SHOCK ABSORBER EFFECT IN CREDIT SPREADS

R E S E A R C H

- We have observed that changes in corporate spreads and Treasury yields are negatively correlated because of their opposing reactions to changes in the economic environment.
- This negative correlation causes corporate spreads and Treasury yields to move largely in opposition over time, creating what we call the "shock absorber" effect through which corporate bonds are able to provide a more stable yield and return than do Treasuries alone. This effect is stronger in high yield bonds since they are more heavily affected by changes in the credit environment.
- The shock absorber effect in high yield bonds is particularly helpful in a rising rate environment and has significant implications for portfolio construction over longer market cycles.

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THE SHOCK ABSORBER EFFECT—AN INTRODUCTION

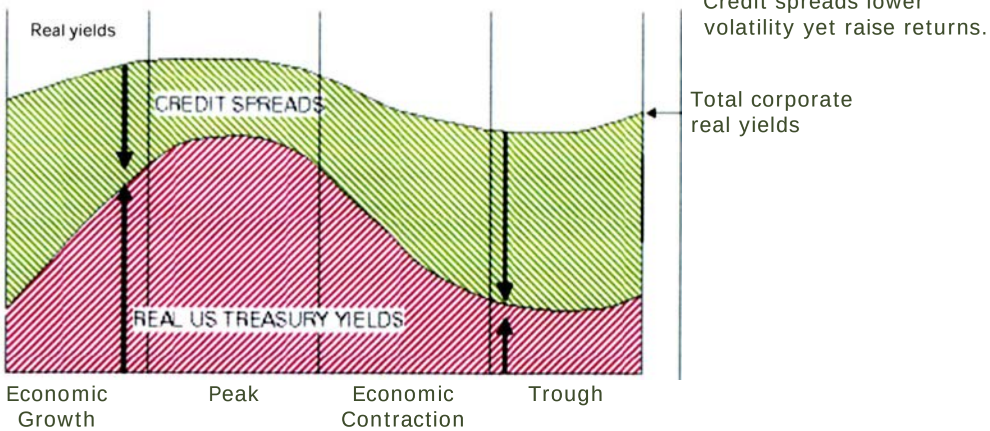
July of 2003 saw tremendous upheavals in the fixed income markets. After sinking to multi-decade lows, Treasury yields soared by nearly 100 basis points (bps) in one of the largest one-month jumps since World War II. While this volatility in the Treasury market dominated investment headlines that month, another part of the bond market fared far better. High yield debt performed relatively strongly in July, and on an equal duration basis outperformed Treasuries by roughly 200 bps.

Far from being a one-time occurrence, this performance disparity illustrates a powerful attribute of corporate bonds in relation to Treasuries. Corporate bond yields can largely be decomposed into two components: the underlying yield of a similar duration Treasury bond, and the additional yield (or corporate spread) required by investors as compensation for assuming non-Treasury credit risk. Treasury yields tend to be a fairly pure barometer of the market's expectations for interest rates since they carry no credit risk. Corporate spreads, on the other hand, are driven by expectations for the health of the business sector.

What makes corporate bonds particularly interesting is that these two components tend not only to move independently, but also in opposition to each other. In an expanding economy, the growing demand for money leads to higher overall treasury yields. At the same time, the expansion lowers corporate default risk resulting in a lower corporate spread. In recessionary times, the opposite is the case—Treasury yields tend to fall, but corporate spreads increase as the incidence of corporate defaults increases. These countervailing movements cause corporate spreads to act as a "shock absorber" by cushioning corporate bonds against changes in Treasury yields at different stages in the economic cycle. Figure 1 illustrates this effect.

Figure 1

Credit Spreads as a Natural Shock Absorber



*Source: MacKay Shields**

This article is presented as a demonstration of the analytical process of MacKay Shields' High Yield Active Core Group. The article was prepared in January 2004 and the observations and conclusions were accurate at that time, no representation is being made that the conclusions are still accurate and no attempts have been made to test or verify those conclusions.

This paper explores the shock absorber effect from both theoretical and empirical perspectives, and draws conclusions for institutional investors seeking solutions for a changing investment environment.

QUANTITATIVE FRAMEWORK

In order to understand the effect of corporate spreads in offsetting changes in Treasury yields, we must first examine the drivers of those changes. We do this by decomposing them into two primary factors that have historically explained more than 85% of the fluctuations in the Treasury curve. The first of these, or “level,” measures change in yields assuming a consistent shift across the full maturity distribution. The second, or “slope,” takes maturity into account by measuring the change in the slope of the yield curve, or the difference between yields at the short and long ends of the curve.

