Ten Questions About High-Yield Bonds

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Few asset classes in the history of the world's capital markets have generated as much publicity and controversy as junk bonds. This is surprising because the junk (or more politely, high-yield) bond market is not a particularly large piece of the U.S. corporate bond market. This article provides some answers to some of the questions frequently asked by investors.

1. What is a high-yield bond?

   Since the first bond ratings were published by John Moody in 1909, there have been bonds rated below investment grade. In fact, Taggart [1991] estimates that 42 percent of all outstanding U.S. corporate debt was rated "junk" in 1940, thanks to the ravages of the Great Depression.

   A high-yield bond is one that is not currently in default, but is rated below investment grade by one of the major bond rating agencies (that is, in the opinion of the rating agency, there is a tangible probability that the contractual terms of the bond may not be fulfilled). Using Moody's ratings, high-yield bonds are those rated below Baa3; using Standard &Poor's ratings, they are those bonds rated below BBB-. Many bonds are unrated. Those that are unrated, but trade at yields consistent with rated junk bonds, are also included in the high-yield universe.
2. How large is the high-yield bond market?

   The high-yield bond market represented 13 percent of the U.S. corporate bond market ($248 billion out of a total market of $1.91 trillion) at year-end 1996.[1]
3. Why do high-yield bonds have higher yields than investment-grade bonds?

   Figure 1 plots the yields on high-yield bonds and intermediate-term Treasuries.[2] The average spread over the last 11 years is 5.15 percent. The largest spread was 11.17 percent in December 1990. The smallest spread was observed in February 1997 at 3.06 percent. Investors demand higher yields from high-yield bonds for three reasons.

   (a) Investors require a default premium. Investors require a reward for bearing the potential risk that the company may default on its debt, referred to as a default premium. The default premium has two components. First, investors require a boost in yield that is enough to offset the expected loss in return due to default. Default is a greater concern for high-yield bond holders than for other creditors because high-yield bonds are typically the most junior of fixed-income securities within a corporation's capital structure (that is, in the event of bankruptcy, junk bond holders are last in line to get paid). Second, most investors require additional yield as compensation for being exposed to the uncertainty of not knowing whether a bond will default.

   (b) Investors require a liquidity premium. The high-yield market, because of its small size, is relatively less liquid. Investors may not be able to easily sell when they desire, and require compensation for assuming this additional risk.

   (c) Investors require a call premium. Junk bonds tend to have aggressive "call" features that allow the issuing company to call (prepay) the bond if interest rates drop or if the company's credit quality increases, thus escaping those onerous yields. These call features truncate some of the upside for bond holders. As seen in Table 1, as credit quality declines, the percentage of bonds that are callable increases. Issuers are not shy about calling these bonds. Asquith, Mullins and Wolff [1989] found that by year-end 1988, one-third of all the junk bonds issued during the years 1977-1982 had been called.
4. If high-yield bonds are so risky, why have high-yield bond indexes exhibited less volatility than Treasury bond indexes?

   Depending on the series used, high-yield bonds can appear to have had less volatility than Treasuries. For example, from 1986 to 1997, the annualized monthly standard deviation of CS First Boston's High-Yield Index

was 7.3 percent compared with 10.7 percent for the Ibbotson Associates Long-Term Government Bond Index. The lower observed volatility is caused by two factors.

(a) Shorter duration. High-yield bonds tend to have shorter maturities, higher coupons, and greater probability of early call, all of which shorten their duration. A shorter duration, in turn, implies less volatility as interest rates fluctuate. A government bond index that has a more similar maturity is the Ibbotson Associates Intermediate-Term Government Bond Index. This series had a 5.0 percent annualized standard deviation over the same period.

(b) Stale prices. The lack of liquidity in the high-yield market can cause "stale" or out-of-date prices. Stale prices dampen the observed volatility, thus making junk bonds seem less volatile than they actually are. We can reduce the influence of this effect by looking at lower frequency return data. For example, when using annual returns (instead of monthly) to compute the standard deviation for high-yield bonds, we get 12.8 percent compared with 6.5 percent for the Ibbotson Intermediate-Term Government Bond Index.

