S&P CAPITAL IQ

Solutions Exchange Product Spotlight

Cross-Asset Update: Credit Metrics Linked To Equity Performance

James Elder
Solutions Architect
(1) 212-438-7886
james_elder@spcapitaliq.com

Joshua Mintz
Solutions Architect
(1) 212-438-7549
joshua_mintz@spcapitaliq.com

Solutions Exchange is developed by S&P Capital IQ's Solutions Architects, a separate and independent team at Standard & Poor's. The objective of this analysis is to gain greater insight into specific events and trends in the market using S&P Capital IQ data and analytics solutions.

The market is placing greater emphasis on cross-analytic indicators and analytics, in part because of the coordinated movements in the market during the recent financial crisis. During this period, multiple asset classes, such as equity and fixed income, moved in a largely similar downward direction when they were previously believed to react dissimilarly in economic cycles. The S&P Capital IQ Solutions Architect team analyzed historical equity performance with credit indicators to determine if there has been any correlation between these metrics over the past one, three, and five years, by examining their starting and ending values over these periods. Our findings indicate that these credit metrics are correlated with equity returns, indicative of corporate structure effectiveness and good management practices.

- Credit-based and equity-based metrics exhibit certain correlations over the one, three, and five year periods studied.
- Improvements in CreditModel quantitative credit scores correlated positively with equity prices.
- Deteriorations in probability of default (PD) scores correlated negatively with equity prices.
- Three notch positive changes in CreditModel scores corresponded with average equity returns of 90.22% and median returns of 40.2% over five years, and average returns of 162.41% and median returns of 119.2% over three years.

Universe

We used the nonfinancial constituents {1} of the S&P 500 Index (as of April 17, 2012) as our universe of companies. We then utilized the following three major datasets to conduct the analysis, for as many companies as available within that universe:

- S&P Capital IQ cumulative equity performance (ex-dividends) (as of April 17, 2007, April 17, 2009, April 15, 2011 {2}, and April 17, 2012)
- PD scores (as of April 17, 2007, April 17, 2009, April 15, 2011, and April 17, 2012). PD scores, when analyzed on the whole and at the industry level, utilize the forecasted PD percentage. When analyzed for observed equity movements, we mapped to a ratings-equivalent scale.
- CreditModel Scores (CM) (as of second-quarter 2007, second-quarter 2009, second-quarter

2011, and fourth-quarter 2011. Credit model scores for 2012 are as of year-end 2011 because they rely on publicly filed financial statements. The fourth quarter of 2011 was the most complete dataset available for this analysis). CreditModel scores are a purely quantitative view of a company's creditworthiness and are mapped to a lower-case ratings scale in order to differentiate it from Standard & Poor's Ratings Services' credit ratings.

Universe Level Analysis

We began our analysis by looking at PDs and CM scores over one, three, and five years to determine which metrics were most correlated over these timeframes. When looking at PDs on one, three, and five year timeframes, we observed a generally negative correlation between stock price performance and the PD. This is not surprising given that equity prices and volatility are components of the PD model used. The interaction is such that a rising stock price generally lowers the PD, signaling improvement. Conversely, a declining stock price generally increases the PD, signaling deterioration. Interestingly, we found that this relationship was strongest over the one-year time period and slightly less effective over three years, with the weakest relationship over the five-year period. We believe this could be due to several factors, including that the PDs referenced are a one-year forward-looking view of default risk. However, 2008 to 2012 was also a very volatile time in the stock markets, and equity volatility in 2008 manifested into increased risk for many of the companies in our analysis. We are therefore interested in observing these relationships as we move forward, when the equity volatility of 2008 no longer exists as a part of our sample set.

We next turned to a purely financial analysis via CreditModel, which does not incorporate equity prices directly, through which we can observe a different relationship than what the PDs exhibit, in two respects:

- CM scores are largely positively correlated with equity price movements; and
- They exhibit a stronger relationship as time progresses.

This is particularly interesting because CreditModel does not incorporate market inputs yet the market appears to have recognized improvement in financial management. We believe this is due to two factors:

- Positive relationships between CM scores and equity prices indicate that better balance sheet management manifests itself in improving fiscal results, and the equity markets recognize this fiscal improvement; and
- Because CM scores rely on quarterly financials and are less subject to volatility than a market-driven PD, changes in CM scores occur more slowly.

Table 1

PD And CM Score Correlations To Equity Performance Over One, Three, And Five Years

--PD correlation (%)--			--CM correlation (%)--		
One year	Three year	Five year	One year	Three year	Five year
(15.66)	(12.76)	(8.86)	3.02	29.78	32.51