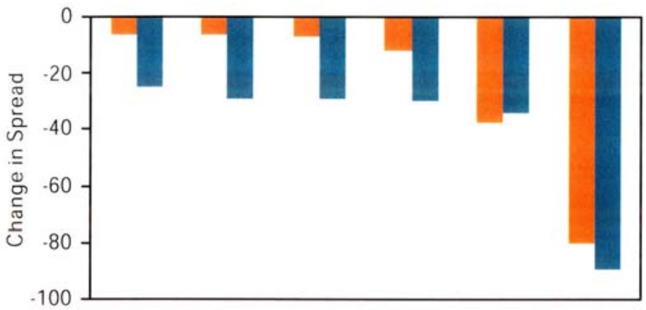
We empirically derived the effects of changes in level and slope by using historical US Treasury and corporate yield curve data between September 1998 and April 2003. Over this period, we calculated the covariance between yields of Treasuries and corporate bond spreads of various ratings, measuring both across the full maturity spectrum. These covariance calculations estimate the extent to which corporate spreads can be expected to move given a move in Treasury yields.

In Figure 2, we use the results of our empirical work to plot the expected changes in the level of corporate spreads given a 100-bps change in first the level and then the slope of the Treasury curve. We chose this figure as a reasonable representation of the near-term path of interest rates in the US given consensus expectations for the economy and the bond market. Equally important, it represents what many would consider a bearish environment for bonds.

The first line in the table (represented by the orange bars) plots the average change in corporate spreads across the curve for any rating category, assuming the US Treasury yield increases by 100 bps in a level fashion across the Treasury curve. The second line of the table (the blue bars) shows the change in the slope of the corporate spread curve given a 100-bps steepening in the slope of the treasury curve.

Figure 2

Expected Change in Spread Given a 100-bps Change in Treasury Yields



	AAA	AA	A	BBB	BB	B
Level	-6	-6	-7	-12	-38	-80
Slope	-25	-29	-29	-30	-34	-89

Rating

*Source: MacKay Shields, September 1998 to April 2003**

The outcome of this exercise leads to two related conclusions. First, the offsetting contraction in corporate spreads given a 100-bps rise in Treasury yields is significantly greater for high yield than for investment grade in both the cases of level and slope. This indicates that the shock absorber effect is much more powerful for high yield than for investment grade. This stands to reason, given that the greater default risk of high yield bonds results in a larger corporate spread available to offset changes in Treasury yields. Second, the offsetting changes in slope are also markedly larger for high yield than investment grade bonds. For example the -89-bps move in B bonds almost completely offsets the assumed 100 bps increase in slope, leaving a net movement in slope of 11 bps. By contrast, the smaller credit spread of AAA bonds results in a smaller offset of -25 bps and a larger net movement of 75 bps. Given the maturity component of slope, this disparity indicates that high yield bonds are less sensitive to maturity (and thus interest rates) than are investment grade bonds. This conclusion makes intuitive sense as return of principal is the driving force behind high yield bonds regardless of their maturity, while maturity is more important for bonds with a better credit profile.

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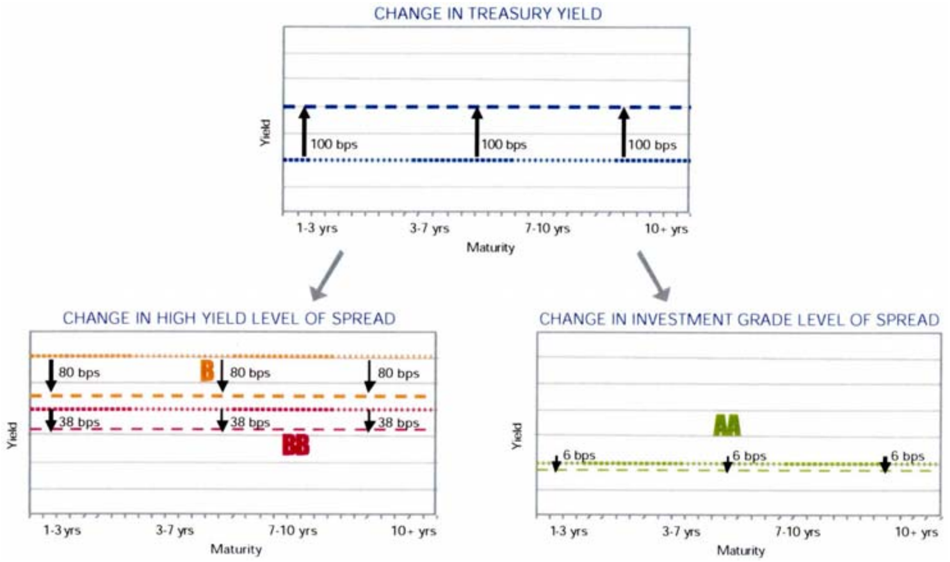
CHANGES IN LEVEL AND SLOPE

