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Credit Trends:

The Relationship Between Corporate Credit Ratings And Debt Cost Across The Maturity Curve And Through Stress Periods: 1945-Present

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Credit Trends:

The Relationship Between Corporate Credit Ratings And Debt Cost Across The Maturity Curve And Through Stress Periods: 1945-Present

Corporate credit ratings, outlooks, and CreditWatch listings serve as useful benchmarks for the cost of debt. When looking at data from 1945 to February 2011, Standard & Poor's observes a close relationship between borrowing costs and credit ratings. As ratings decrease, bond spreads or yields tend to increase. This negative correlation between ratings and yields (or spread over some base rate) is unsurprising, in our view, because ratings provide a consistent gauge of default risk.

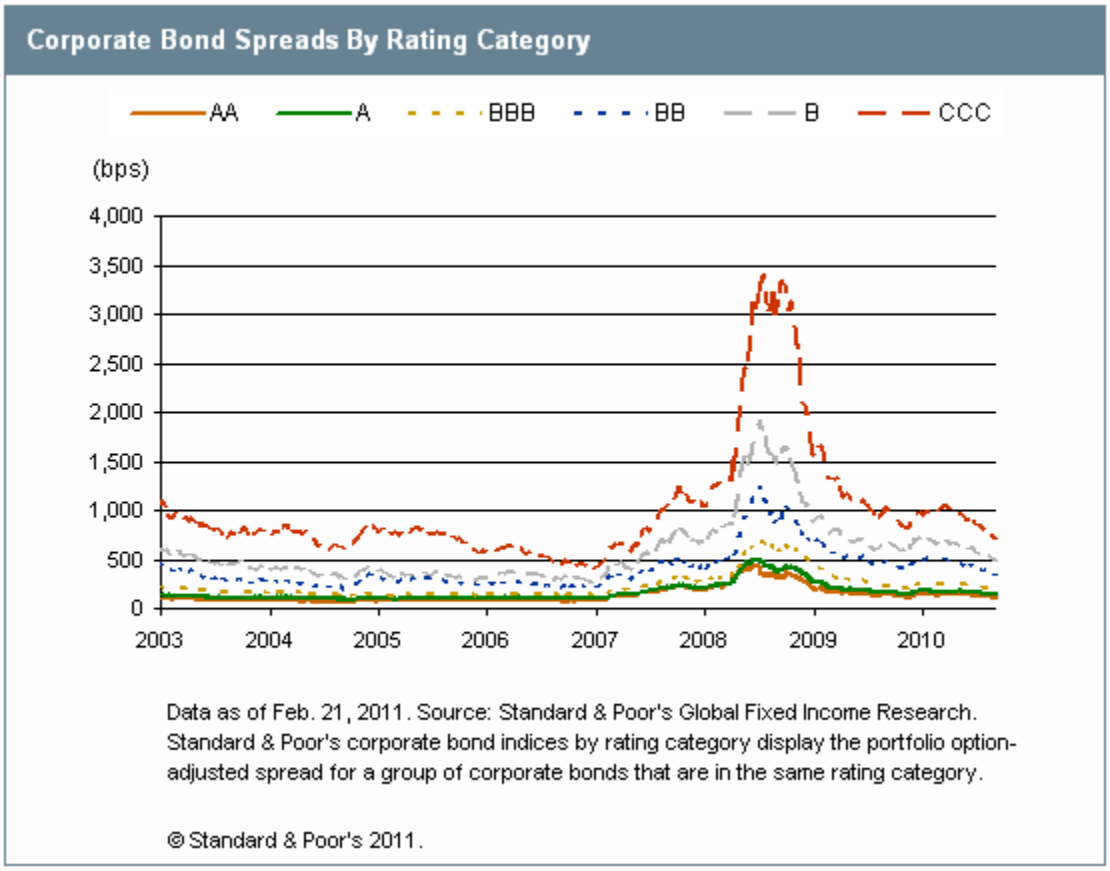
In our analysis, we found a clear relationship between corporate bond spreads or yields and ratings, both when the spreads or yields are arranged in an index, and when they're tallied as an average across a pool of bonds. This relationship holds true across various bond indices over time. We also found evidence that the relationship is similar across maturities as well as during periods of both benign and high-stress credit market conditions. Based on our bond indices from 2001 to 2011, we saw the largest increase in spreads from 'BB+' to 'BBB-'.

Although bond and credit default swap (CDS) spreads are correlated with ratings, spreads across issuers, even those rated at the same level, often vary significantly. Therefore, it is not uncommon to see an overlap in spreads for individual issuers of adjacent ratings. These effects are often temporary as ratings change or bond spreads adjust. We note that ratings are not meant to capture factors such as bond market liquidity, which affect bond pricing. The impact of these factors can vary quite drastically at different points in time.

Key observations we made in our analysis include:

- Prior studies have documented the relationship between yields and ratings in various ways. For example, Ederington, Yawitz, and Roberts (1987) and West (1973) showed that ratings are significant predictors of yield, even when controlling for other factors (see the "Related Research" section). Numerous other studies have focused on the effect of rating actions on bond, stock, and CDS prices, and they generally show significant market reactions to rating changes. The majority of past studies found some relationship between market pricing and ratings, so it's not a surprise that average yields or an index of bond yields should display a strong relationship with ratings.
- When looking at Standard & Poor's corporate bond indices by rating category between 2003 and February 2011, it's clear that the bond spreads tend to fall in rank order with ratings. For example, the risk premium on a typical 'A' rated issue is lower than the premium on an issue rated 'BBB' (see chart 1).

Chart 1



- This relationship holds true over a much longer time horizon (see charts 2 and 3). We calculated the indices as the average yields of available bonds in the sample from 1945 to 1995. In almost every quarter, the average yield on higher-rated bonds was lower than the average yield for lower-rated bonds. We studied the bond yield indices from Citigroup and noticed a similar picture (see chart 4).

