

DTSSM (Duration Times Spread)

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The authors study the behavior of spread changes and recommend a new approach, Duration Times Spread (DTS), to measuring risk in credit portfolios, which measures the sensitivity to a relative change in spread. After analyzing the spread behavior of corporate bonds, the authors examine whether DTS or spread duration is better for measuring the excess return volatility of credit securities. The authors conclude that the DTS methodology accurately represents the impact of spread changes on excess return.

In allocating assets in a credit portfolio, many fixed-income asset managers use contribution to spread duration, which measures the sensitivity to a parallel (absolute) shift in spreads, as the basis for their asset allocation. However, in a credit portfolio, some securities will have higher spreads relative to others within the same portfolio. In this article, the authors introduce a new approach to measuring the risk of credit securities called Duration Times Spread (DTS). This measure is calculated as a product of the market weight, spread duration, and spread. The authors suggest that DTS, which measures the sensitivity to a relative change in spread, is more appropriate than the spread duration approach.

The authors begin by analyzing the spread behavior of corporate bonds in order to demonstrate whether DTS is preferable to spread duration in measuring spread exposure. The authors argue that if the historical volatility of an issuer is to be used to forecast future volatility, it should be fairly stable. They use the 36-month trailing volatility of spread changes for various credit ratings in the Lehman Brothers Credit Index between September 1989 and January 2005 to

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analyze the spread behavior. The authors observe that the spread volatility changed significantly during the period, with volatility declining prior to 1998 and increasing thereafter. They, however, observe more stable spread volatilities over the same period when the investment-grade corporate bonds are partitioned by spread levels rather than credit ratings.

The authors also compare the volatility of absolute and relative spread changes of all bonds in the Lehman Brothers Credit Index rated Baa for the period from September 1980 to January 2005, excluding the period covering the Russian Crisis and the Long-Term Capital Management debacle (from August 1998 to November 1998). They note that the relative spread approach offers more stability relative to the absolute spread approach. They also investigate and analyze the absolute and relative spread change volatility for the period prior to and after 1998, and they observe that absolute spread volatility increased in the post-1998 era. However, the relative spread volatilities were more stable over the period examined. The authors suggest that absolute spread volatility is highly unstable and tends to rise with increasing spread, unlike relative spread volatility, which offers more stability.

The authors examine the dynamics of spread change of individual bonds to determine whether spreads shift in parallel or proportionally when spreads widen or tighten across a sector. The authors argue that if spreads change in a relative manner, then the volatility of systematic spread change across a given sector should be proportional to the average spread of that sector. The authors use the monthly spread data from the Lehman Brothers Credit Index and Lehman Brothers High Yield Index historical databases for the period from September 1989 through January 2005. In analyzing the spread changes for large issuers in the communications sector against the beginning-of-month spreads in January 2001, the authors note that spreads in the sector in January 2001 changed in a proportional fashion. They also carry out a similar analysis using all individual bond data from all the sectors and 185 months included in the sample and observe that bonds that trade at a wider spread widen more during a widening and tighten more during a rally. The authors subsequently examine the relationship between the systematic spread volatility and the level of spreads. Using both investment-grade and high-yield data, the authors demonstrate that a

linear relationship exists between systematic spread volatility and spread level. The authors also observe a similar linear relationship between idiosyncratic spread volatility and spread level. They note that the relative spread changes characterize both investment-grade and high-yield credits.

After analyzing the spread behavior of corporate bonds, the authors examine whether DTS or spread duration is appropriate for measuring the excess return volatility of credit securities. The authors demonstrate that excess return volatility increases linearly with DTS, and they observe that portfolios with very different spreads and spread durations but with the same DTS exhibit the same excess return volatility. The authors also demonstrate that relative to spread duration, DTS provides a better forecast of the excess return volatility of a portfolio. They examine the relationship between DTS and excess return volatility across seniority classes and conclude that the linear relationship is still preserved irrespective of the seniority class of the bond.

Finally, the authors note several implications for portfolio managers. The authors note that the best measure of exposure to a systematic change in spread is DTS rather than spread duration. Furthermore, the linear relationship between DTS and the volatility of nonsystematic return could enable portfolio managers to define an issuer limit policy that enforces a smaller allocation to risky credits. The authors recommend that portfolio risk management models be modified to view sector exposures in terms of DTS contributions and sector spread changes in relative terms. The authors conclude that DTS methodology accurately represents the impact of spread changes on excess return.

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