We can now examine the impacts of level and slope changes in greater depth in order to gauge the effectiveness of corporate spreads as shock absorbers for investment grade and high yield bonds. From historical data and the calculations shown in Figure 2, we know that if US Treasury yields shift up in level by 100 bps across the entire curve, BB spreads are expected to contract by 38 bps and B spreads by 80 bps, while AA investment grade spread levels only contract by 6 bps. This larger impact on the level of high yield spreads is exactly what we would expect. If Treasury yields have shifted up by 100 bps, the economy is most likely in a rapid growth phase. High yield companies are highly leveraged and are therefore most likely to benefit the most from this economic growth. In fact, B companies benefit almost twice as much as BB companies. Figure 3 shows this graphically.

Figure 3

Differential Transmission of the Shock Absorber Effect on Level: An Economic Expansion

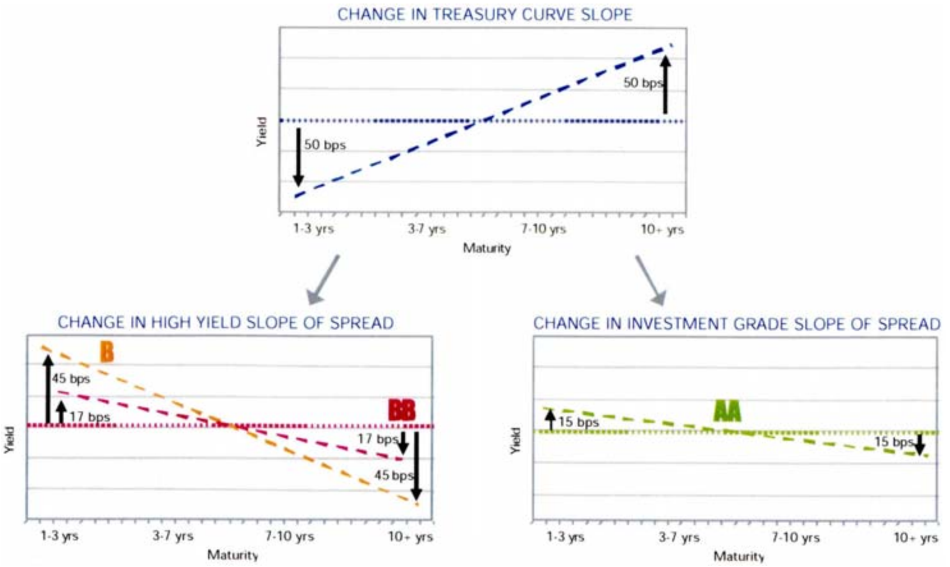


*Source: MacKay Shields**

In Figure 4, we see that the results are similar in terms of slope. The change in the slope of the investment grade spread curve will offset less of the steepening in the slope of the US Treasury curve than will the change in the slope of the high yield spread curve. The shock absorber is 17 bps and 45 bps for BB spreads and B spreads respectively, and 15 bps at each end of the curve for investment grade spreads. Again, this is what we would expect from the statistics shown in Figure 2—slope acts as a significant shock absorber for high yield bonds, but much less so for investment grade bonds.