Chart 2

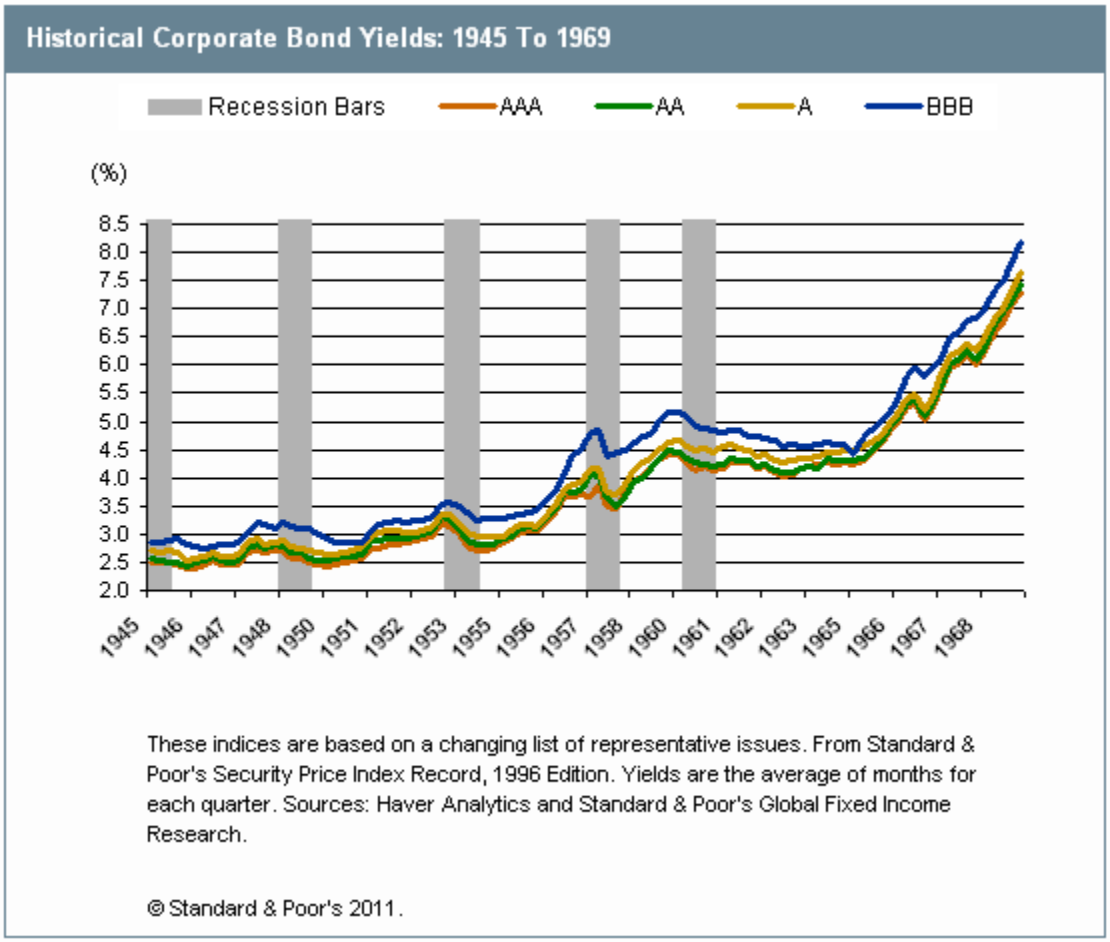

Historical Corporate Bond Yields: 1945 To 1969
Recession Bars
AAA
AA
A
BBB
(%)
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1945
1946
1947
1948
1950
1951
1952
1953
1955
1956
1957
1958
1960
1961
1962
1963
1965
1966
1967
1968
These indices are based on a changing list of representative issues. From Standard & Poor's Security Price Index Record, 1996 Edition. Yields are the average of months for each quarter. Sources: Haver Analytics and Standard & Poor's Global Fixed Income Research.
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Chart 3

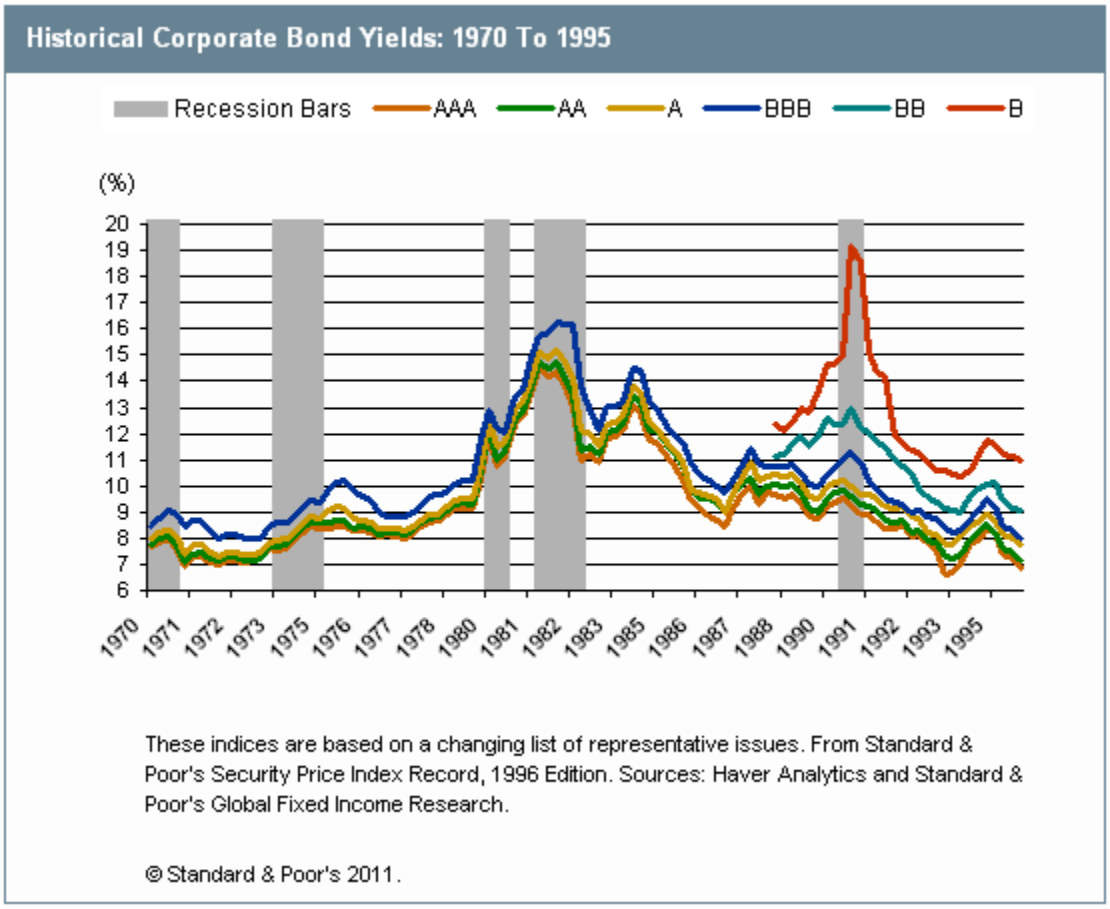
Historical Corporate Bond Yields: 1970 To 1995
Recession Bars
AAA
AA
A
BBB
BB
B
(%)
20
19
18
17
16
15
14
13
12
11
10
9
8
7
6
1970
1971
1972
1973
1975
1976
1977
1978
1980
1981
1982
1983
1985
1986
1987
1988
1990
1991
1992
1993
1995
These indices are based on a changing list of representative issues. From Standard & Poor's Security Price Index Record, 1996 Edition. Sources: Haver Analytics and Standard & Poor's Global Fixed Income Research.
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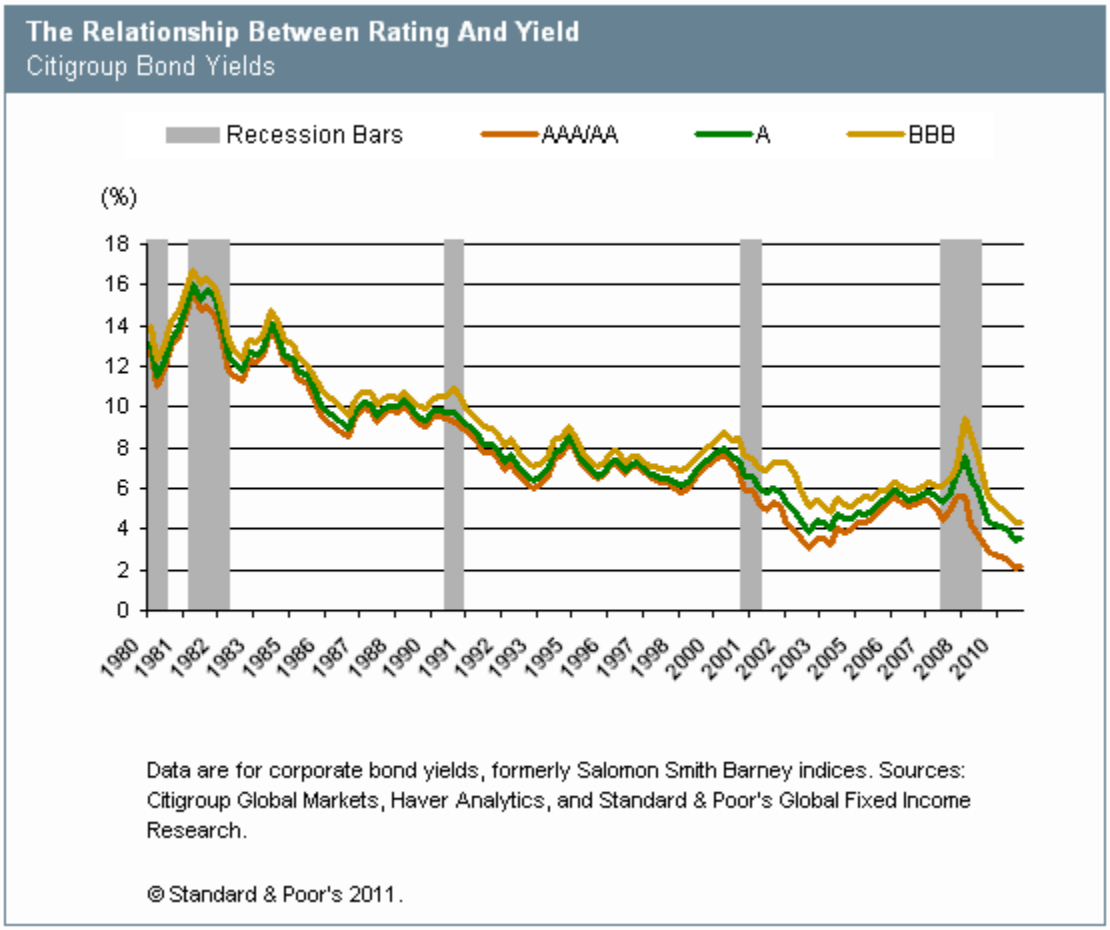
Chart 4