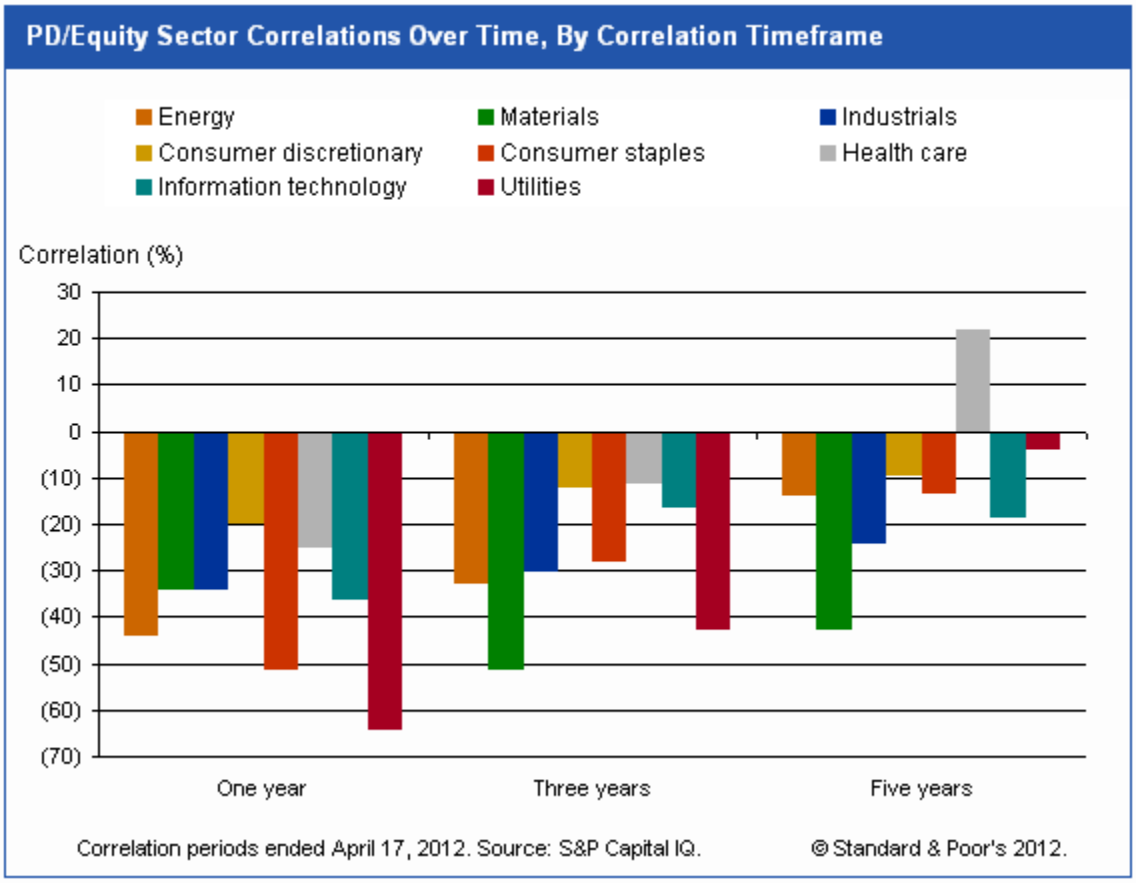
Correlation periods ended April 17, 2012. Source: S&P Capital IQ.

Industry Level Analysis

We next observed these PD relationships by sector. The strongest correlation between PD and equity performance exists for the utilities sector, with a negative 64.60% correlation over the past year (see chart 1). The energy, materials, industrials, and information technology sectors also exhibited significant negative correlations of greater than negative 30%. Health care stands out in the analysis due to a positive correlation over five years. This is largely attributable to the performance of Express Scripts Holding Co., which has experienced a 164% price change over five years along with a PD change of 1,867%. This is partially attributable to their relatively high equity price volatility over the past year. The health

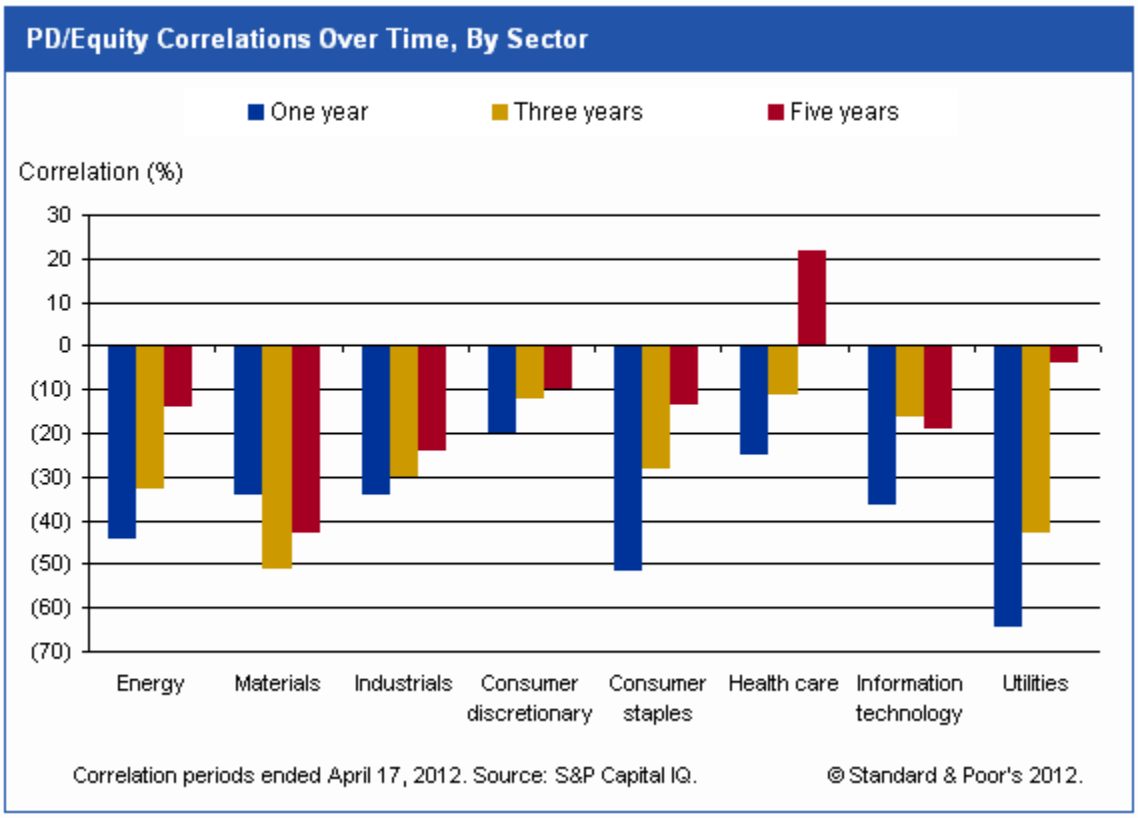
care sector, excluding Express Scripts Holding Co., exhibited a negative 8.7% correlation between PD and equity prices over five years, which maintains the relationship exhibited by the other sectors. We omitted sectors that had fewer than 2.5% of the total number of data points.