Figure 4

Differential Transmission of the Shock Absorber Effect on Slope: An Economic Expansion



*Source: MacKay Shields**

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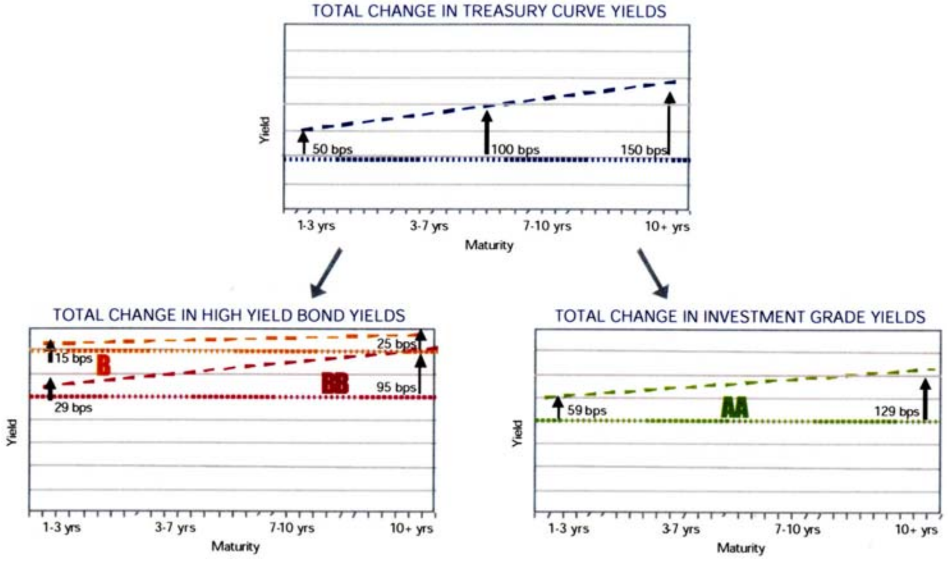
Figure 4 also reaffirms another key difference between the effect of slope on investment grade and high yield spreads. As mentioned above, changes in slope take into account maturity. Based on the outcome in Figure 4, this means that AA bonds, which at 15 bps have a far lower shock absorber than the 45 bps of B bonds, are clearly more sensitive to maturity considerations.

LEVEL AND SLOPE COMBINED

Our analysis up to now has focused on the disaggregated effects of level and slope as the key drivers of changes in the Treasury curve. In the real world, however, the curve usually reflects a combination of the both factors. The top plot in Figure 5 combines the level and slope impacts together to produce the total change in the Treasury yields. We find the curve shifts up by 50 bps at the short end and 150 bps at the long end in response to the economic expansion.

Figure 5

Differential Transmission of the Shock Absorber Effect on Total Yield: An Economic Expansion



*Source: MacKay Shields**

The total corporate yield curve change is a bit more complicated. It is the combination of the slope and level changes of both the Treasury and the spread curves for a total of four factors. The bottom two figures show the total yield curve movements for corporate bonds taking into account both the upward movement in Treasury yields and the offsetting compression in corporate spreads. The total shock absorber effect on BBs and Bs is quite evident. Yields on BB-rated bonds are only expected to move by about two-thirds as much as Treasuries, while yields on Bs should hardly move at all. The expected shock absorber effect on AAs is almost non-existent, and paradoxically the effect on the very short end of the curve would in fact be to slightly exacerbate the rate increase!

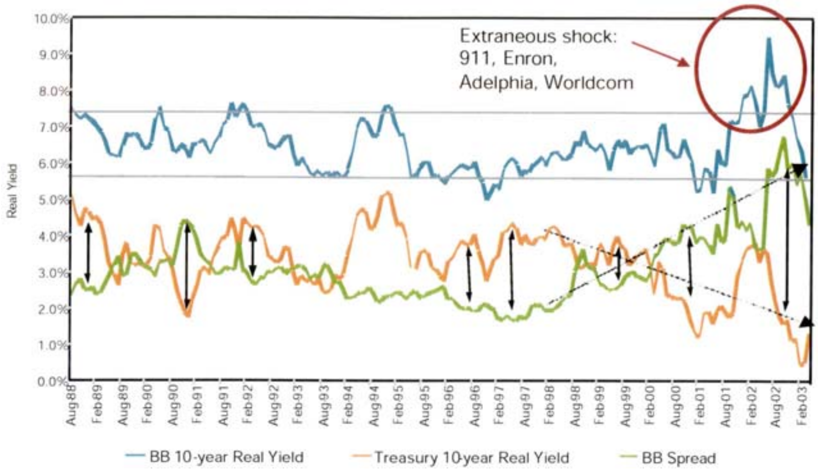
This analysis gives us a clearer view of the dynamics of the shock absorber effect within a quantitative framework. Having established this framework, our next step is to explore the impact of the shock absorber effect in recent market history to determine its prevalence in real market conditions.