5. Why did high-yield bonds do so poorly in the late 1980s and early 1990s?

From August 1989 through October 1990, high-yield bonds dropped 13 percent in value. Mutual funds specializing in junk bonds did even worse, falling 16 percent. Were these horrible results just a symptom of a broader bond market debacle? No, the Lehman Brothers Government/Corporate Index was up nine percent over the same period. Five factors have received at least partial blame for this debacle.

(a) Slowing economy. The last recession lasted from August 1990 to February 1991, and in the months before the official onset of the recession, the economy was slowing. Such an environment is not conducive to junk bond issuers who need to generate the kinds of profits necessary to service their debt.

(b) Poorly structured deals. In the latter part of the 1980s, the number of high-yield issues brought to market grew substantially, but the average credit quality of these issuers was lower than in previous years.

(c) Federal regulation. The federal government required savings and loans to sell off their high-yield bond portfolios. The combination of low liquidity and the fact that savings and loans represented 15 percent of the market put downward pressure on prices.[3]

(d) Skittish mutual fund investors. As returns plummeted, mutual funds (representing 25 percent of the high-yield market) saw shareholders bailing out in huge numbers as the net new cash flow to high-yield bond funds was -$7.8 billion.[4]

(e) Drexel's collapse. Drexel Burnham Lambert, the principal market maker and underwriter, disappeared in a puff of litigation. This event contributed to a crisis of liquidity in the high-yield market. Despite predictions of its demise in 1990, the market recovered. From November 1990 to December 1992, the high-yield market had a cumulative total return of 72 percent compared with 26 percent for Lehman Brothers' Intermediate-Term Government/Corporate Index.[5]

6. Are shareholders in high-yield mutual funds sensitive to poor performance?

Shareholders are a fickle lot, and their large withdrawals from high-yield funds should not have been a surprise. From January 1984 to February 1997, the correlation between monthly total returns and net new cash flow for these mutual funds was 0.46.6 If we just focus on the period before the high-yield crash (January 1984 to July 1989), the correlation is also 0.46. In other words, the sensitivity of shareholders in junk bond mutual funds has not changed in any material way (that is, if returns begin to disappoint, watch out for a flood of redemptions).

Using regression analysis, we can make more specific predictions. The function below provides an estimate (in millions of dollars) as to the net cash flow of high-yield mutual funds given the return to high-yield bonds in a given month.

Net new cash flowi = 157 + 15334ri

For example, if high-yield bonds drop 5 percent in a given month, the model predicts that the net new cash flow for high-yield bonds will be -$609 million.[7]

7. How can the long-term expected return on high-yield bonds as an asset class be estimated?

   To estimate the expected return, the following three-step procedure can be employed.

   (a) Determine risk-free asset and its current yield-to-maturity. The identity of the risk-free asset varies depending on a given investor's investment horizon (for instance, the safest investment in nominal terms for an investor with a ten-year horizon is a ten-year zero coupon Treasury bond).

   (b) Identify the sources of risk in high-yield bonds. As discussed in question number three, high-yield bonds have three sources of extra risk: higher default rates, a relatively illiquid market and aggressive call features.

   (c) Estimate the compensation investors can expect to receive for bearing these risks. Sufficient historical data do not exist to estimate the size of the three-risk premia separately, but we can estimate all three combined. First, construct a government bond portfolio with the same average duration as the junk bond proxy using intermediate-term and long-term government bond benchmarks with known durations. The estimated size of the combined three-risk premia is equal to the difference of the arithmetic average annual total return of the duration-matched government bond portfolio and the arithmetic annual total return of the junk bond proxy over the period of 1970 to the present. Using this approach, the estimate for the risk premium of junk bonds is 2.05 percent. The expected return is this premium plus the risk-free rate.