- The negative correlation between ratings and yields also holds true across the maturity curve (see chart 5). Lower ratings yield more at each maturity point, and the relationship is more apparent when controlling for maturity. Charts 6 through 8 display the time series of yields for the five-, 10-, and 20-year maturity points. For most of the series, the ordinal relationship between rating and yield is preserved. Periods in which ratings and the yield indices are out of line are usually transitory.

Chart 5

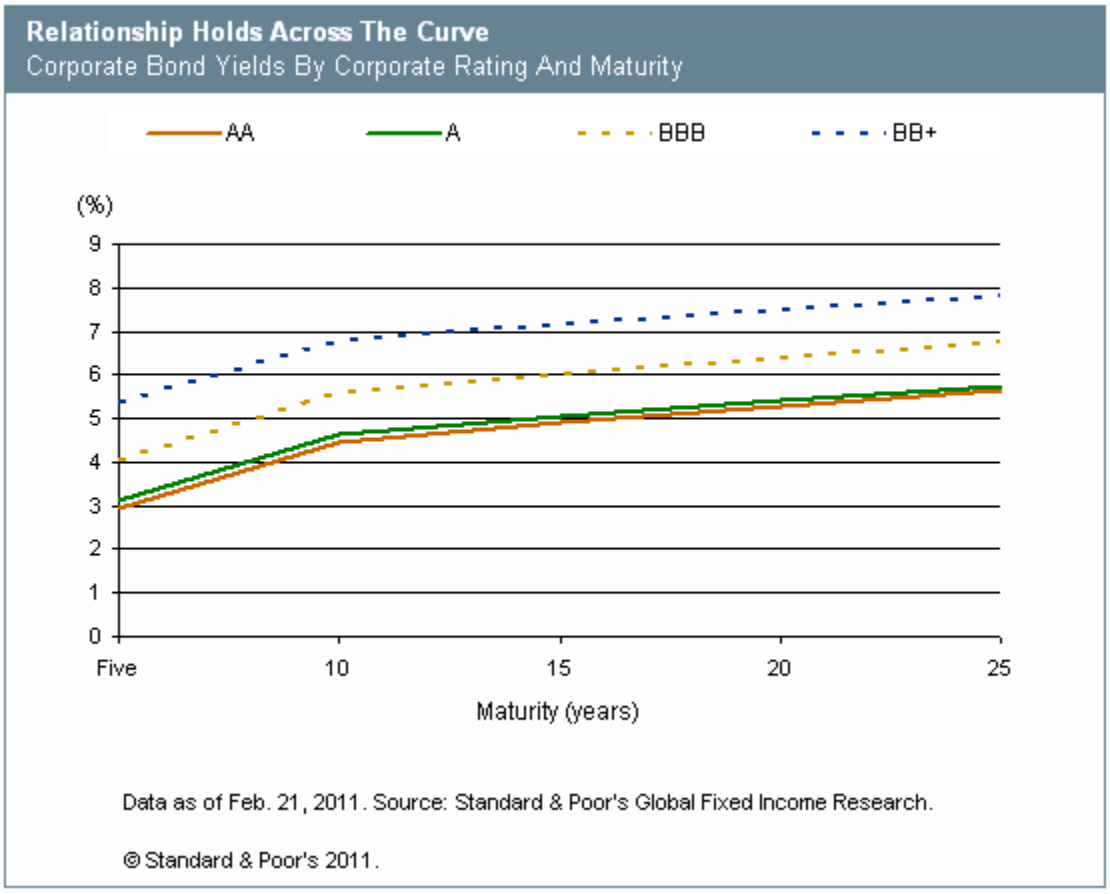

Relationship Holds Across The Curve
Corporate Bond Yields By Corporate Rating And Maturity
AA
A
BBB
BB+
(%)
9
8
7
6
5
4
3
2
1
0
Five
10
15
20
25
Maturity (years)
Data as of Feb. 21, 2011. Source: Standard & Poor's Global Fixed Income Research.
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Chart 6