THE SHOCK ABSORBER EFFECT IN ACTION

Figure 6 compares BB and Treasury yields from August 1988 to April 2003. As the graph shows, the shock absorber effect has largely kept BB yields within a well-defined range. In fact, 87% of the total BB real yield observations fall within a 200-bps band. This is a powerful result and has significant implications for investors who demand steady or "immunized" real yields over time. Only in the most recent market downturn did the spread clearly break out of that band. This was a result of a loss in confidence caused by the defaults of Enron, Adelphia and WorldCom, set against the backdrop of the destruction of the World Trade Center—clearly an outlier event as subsequent default rates never justified such high spreads. Indeed, yields subsequently returned to more historically normal levels.

Figure 6

Consistent Real Yield: High Yield's Natural Shock Absorber



87% of observations fall between 5.5% and 7.5% real yield.

*Source: MacKay Shields**

We next examine the effect of the shock absorber in specific market environments. We broke the 1988 to 2003 period into 13 smaller continuous periods in which significant yield changes occurred.[1] In Table 1 the yields at the start and end of each period are shown, together with the changes.

Table 1

Time Period		10-year Treasury			10-year BB rated bonds		
Start	End	Start	End	Change	Start	End	Change
Aug-88	Jul-89	5.2	2.7	-2.5	7.6	6.2	-1.4
Jul-89	Apr-90	2.7	4.3	1.6	6.2	7.3	1.1
Apr-90	Dec-90	4.3	1.8	-2.5	7.3	6.2	-1.1
Dec-90	Oct-91	1.8	4.5	2.7	6.2	7.7	1.5
Oct-91	Sep-93	4.5	2.5	-2.0	7.7	5.8	-1.9
Sep-93	Dec-94	2.5	5.2	2.7	5.8	7.7	1.9
Dec-94	Jan-96	5.2	2.8	-2.4	7.7	5.5	-2.2
Jan-96	Aug-96	2.8	4.1	1.3	5.5	6.1	0.6
Aug-96	Nov-96	4.1	2.9	-1.2	6.1	5.1	-1.0
Nov-96	May-97	2.9	4.4	1.5	5.1	6.2	1.1
May-97	Feb-01	4.4	1.3	-3.1	6.2	5.4	-0.8
Feb-01	Mar-02	1.3	3.9	2.6	5.4	7.7	2.3
Mar-02	Mar-03	3.9	0.6	-3.3	7.7	5.7	-2.0
Average Absolute Change				**2.3**			**1.5**

*Source: MacKay Shields**

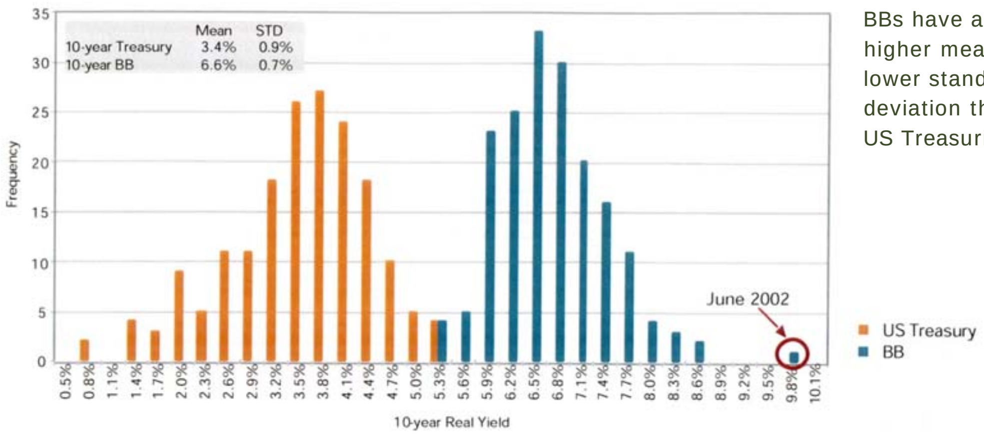
In every time period studied, the change in BB yields was less than the change in Treasury yields. This difference was often significant, as was the case between December 1990 and October 1991 when the US economy was pulling out of a recession. During this time, the ten-year treasury rate rose by 2.7%, but the yield on BBs only increased by 1.5%. This pattern also held during periods of economic slowdown, such as the one between May 1997 and February 2001, in which the Treasury yield fell 3.1% but the yield on BBs fell only 0.8%. On average, the absolute changes on Treasury yields over the sub-periods was 2.3% but only 1.5% for BBs. This implies that the shock absorber removed one-third of the Treasury yield changes. This is what we would expect from the statistical work described in Figures 2 through 5.