Chart 1



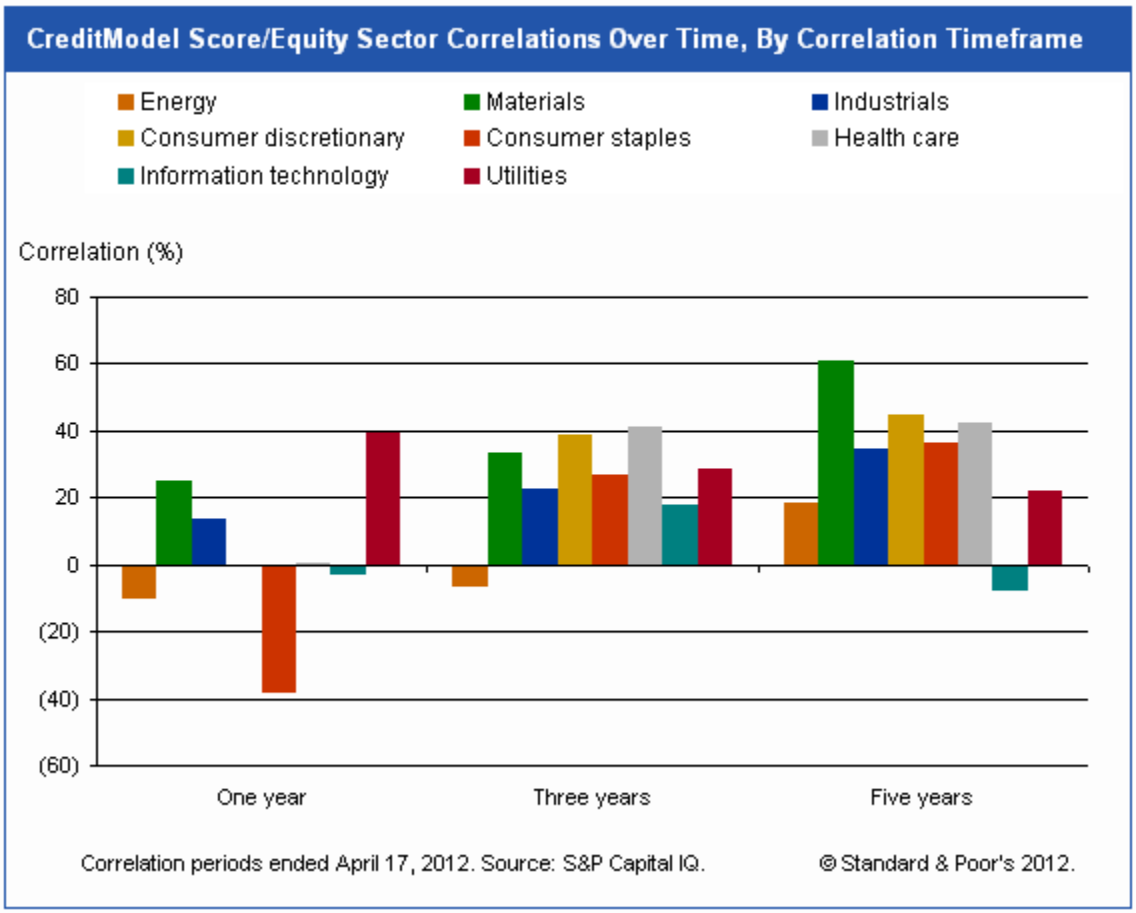
We observed that the materials sector exhibits stronger correlations over the three-year period than the one- and five-year periods (see chart 2). However, one-year PDs are generally more highly correlated with equity prices within specific industries, consistent with the broader trends for the universe.