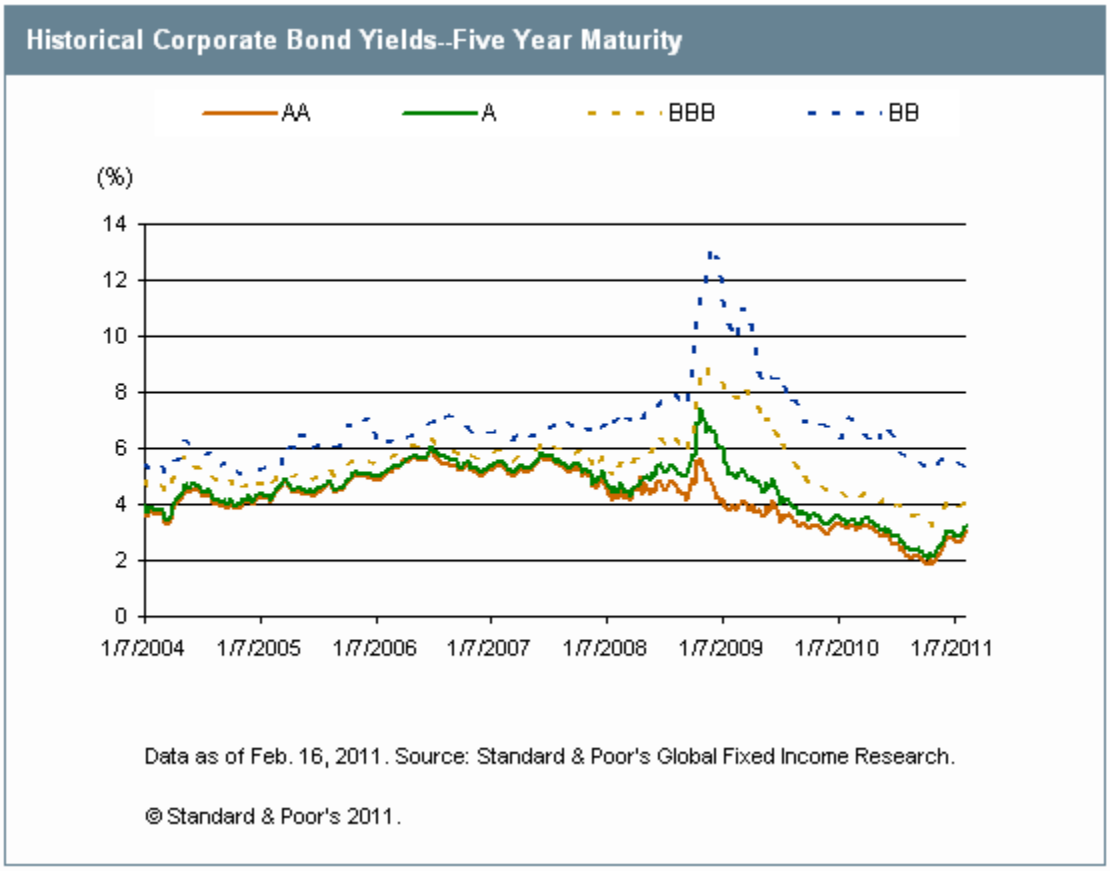
Historical Corporate Bond Yields--Five Year Maturity
AA
A
BBB
BB
(%)
14
12
10
8
6
4
2
0
1/7/2004
1/7/2005
1/7/2006
1/7/2007
1/7/2008
1/7/2009
1/7/2010
1/7/2011
Data as of Feb. 16, 2011. Source: Standard & Poor's Global Fixed Income Research.
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Chart 7

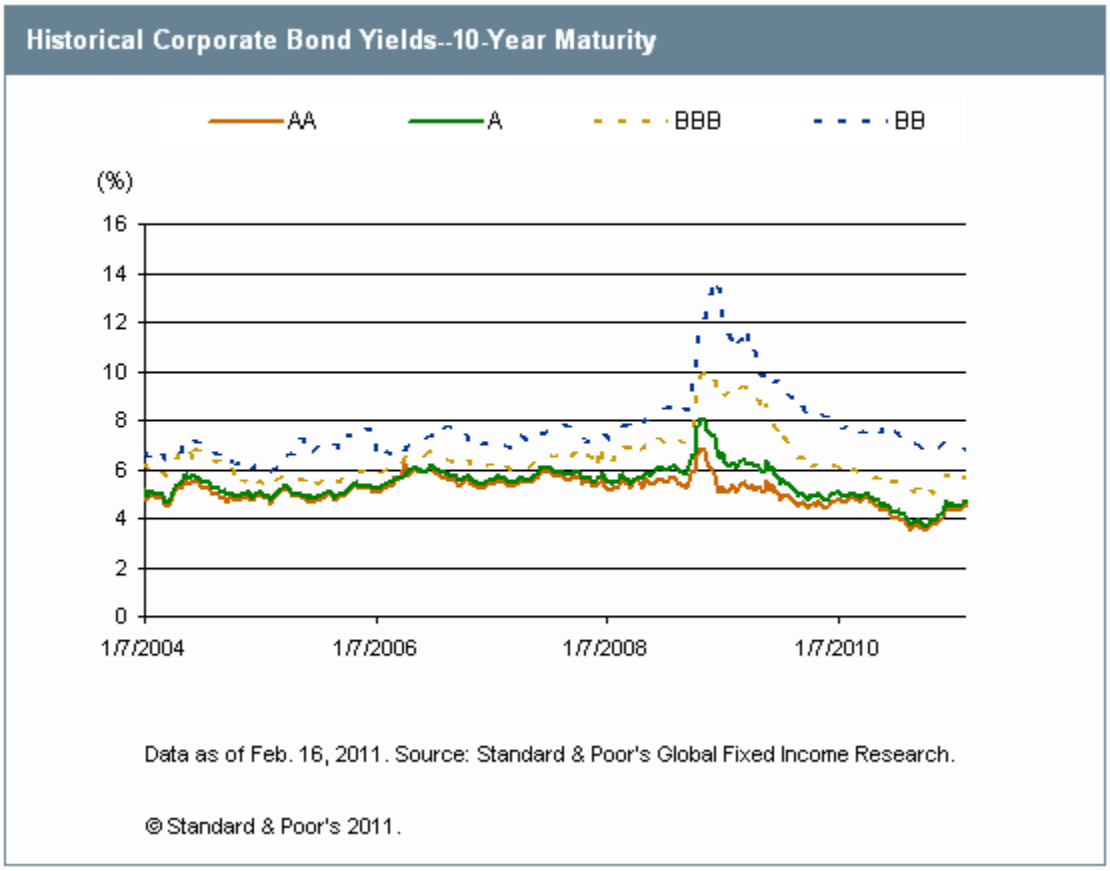
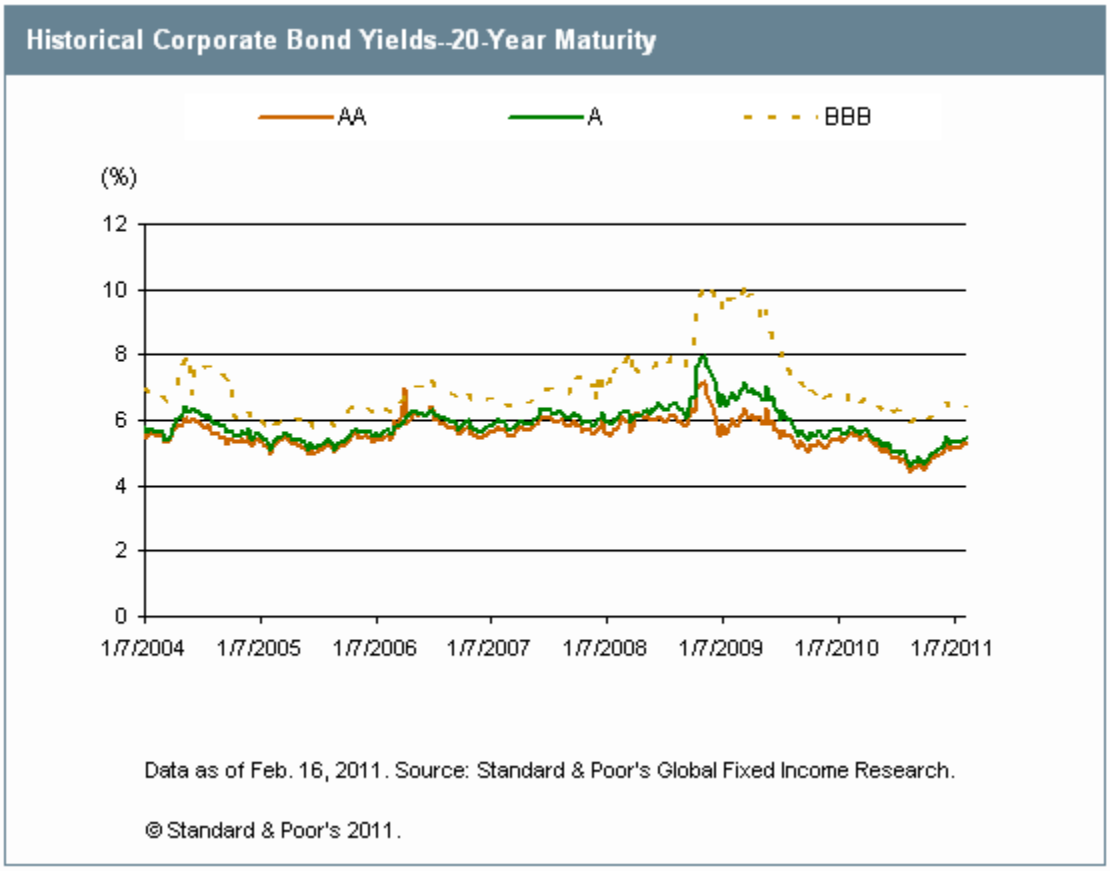
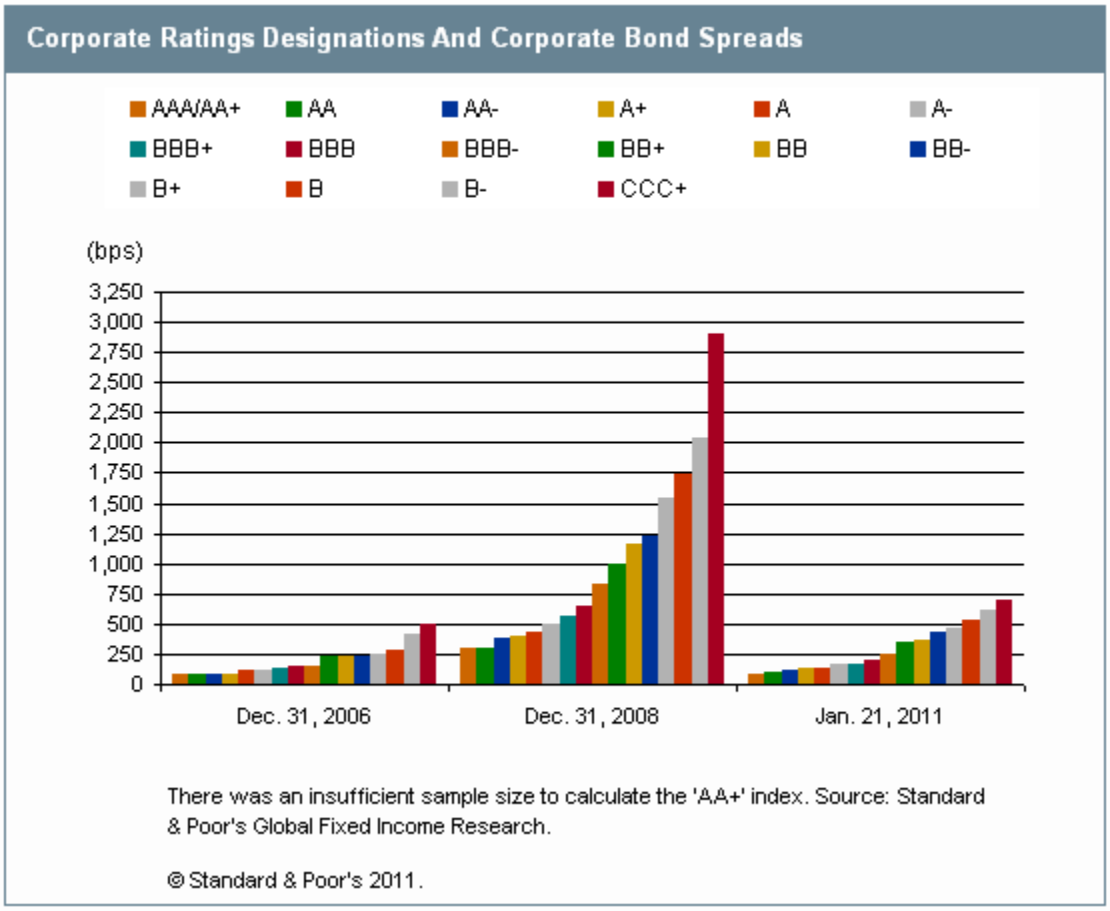

