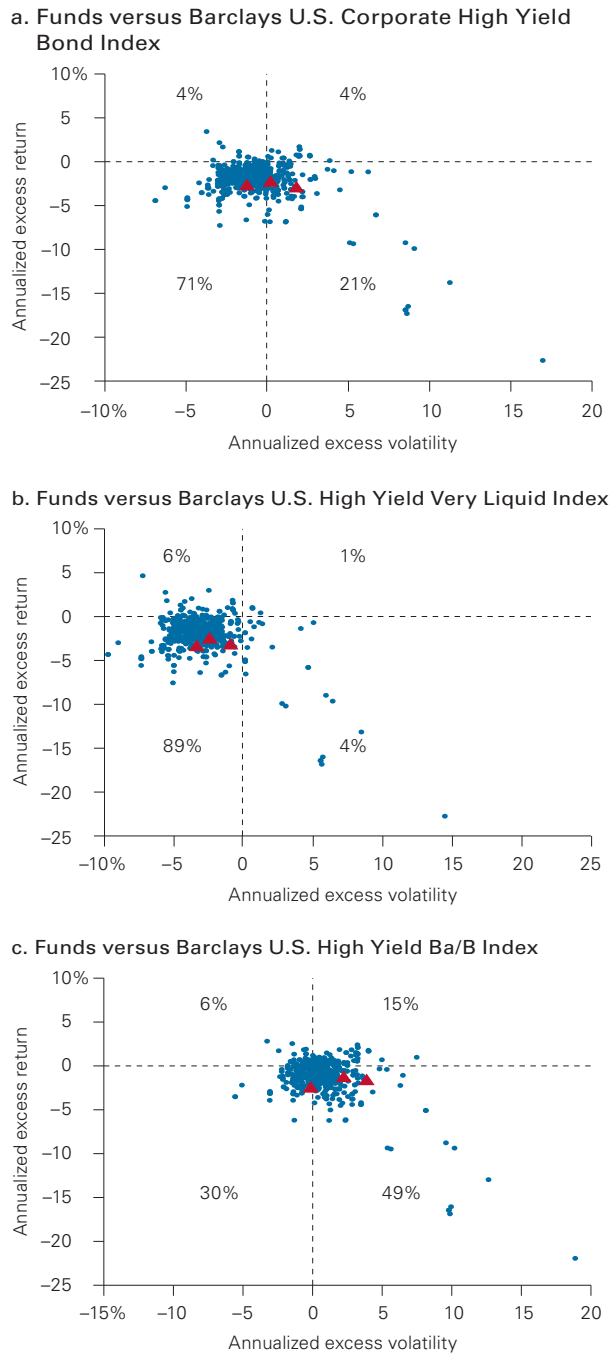
Figure 10. Adding “investable” high-yield bonds has marginal impact on portfolio risk and return



Notes: For the equity allocation, we assumed a constant 30% allocation to diversified foreign stocks. Portfolio allocations shift in 1% increments from 100% fixed income to 100% equity. High-yield bonds are added in 1% increments, taking 50% from the investment-grade fixed income allocation and 50% from the equity allocation. The allocation to high-yield bonds is capped at 20% of the portfolio. We used the following indexes for the analysis: for U.S. stocks, MSCI USA Index; for foreign stocks, MSCI World ex U.S. Index from July 1983 through December 1987 and MSCI All Country World ex U.S. Index thereafter; for investment-grade U.S. bonds, Barclays U.S. Aggregate Bond Index; for high-yield U.S. bonds in Figure 10a, Barclays U.S. High Yield Corporate Bond Index from July 1983 through December 1993 and Barclays U.S. Very Liquid High Yield Corporate Bond Index thereafter; and for Figure 10b, Barclays U.S. High Yield Corporate Bond Index from July 1983 through December 1992 and Barclays U.S. Ba/B High Yield Corporate Bond Index thereafter. Data as of June 30, 2012.

Sources: Vanguard calculations, using data from Barclays and Thomson Reuters Datastream.

Figure 11. How have investors in high-yield funds performed?



Notes: Data include all funds and share classes of funds in Morningstar’s high-yield corporate category, ETFs, and funds that have been liquidated or merged over time. All funds with at least 60 months of continuous data were compared to the identified benchmark over the period the fund has been or was alive. Excess returns were computed monthly and annualized.

Sources: Vanguard calculations, using data from Morningstar, Barclays, and Thomson Reuters Datastream.

portfolios over time. For example according to Morningstar, as of December 2011, the asset-weighted expense ratio for high-yield funds was 118 basis points. This represents a significant hurdle simply to break even with an index benchmark, which incurs no costs. Also of interest is that none of the ETFs matched any of the benchmarks in terms of both returns and volatility. This underscores the challenges faced by investors attempting to garner the theoretical benefits of high-yield bonds in their portfolios.

Conclusion

Because high-yield bonds are excluded from investment-grade indexes such as the Barclays U.S. Aggregate Bond Index, it is reasonable to evaluate their impact on a traditional portfolio. A market-weighted (approximately 5% of fixed income) allocation to these bonds would not significantly enhance or harm a diversified portfolio. That said, an allocation of this size would prove to be a very small slice of the portfolio, particularly for balanced investors. For those interested in larger allocations, the data and history suggest that on average, the downside risks have tended to outweigh the diversification benefits. This is because high-yield bonds historically have delivered characteristics of both equity and fixed income, each of which are already represented in most portfolios. Finally, investors may find it difficult to effectively capture the performance of the asset class because of liquidity constraints, which, we have shown, have led to widespread underperformance versus the broadest high-yield index.

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