   The 2.05 percent figure may seem small because the yield spread as of June 1998 of junk bonds over Treasuries is 4.15 percent and the average yield spread over the last 11 years is 5.15 percent. However, because of defaults, distressed exchanges, and early calls, investors in junk bonds do not capture the full amount of the spread. As Table 2 shows, taking into account defaults at an assumed default rate that is quite low (1.5 percent) lops nearly 100 basis points off the return.

8. How can the expected standard deviation of high-yield bonds be estimated?

   Our estimate of the standard deviation of returns for junk bonds is the historical standard deviation of annual returns since 1970. Using data through 1997, this approach results in an estimated standard deviation of 12.4 percent.

   Annual returns are used because, as mentioned above, the lower liquidity of the junk bond market can lead to stale prices, which makes it appear that high-yield bonds are less volatile than they actually are when their historical returns are examined. This lack of fresh prices becomes less of an issue when lower frequency data is examined. As a result, if historical volatilities are computed using annual data, a better reflection of what the "true" volatility has been will shine through.

   Pre-1970 data are of limited relevance as a forecasting tool for bond-oriented asset classes because of fundamental changes (such as the termination of interest rate targeting by the Federal Reserve and the presence of persistent inflation since the early 1970s) in the behavior of fixed-income markets. Nevertheless, the question is of little practical significance because the standard deviation of junk bond annual returns from 1926-1997 is 12.9 percent, nearly identical to that of the 1970-1997 period.

   As seen in Figure 2, the fluctuations of monthly returns on junk bonds have been lower in recent years. Overweighting more recent history or just using the last few years is a mistake because if investors are concerned with establishing a long-term asset allocation, they are best served by using historical data that reflects a broad range of market conditions, both good and bad. It seems reasonable to us that poor returns like those experienced in 1973-1974 or 1990 could reappear, so we want to include those in our forecast. Similarly, while the last few years have been quite good for the junk bond market, an over-reliance on those

years as the basis for a future forecast could cause a repeat the mistakes that investors made in the mid-1980s.[8]

9. What is the estimated expected correlation between high-yield bonds and other asset classes?

   The correlation of junk bonds with other asset classes is also calculated using annual returns since 1970. If an asset class doesn't have data back to 1970, one should use the longest period available.

   As seen in Table 3, this procedure produces correlations between high-yield bonds and the S&P 500 that are higher than the correlation between investment-grade bonds and the S&P 500 over the same period.

   Surprising? Not really. Think about what happens when a company with poor credit quality reports higher-than-expected earnings-its stock probably jumps in price on the news, as do its bonds. Why? If the company is reporting good earnings, it implies that the company's ability to service the debt has improved and a lower risk premium (that is, yield spread) over investment-grade bonds is appropriate. That lower yield spread will lead to a higher price.

   Analysts should always be on the lookout for situations in which historical data doesn't appear to provide useful forecasts. Determining the cause of changes in the behavior of assets is important because if the cause can be found and that cause is likely to become a permanent part of the financial landscape, we should discontinue using older data when making forecasts.

   Table 4 represents results from a study in which we examined how economic expansions and recessions impact the correlation between high-yield bonds and stocks, as well as the correlation between investment-grade and high-yield bonds.

   In the 13 recessions dating back to November 1926, the average correlation between stocks and high-yield bonds is 0.57, and the correlation between high-yield and government bonds is 0.31. In the 13 expansions, the average correlation between stocks and junk bonds is 0.41, and 0.38 for junk and investment-grade bonds.[9] In other words, junk bonds have behaved more like equity during recessions and more like bonds in expansions. The fact that the U.S. economy has been in an expansion for the last several years explains why the correlation between high-yield bonds and stocks has declined. However, the recent slowing of the economy and the sharp losses in both the high-yield and stock markets are consistent with the behavior of these markets in a recession.