Historical Corporate Bond Yields--10-Year Maturity
AA
A
BBB
BB
(%)
16
14
12
10
8
6
4
2
0
1/7/2004
1/7/2006
1/7/2008
1/7/2010
Data as of Feb. 16, 2011. Source: Standard & Poor's Global Fixed Income Research.
© Standard & Poor's 2011.

Chart 8



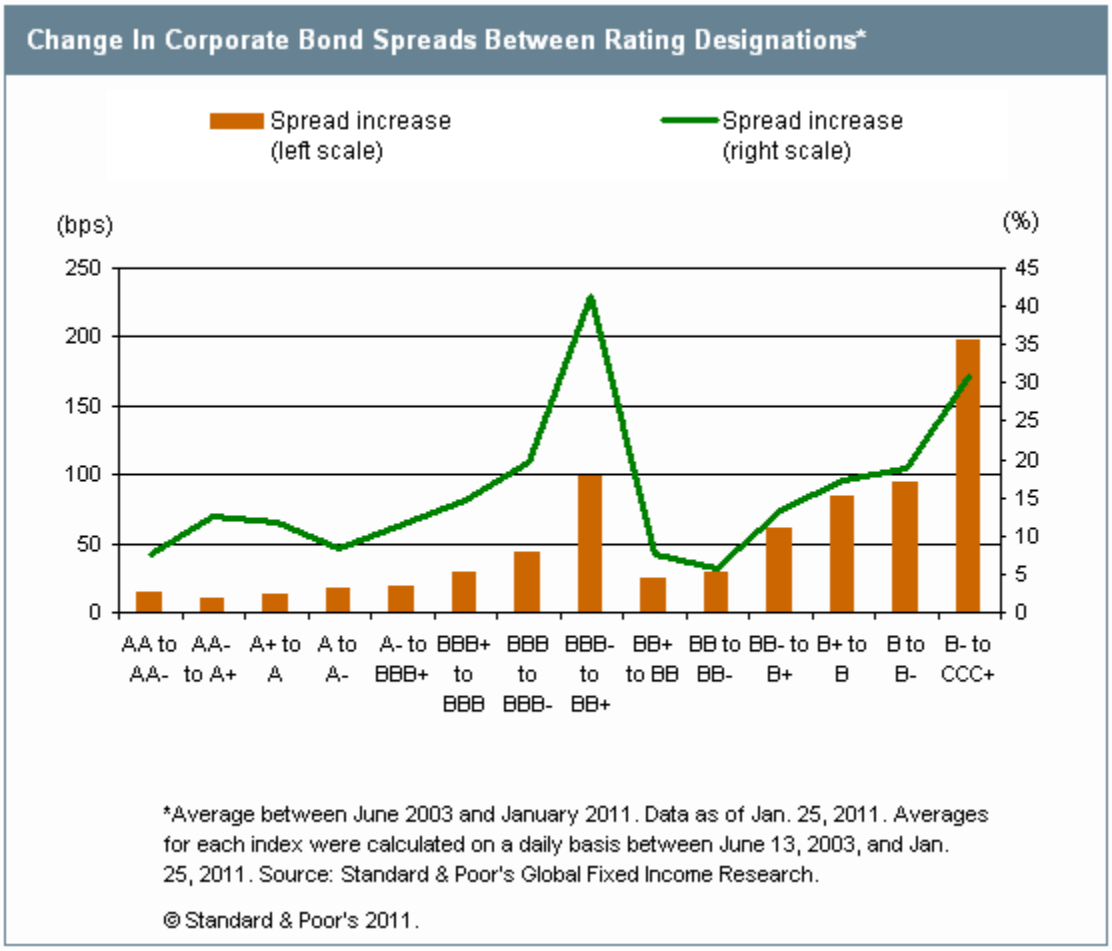
- This negative correlation between ratings and yields is clear not only when looking at ratings by category (such as 'BBB', which covers 'BBB+', 'BBB', and 'BBB-), but also when looking at specific rating levels (such as 'A-' or 'BB+'). In addition, we found this same relationship even during periods of market stress (see chart 9). Notice that even though spreads are much wider across the rating levels at the end of December 2008, the negative correlation between ratings and spreads is still exhibited.