EFFECT ON TOTAL RETURNS

Having shown that the shock absorber effect has had a very real effect on yields, we turn to its impact on returns. Figure 7 compares the monthly real yield distributions of ten-year US Treasuries and the ten-year BB universe over the same 1988 to 2003 time period. As we would expect, BB securities have had a higher mean yield and a lower standard deviation than have ten-year US Treasuries. This includes the outlier month of June 2002, when WorldCom tumbled into the BB universe.

Figure 7

Distribution of Real Yield



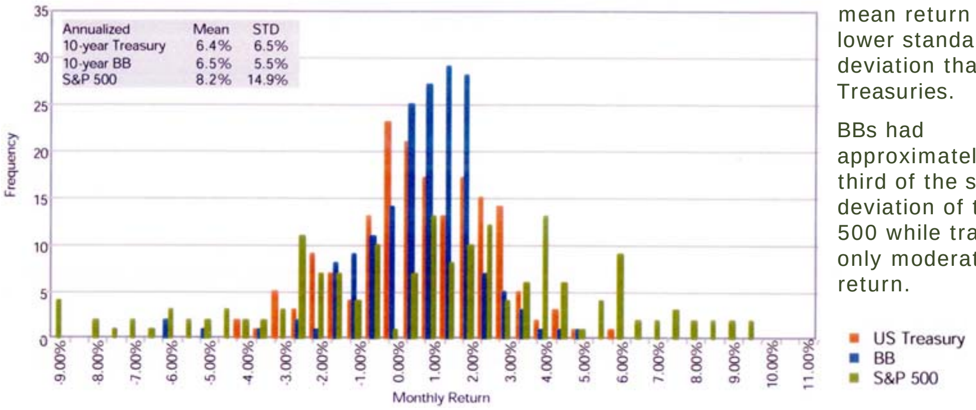
BBs have a higher mean and lower standard deviation than US Treasuries.

*Source: MacKay Shields**

One would expect from the higher and more stable yield level of BB bonds that their returns should be higher, but have a smaller standard deviation, than US Treasury bonds. Figure 8 shows that this has in fact been the case. Interestingly, the return from equities (using the S&P 500) was greater over this period, but the risk was almost three times that of BB bonds. This means that the historical risk-adjusted returns of high yield have been greater than those of both US Treasuries and equities.

Figure 8

Distributions of Monthly Real Total Returns



BBs had a higher mean return and lower standard deviation than US Treasuries.

BBs had approximately one-third of the standard deviation of the S&P 500 while trailing only moderately in return.

*Source: MacKay Shields**

LOOKING AHEAD

Our research into recent historical performance patterns makes a compelling case for the superior ability of high yield to produce strong risk-adjusted returns. Going forward, we believe the case may well be even stronger for two reasons. First, nominal Treasury rates declined from 9.2% to 3.5% during the period studied, adding 277 bps to the total return of ten-year Treasury bonds. Without this capital appreciation, BBs would have outperformed Treasuries by a full percentage point rather than 30 bps. The current level of both low real and nominal rates makes a near-term repetition of this pattern nearly impossible, and in fact points to the likelihood of the next significant shift in interest rates being upward. As we have seen, this is precisely the type of environment in which high yield outperforms even more strongly.

The second reason concerns the recent volatility in the high yield market mentioned above. Prior to September 2001, ten-year BBs had outperformed comparable duration Treasuries by an annualized 120 bps, with 200 bps less risk. The combination of a major terrorist attack and massive corporate malfeasance is also (we hope) highly unlikely to repeat itself, meaning that high yield's relative performance should be even stronger going forward.

The implications for fixed income investors are compelling. With such strong potential drivers for positive performance, high yield is a very attractive option for investors seeking return enhancement within a risk-efficient context. The asset class is even more intriguing for investors and plan sponsors seeking to smooth out the volatility of their portfolio of assets as well as their income stream. Whatever the application, we believe strongly that high yield has matured into an asset class with great appeal for institutional investors.

Endnote:

[1] The periods chosen will not change the conclusions.

* The analysis was done by members of the High Yield Active Core Group, under the supervision of Dan Roberts, while they were employed by Pareto Partners. The Group moved to MacKay Shields on October 15, 2004. Both the decision-making process and all of the investment decision makers have remained intact from Pareto Partners to MacKay Shields. However, certain other members of the Group that worked on the analysis are not employed by MacKay Shields.

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