10. Are high-yield bonds an attractive asset class?

    When we use the above methods for estimating the mean-variance optimization inputs, we do not see large allocations to high-yield bonds when a sufficiently broad range of other asset classes are available for investment. This result is driven by the relatively high correlations of these bonds with the equity classes. As a result, high-yield bonds provide minimal additional diversification, and our expected return spread over investment-grade bonds is insufficiently high to compensate for the lack of diversification.[10]

Are these conclusions final? Not at all. High-yield bonds are still a relatively new asset class, and the state-of-the-art mechanisms for assessing their role in an asset allocation policy are still evolving. As analysts acquire more data and more analysis is performed, our understanding of this market will grow and we will more properly be able to determine its role.

We also recommend that portfolio construction include sensitivity analysis, which determines how sensitive particular asset allocations are to changes in these forecasts. The goal of sensitivity analysis is to identify portfolios that are efficient, or nearly efficient (that is, they maximize or come close to maximizing expected returns for a given level of risk) under a variety of possible scenarios. The way to perform sensitivity analysis is to analyze the behavior of various portfolios under several extreme but realistic circumstances, such as high and low inflation, high and low economic growth, and strong and weak domestic currency rates. We consider asset allocations that are optimal under the most likely scenario but stray far from the efficient frontier under various alternative scenarios to be inferior to allocations that are more robust (that is, close to the efficient frontier in more of the alternative scenarios).

Endnotes

1. The size of the corporate bond market is from Salomon Brothers [1997]. The size of the junk bond market is from Amato [1997].
2. Throughout this article, a high-yield index that is actually a spliced series of three other indexes is used. From 1986 to present, it is the CS First Boston High Yield IndexTM. This index is designed to mirror the investable universe of the high-yield public debt market, including cash paying issues, zeros, pay-in-kind issues, defaulted issues, private issues, fallen angels, and new issues. All bonds in the index are U.S. dollar denominated and rated Split BBB and below. Yield is equal to the market weighted yield-to-worst, the minimum of the yield to every call date in the call schedule for a security. For 1984-1986, the index is the 110-Bond Drexel, Burnham Lambert High Yield Composite Index. Before 1984, the index is from Roger G. Ibbotson and Michael J. Gibbs, "The Corporate Bond Market: Structure and Returns," Yale University, third draft, 1986. Bonds included in this series are rated Ba and below by Moody's, including all unrated issues. The intermediate-term Treasury bond series is based on a one-bond portfolio. The bond chosen each year is the shortest non-callable bond with a maturity of not less than five years, and it is "held" for the calendar year. The monthly yields reported from 1987-June 1998 are calculated from *The Wall Street Journal*. For 1986, the yields were obtained from the Center for Research in Security Prices' Government Bond File.
3. According to Amato [1997], the percentage of the high-yield market owned by S&Ls went from 15 percent in 1988 to 8 percent in 1990, to 2 percent in 1992 and none in 1995.
4. As S&Ls have exited the high-yield market, mutual funds have taken on an even larger role. Amato [1997] reports that as of year-end 1995, mutual funds accounted for 40 percent of the market.
5. As this article is being edited, it appears that factors (a) and (d) are present again. Also, while no major market maker has collapsed, liquidity is clearly an issue just as it was in the early 1990s when Drexel's problems became severe.
6. Net new cash flows to high-yield mutual funds are from the Investment Company Institute. January 1984 was the first month of available data.
7. While monthly returns are a statistically significant variable when projecting the monthly net cash flows for high-yield mutual funds, the above regression had an R-squared of 21 percent. This indicates that only about one-fifth of the variations in cash flows were explained by the monthly returns.
8. As this article is being edited, those poor returns have returned with a vengeance.
9. We start in November 1926, because the months January through October of that year represent the tail-end of an expansion period. To be consistent with the other expansions and recessions covered, we chose to use only complete expansions and recessions.
10. This result should not be too surprising. High-yield bonds do not comprise a large part of the investable wealth of the United States. To argue that this asset class deserves a large allocation is tantamount to arguing that the asset class is severely underpriced by investors. In the early years of the asset class, many did indeed make this argument, but more recent studies that take into account a broader range of economic conditions do not support the notion that high-yield bonds as an asset class are persistently mispriced.

References

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