Chart 9



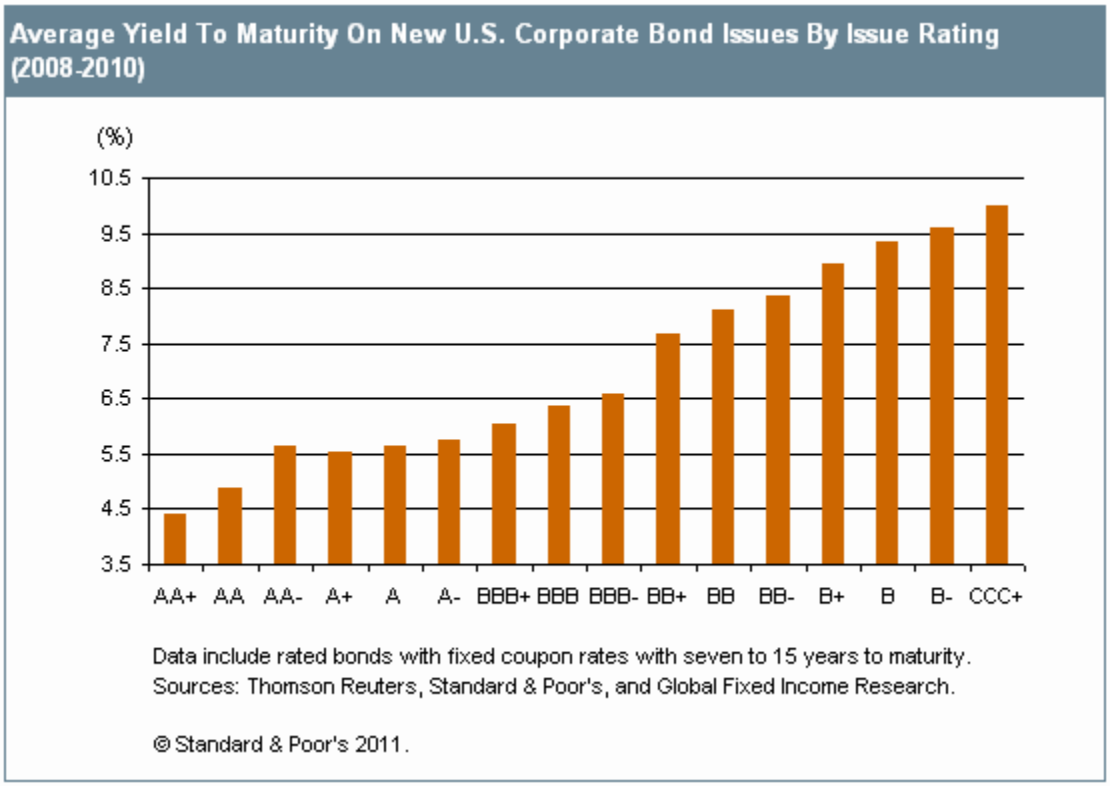
- Although bond spreads tend to increase as ratings decrease, the spread pickup as ratings decline is not consistent between each ratings designation (see charts 10). In particular, the spread increase, in both basis points and as a percentage change, is often much larger when moving to 'BB+' (speculative grade) from 'BBB-' (investment grade) than it is when moving one notch within the 'BBB' or 'BB' categories. This has implications for future borrowing costs of fallen angels (or companies that are downgraded to speculative grade from investment grade).

Chart 10



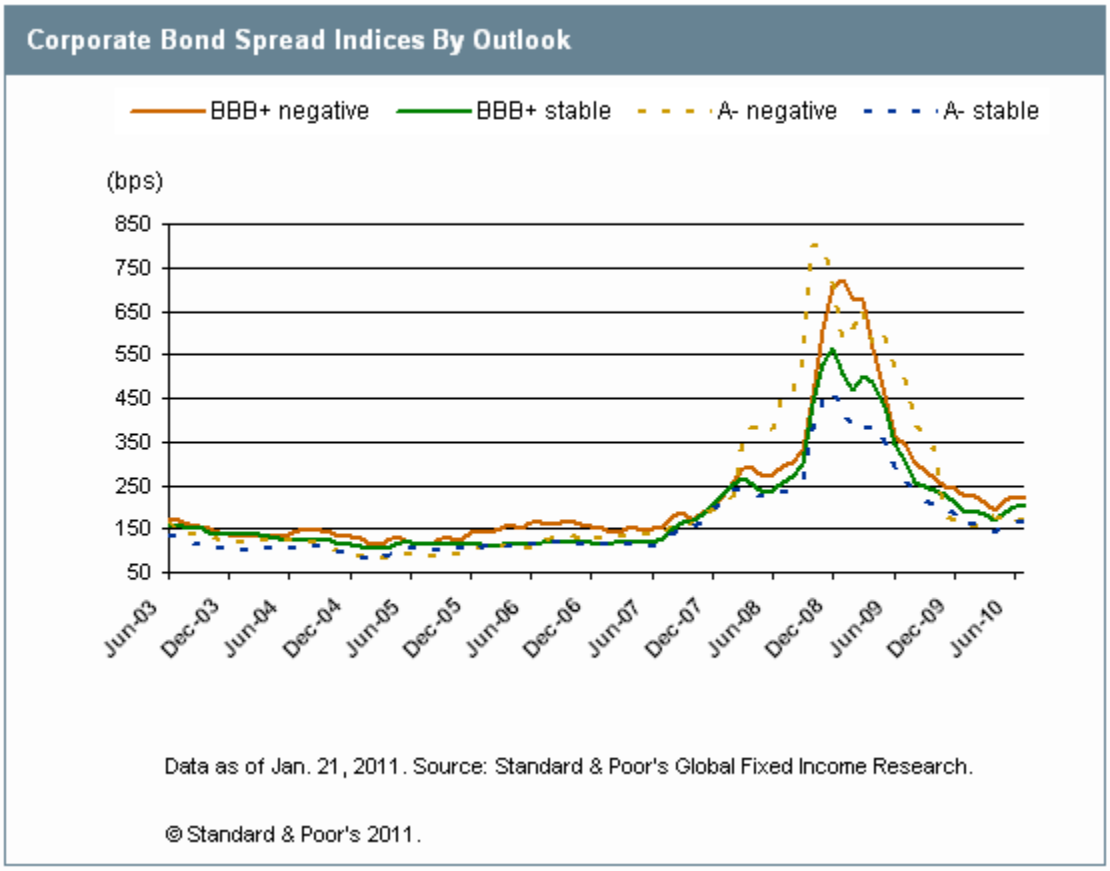
- The yield to maturity at issue for new bond issues provides a better picture of the borrowing costs that companies face. The average yield is usually higher for successively lower rating categories (see chart 11). An exception to this is the 'AA-' rating category, which had a larger proportion of issues in the earlier part of the 2008 to 2010 period, when yields were higher.