Chart 2



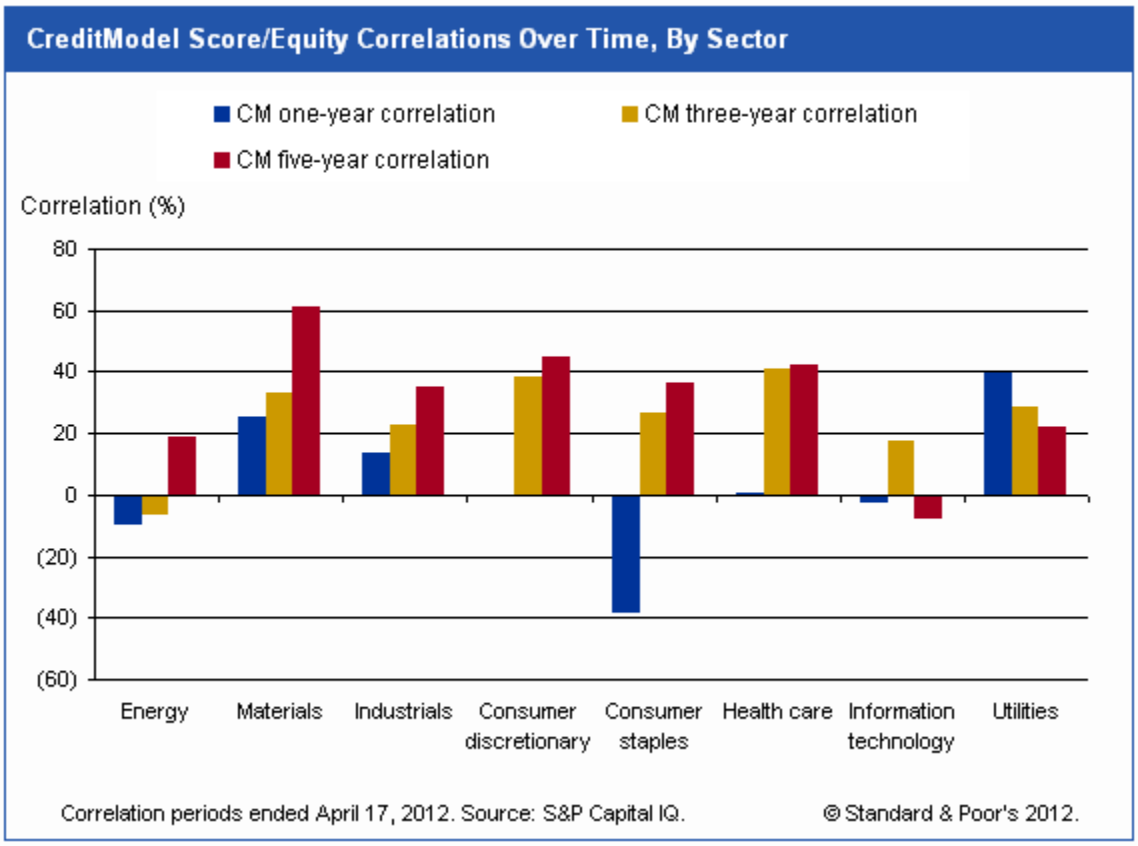
As we observed on the universe level analysis, CM scores displayed generally increasing positive correlations across the sectors as well. Some sectors demonstrate negative correlations in specific time horizons (see chart 3).

Chart 3



When we observed CM scores by sector, the increase in correlation over time is still evident. The materials, consumer discretionary, and health care sectors exhibit the strongest correlations over five years, with correlations of more than 40% (see chart 4). The utilities sector is the only one that reflects a declining relationship with CM scores over time. This may be due to the regulated nature of utilities and perhaps the inability to pass along the full impact of energy costs in a volatile energy market, among other factors.