Chart 11



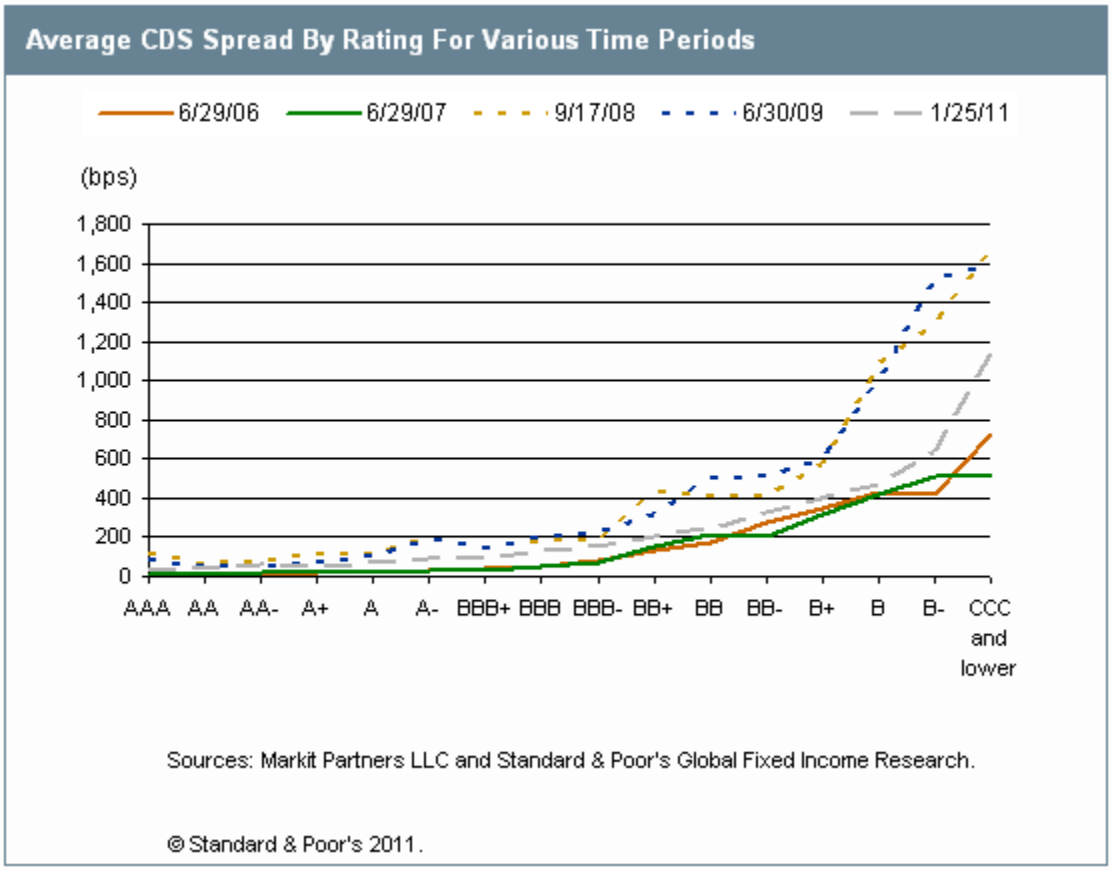
- Companies with negative outlooks or ratings on CreditWatch negative often exhibit wider spreads than companies that are rated the same but that have stable outlooks. As an example, we took a look at more than six years of data for industrial companies rated 'A-' and 'BBB+' with negative or stable outlooks. (We didn't include issuers with positive outlooks or ratings on CreditWatch because the sample sizes were too small.) On average, spreads for companies with negative outlooks tend to be wider than the spreads for similarly rated companies with stable outlooks (see chart 12).

Chart 12



- CDS spreads and ratings exhibit the same negative relationship that we saw between corporate bond yields and ratings. We averaged a sample of CDS quotes for five-year contracts by Standard & Poor's rating on different days between 2006 and 2011. For the most part, the higher ratings have lower yields. Notice that the spreads for all ratings tend to be higher during times of credit market and economic stress (see chart 13).

Chart 13



- At any point in time, the spreads for individual companies can vary quite widely at a given rating level, but, on average, the relationship between ratings and spread tends to hold. Charts 14 and 15 show a box and whisker plot for nonfinancial CDS spreads for U.S. companies on Feb. 16, 2011. The box represents the dispersion of the middle 50% of the sample for each rating, and the middle line is the median of the sample. The lines extending outward from the box represent the distance to the maximum and minimum spreads in the sample. Although there are some outlying values at many rating levels, CDS spreads tend to increase as ratings decrease.

Chart 14

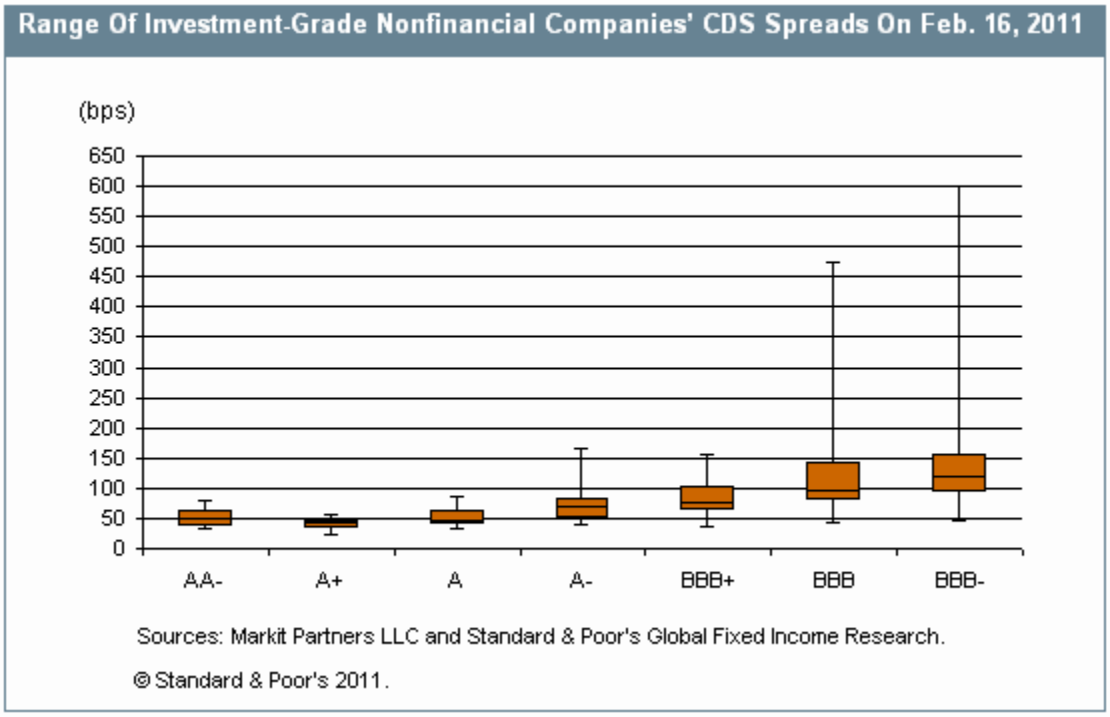

Range Of Investment-Grade Nonfinancial Companies' CDS Spreads On Feb. 16, 2011
(bps)
650
600
550
500
450
400
350
300
250
200
150
100
50
0
AA-
A+
A
A-
BBB+
BBB
BBB-
Sources: Markit Partners LLC and Standard & Poor's Global Fixed Income Research.
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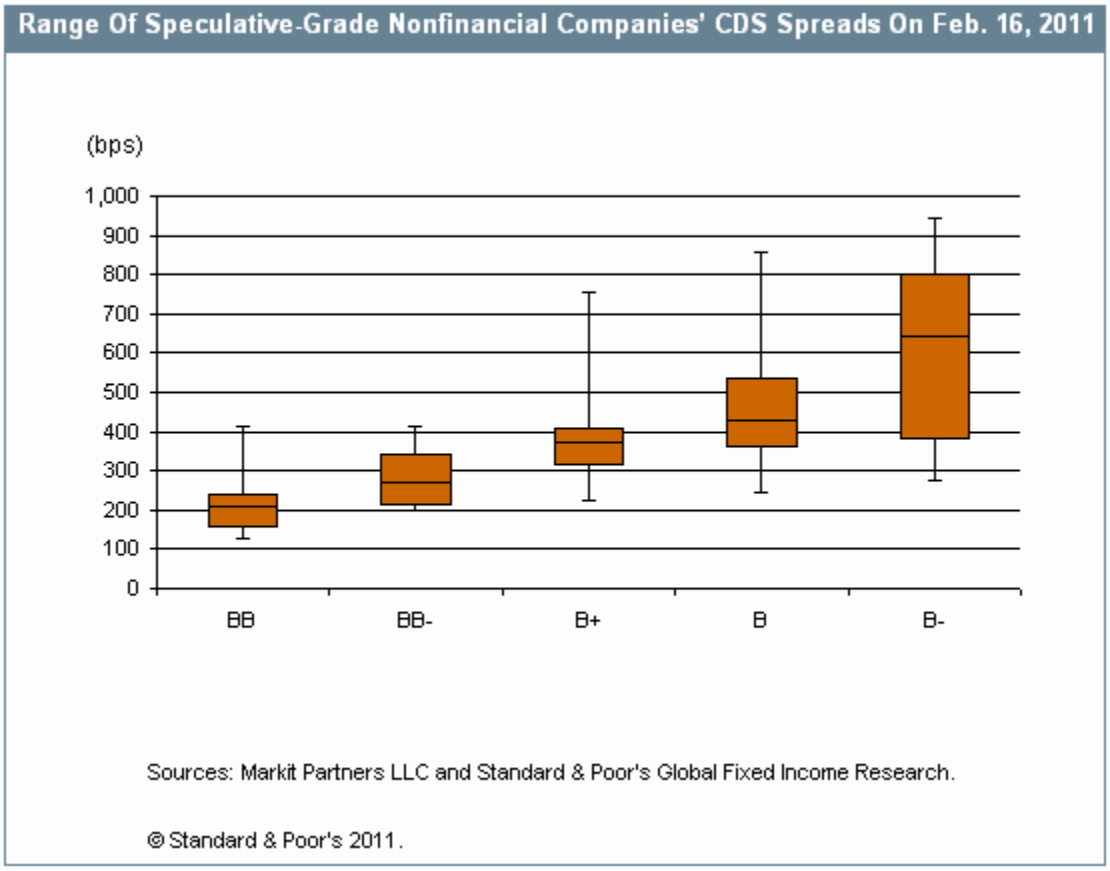
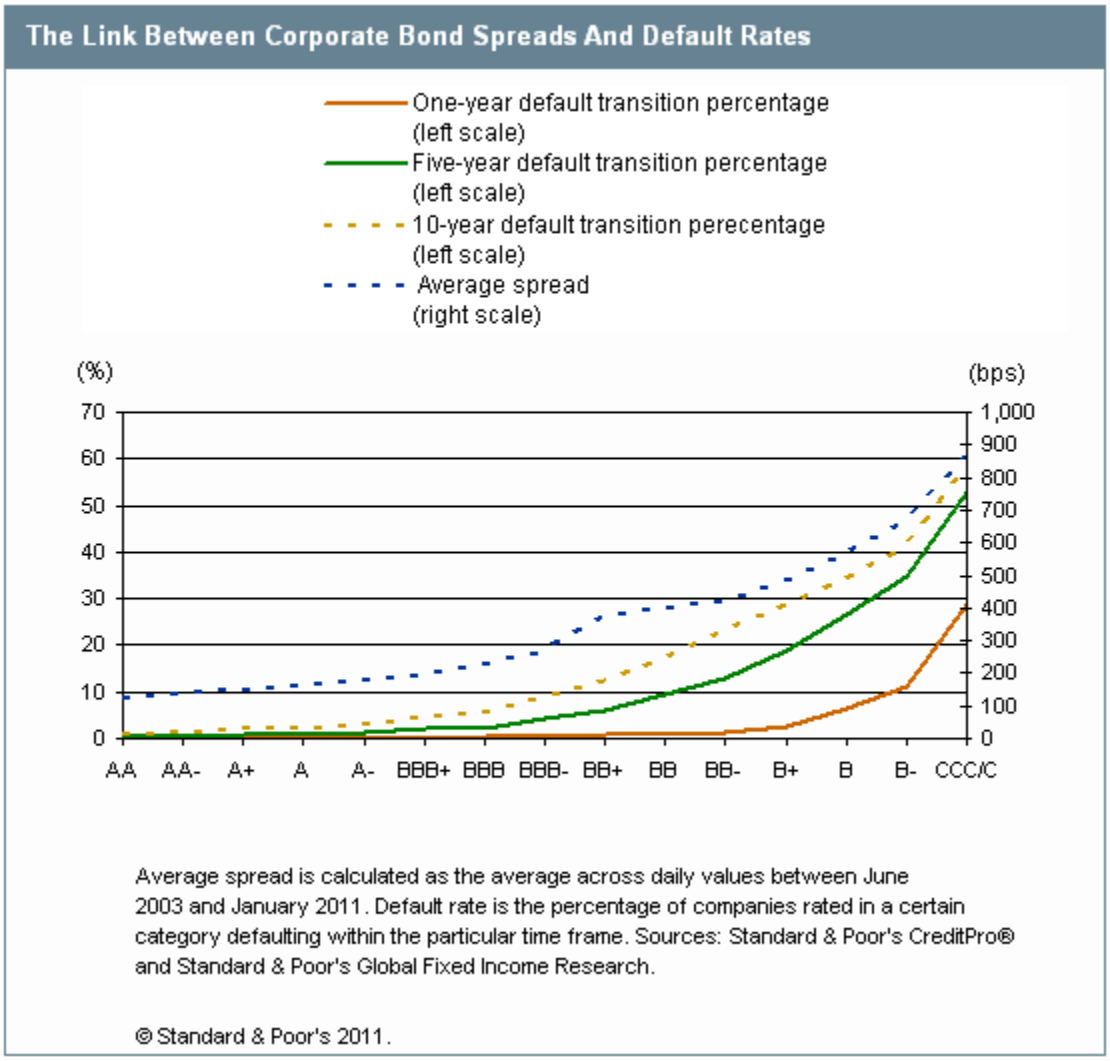
Chart 15



- Not only did we find a negative relationship between spread (or yield) and ratings, but the relationship is also nonlinear. This results from the fact that the relationship between ratings and default risk is nonlinear, and if bond prices are capturing expectations of default risk, then we should also see this relationship in spreads (see chart 16). (For more information on defaults and rating transitions for U.S. corporate issuers, see "2009 U.S. Corporate Default Study And Rating Transitions," published July 15, 2010.)

Chart 16



Related Research

- Ederington, Louis H., Jess B. Yawitz, and Brian E. Roberts, 1987, "The informational content of bond ratings," The Journal of Financial Research 10, 211-226
- West, Richard R., 1973, "Bond ratings, bond yields and financial regulation: Some findings, "Journal of Law and Economics 16, 159-168