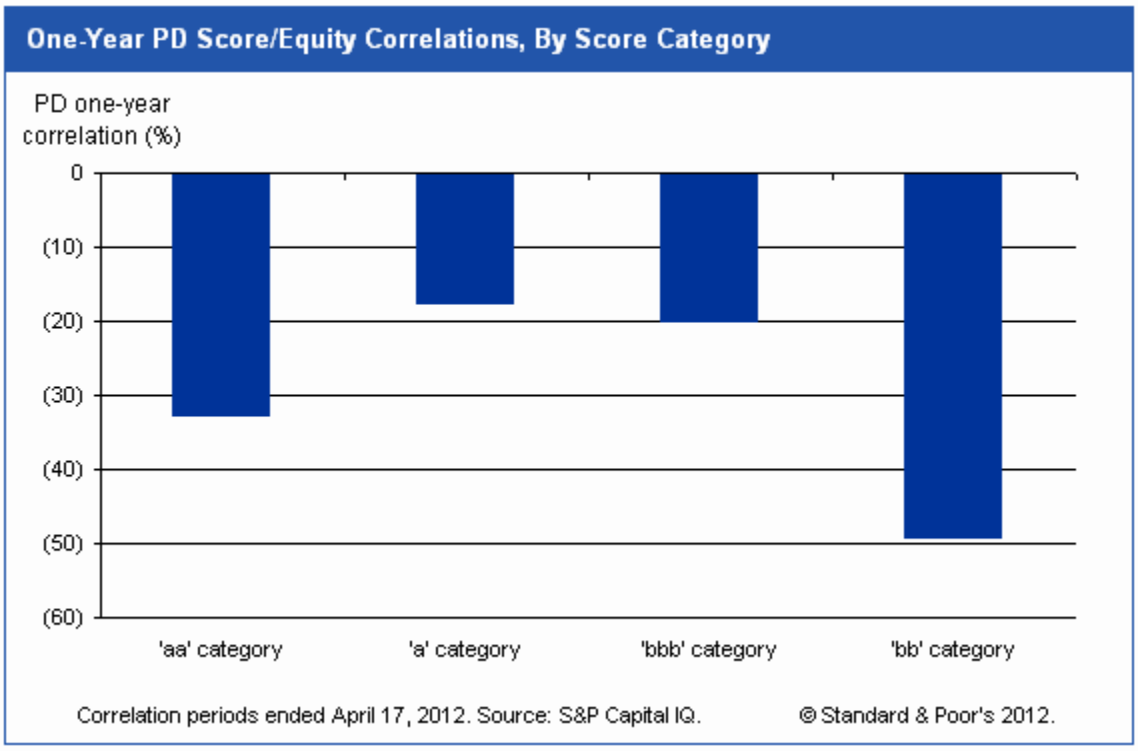
Chart 4



Investigating Trends By Score Category

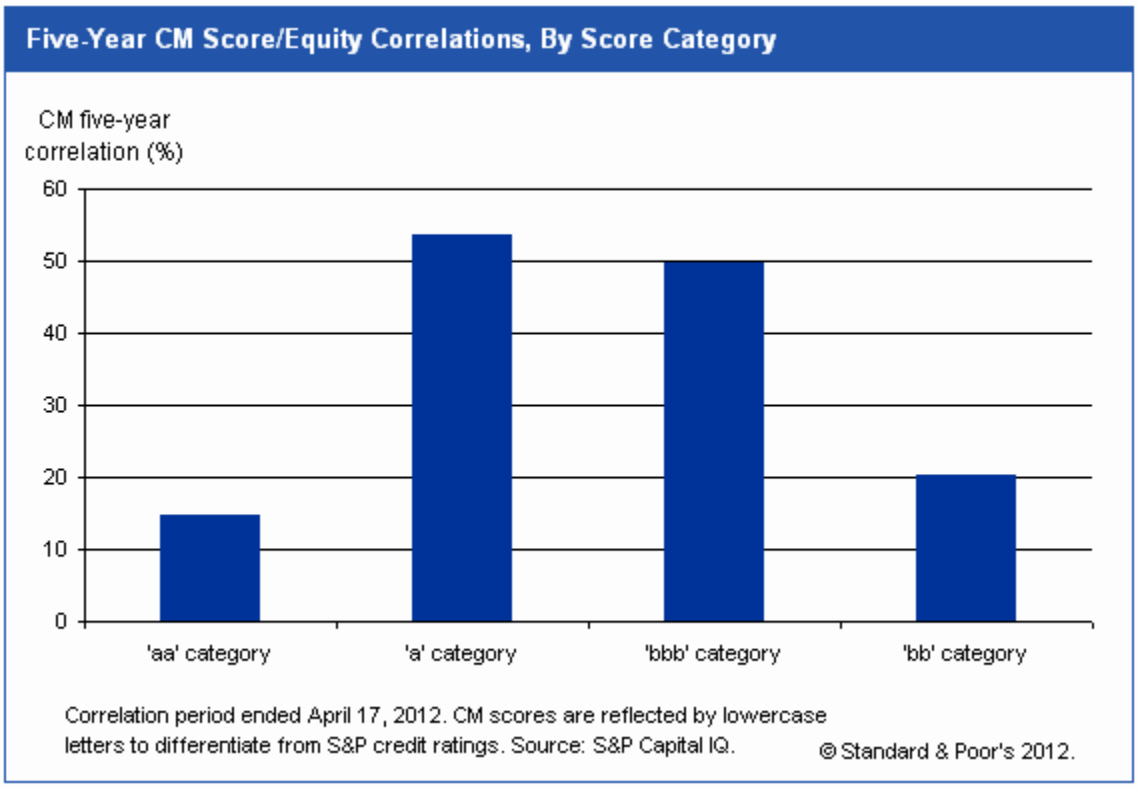
PD to equity correlations have been strongest over one year as demonstrated above. With that in mind, we mapped the companies' PD to a lower-case ratings equivalent based on historical default rates for each ratings category, in order to differentiate it from a Standard & Poor's credit rating. We observed a general relationship between declining PD scores and increasingly negative correlations. With this information, we believe that lower-quality companies, as determined by high PDs, are more likely at risk for negative events and negative returns over a one-year period (see chart 5). We omitted PD score categories that had fewer than 2.5% of the total number of data points.

Chart 5



Likewise, five-year CM correlations are the strongest so we stratified this universe by rating category level. We found that the strongest relationship was with companies scoring in the 'a' and 'bbb' ratings categories, which had correlations of 53.7% and 49.63%, respectively (see chart 6). They are also the most populous datasets, with 33.8% and 49.5% of scores, respectively. We omitted CM score categories that had fewer than 2.5% of the total number of data points.

Chart 6



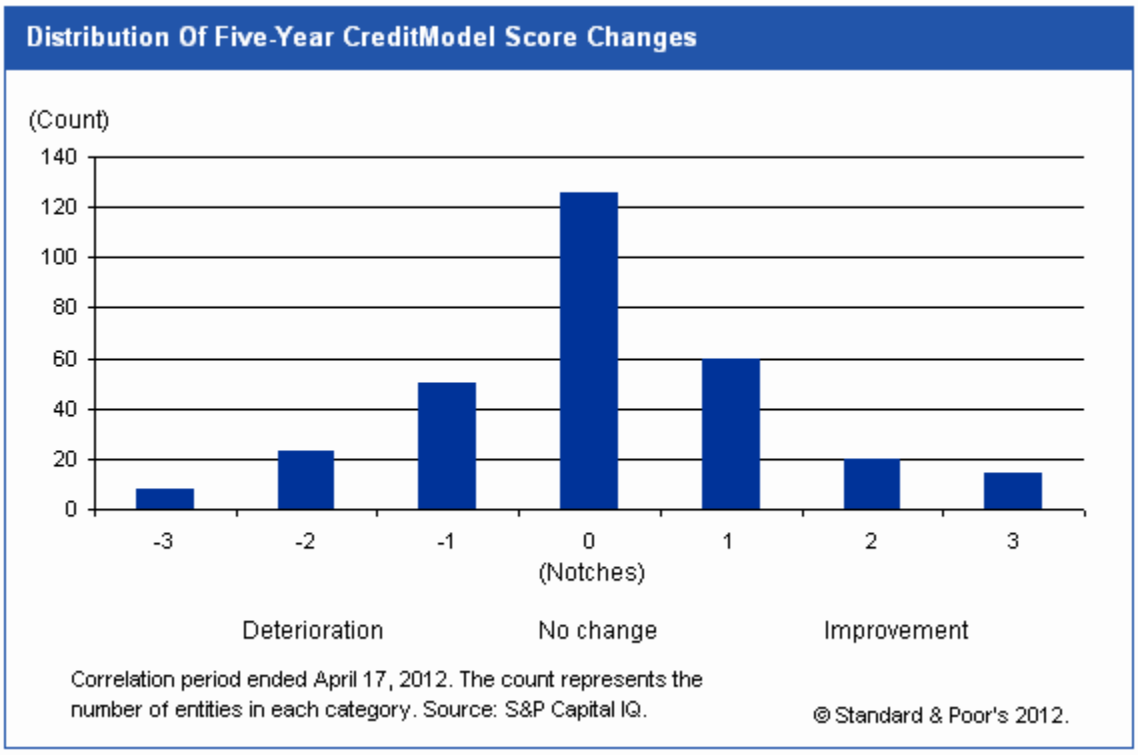
Credit Model Score Changes Vs. Equity Price Movements

Taking a deeper look at specific equity performance associated with CM score changes, we examined CM score changes and equity returns for three-year (April 17, 2009, to April 17, 2012) and five-year (April 17, 2007, to April 17, 2012) periods. CM score changes represent movement in the score by a certain number of notches. For example, a score improving from 'a' to 'a+' represents a one-notch change and a score deteriorating from 'a+' to 'a' represents a negative one-notch change. We included entities in the sample if they had both a CM score and equity pricing information for a given time period. Of S&P 500 Index constituents, 349 and 317 companies met these criteria for the three- and five-year time periods, respectively. We identified outlier data points as any CM score change category accounting for less than 2.5% of the total eligible data points. We subsequently excluded the outliers from the data set, resulting in nearly 95% of eligible entities in both time periods.

Five-Year Credit Model Movements

For the five-year time period, CM scores distributed largely around the "no change" (0) category (see chart 7). When we examined the scoring categories' average and median equity returns, we found that in general, equity prices increased as CM scores improved. The inverse exhibited decreasing CM scores, resulting in negative returns for these scoring categories.

Chart 7



In comparing the scoring category returns to those of our subset of the S&P 500 Index, the degree of outperformance for no change or improvement categories becomes more evident. During the five-year time period, our subset of the S&P 500 Index exhibited an average return of 22.42% and a median return of 4.88% (see chart 8). The S&P 500 Index returned negative 5.48% over this time, but note that these results are not directly comparable due to different methodologies in return calculations and constituents. Constituents that preserved their CM score (no change) on average increased equity values by 13.84%, with median increases of 3.89%. At a CM score change of positive 1, the category outperformed the subset, with equity returns on average of 44.6% and median returns of 25.75%. With a score improvement of positive 2, average returns increased to 59.82%, while the median return reduced to 22.7%. The positive 3 category yielded average returns of 90.22% and median returns of 40.2%.

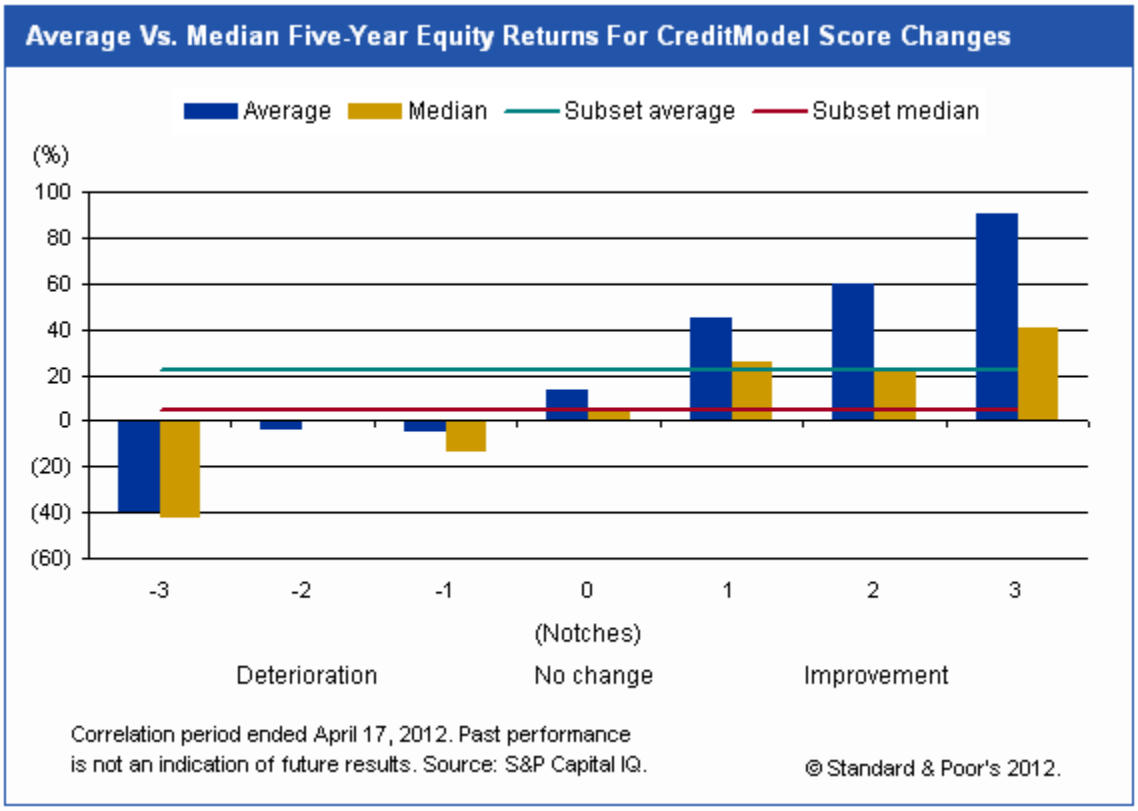
Although it is out of sample for the overall analysis, this outperformance is particularly notable for Priceline.com Inc., with equity returns of 1,161% and a 4-notch improvement in credit quality. Perrigo Co. also demonstrates notable returns of 456%, with a 3-notch increase in credit quality. CF Industries Holdings Inc. also experienced returns of 324% over five years, with a 2-notch increase in credit quality.

The deterioration categories produced lower returns than the no change and improvement categories. At a change of negative 1, average and median equity returns were negative 4.72% and negative 14.05%, respectively. When CM scores declined by two categories, the overall category improved with average returns of negative 4.34% and median returns of 0.75%. A portion of this improvement can be attributed to Direct TV's 102.5% equity return during this period. This trend was reversed at changes of negative 3, with average returns of negative 39.9% and median returns of negative 42.15%.

Within the scope of our analysis for the five-year time period, entities with positive improvement, on the aggregate level, outperformed both the subset and the aggregated performance of entities with deteriorating CM scores both when

comparing on average and a median basis.

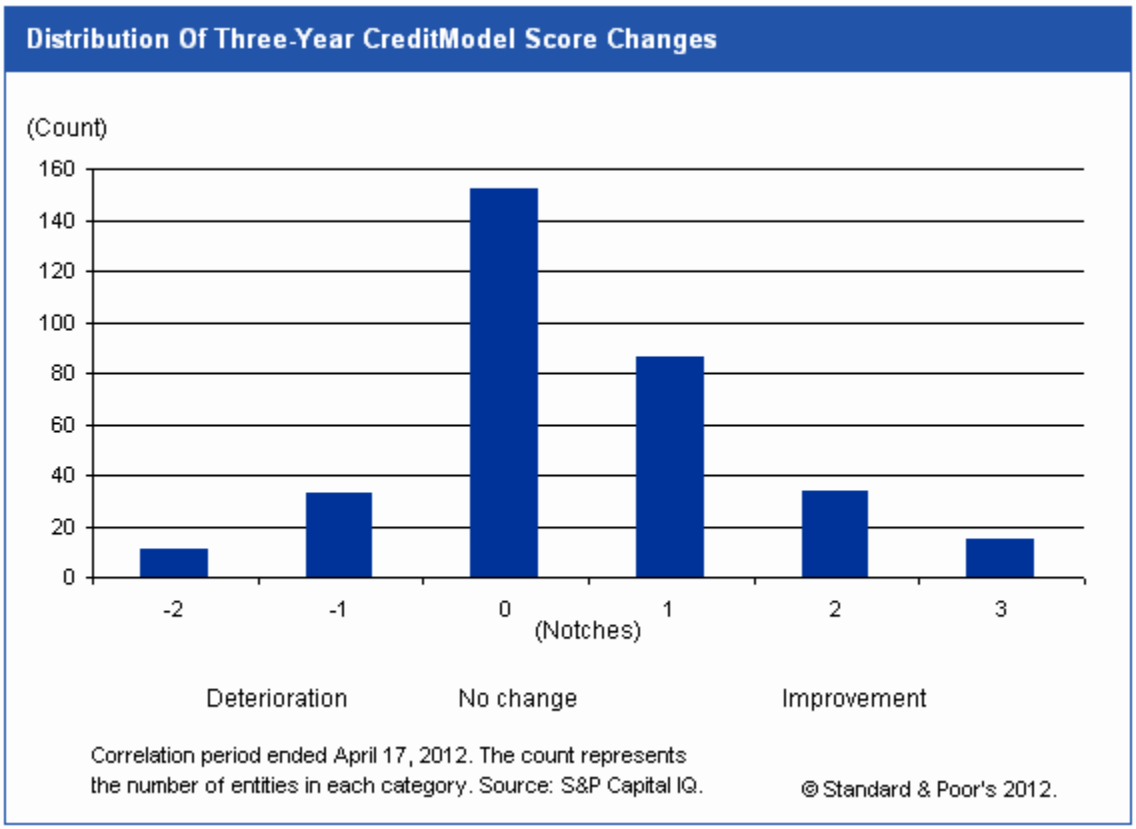
Chart 8



Three-Year Credit Model Movements

Similar to the five-year time period, the no change scoring category was the largest for the three-year time period (see chart 9). Again, the no change and improvement scoring categories outperformed the deterioration scoring category.

Chart 9



Over the course of the three-year time period, individual constituent equities largely saw positive returns as the U.S. economy exited the recession. All CM scoring categories saw positive improvements measured by the median and average. However, when performance was examined relative to our subset of the S&P 500 Index, we continued to observe trends similar to that of the five-year time period.

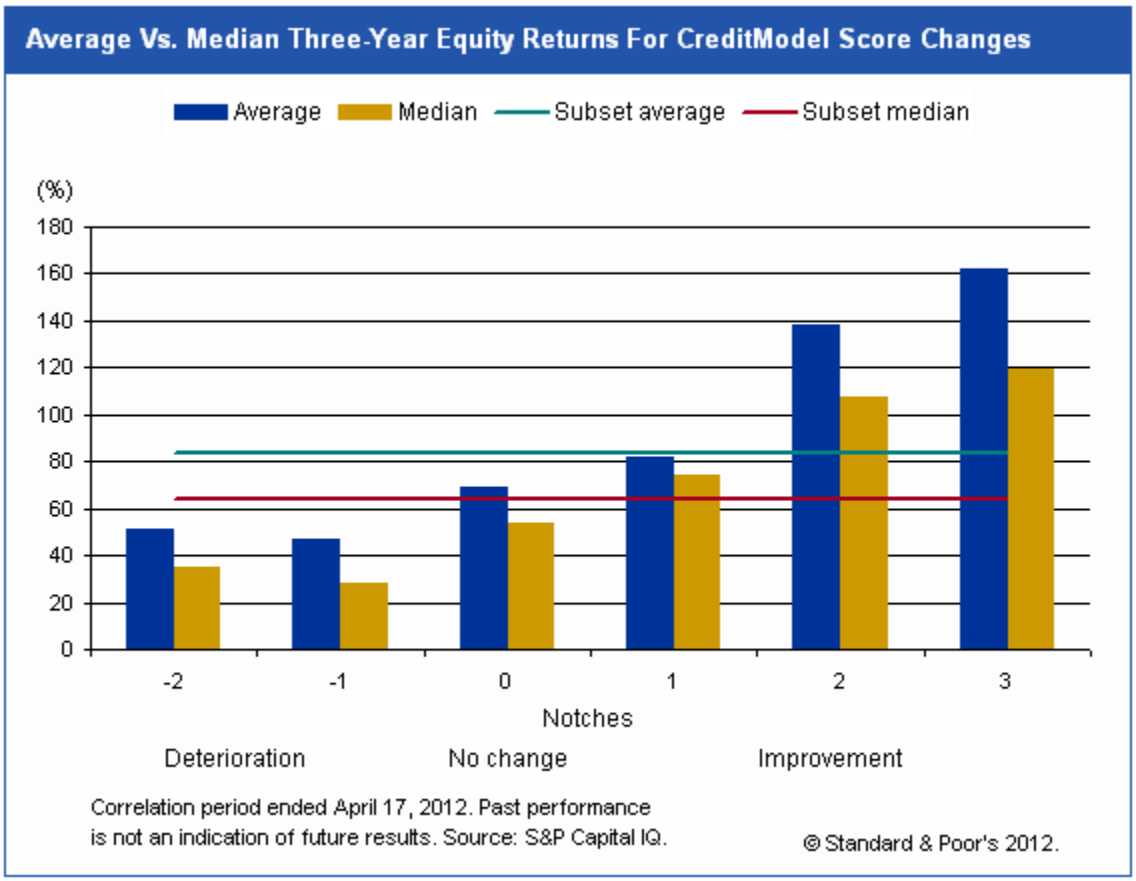
During the three-year time period, our subset of the S&P 500 Index exhibited an average return of 83.79% and a median return of 63.8% (see chart 10). The S&P 500 Index returned 59.93% over this time but please note that these results are not directly comparable due to different methodologies in return calculations and constituents. For the deterioration scoring categories, we observed underperformance relative to the index measured by both the median and average. At the negative 1 score change category, the aggregated average and median equity returns were 47.12% and 28.00%, respectively. In comparison, the negative 2 score change category performed better than the negative 1, with average equity returns of 50.79% and median equity returns of 34.8%. This superior performance even with the lower CM score change could be partially attributed to salesforce.com's 307% equity return during the period based on the lower number of constituents (11).

For the no change category, with the largest number of constituents (152), the average returns (68.88%) outperformed our subset of the S&P 500 (nonfinancials) but underperformed when measured as a median (53.55%). At a score increase of positive 1, the category returned on average 81.57%, with median returns of 73.9%. When the score increased to positive 2, average returns increased to 138%, and median returns increased to 107.8%. This trend continued at a score increase of positive 3, with equity returns on average of 162.41% and median returns of 119.2%. This outperformance is particularly notable for Priceline.com Inc., with equity returns of 683% and a 3-notch improvement in credit quality.

Further, Fossil Inc. experienced 614% equity returns with a 2-notch improvement in credit quality.

Within the scope of our analysis for the three-year time period, entities with positive improvement, on the aggregate level, outperformed both the subset and the aggregated performance of entities with deteriorating CM scores, both when comparing on a median basis. Entities with at least 2-notch improvements also outperformed the subset average.

Chart 10



Conclusion

We observed correlations between PDs, PD scores, CM scores, and equity prices over one-, three-, and five-year horizons. PDs have demonstrated the most significant correlations over shorter durations, and CM scores have demonstrated the most significant correlations over longer durations. From this, we believe that market participants interested in equity price movements may find PDs and CM scores of interest. Furthermore, companies that display decreasing PDs or increasing CM scores over time may have positive equity price movements. Furthermore, the larger the magnitude of these score changes, particularly in CM scores, the larger the corresponding equity price movement.

Going forward, we look to continue to examine more granular trends including investigating the causality between factors.

Getting Behind The Data

To perform the analysis in this article, we used the following S&P Capital IQ solutions:

S&P Capital IQ Platform

S&P Capital IQ offers the highest quality information on both public and private capital markets along with powerful applications for desktop research, screening, real-time market data, backtesting, portfolio management, financial modeling, quantitative analysis, and more. Our product suite empowers the world's leading financial professionals to identify investment opportunities, draw unique insights, and increase returns.

CreditModel

CreditModel is a Web-based suite of 46 industry models that use financial statement information to estimate the credit quality of publicly traded and privately owned mid-cap and large corporations. A rigorous, segment-focused modeling approach that uses a unique series of newly retrained region- and industry-specific models based on the Global Industry Classification Standard (GICS). Efficient access to estimates of creditworthiness ("credit scores") for over 50,000 companies in a pre-scored database. The scores are represented by familiar Standard & Poor's letter grade rating symbols using lowercase to indicate they are quantitatively derived. Flexibility to quickly derive scores on additional companies by simply entering key financial ratios into the CreditModel engine. A glimpse into the future with sensitivity analysis and stress testing capabilities to evaluate the impact of changes in inputs to stimulate upgrades, downgrades, and resilience. The models are rigorously validated, and credit model scores demonstrate a very high correlation with Standard & Poor's credit ratings.

Credit Risk Tracker

S&P Capital IQ's Credit Risk Tracker is a Web-based tool that produces forward-looking, one-year probability of default estimates based on a time series of macroeconomic, financial, and industry-specific variables for privately held small and medium-sized enterprises (SME).

Notes

{1}Financial company statements are significantly different than for nonfinancial companies, and as such, a different quantitative model set must be used which is the subject of a future iteration of this research. Our subsets of the index excludes other nonfinancial companies that do not have an equity price, CM score or PD over the specified timeframe.

{2}April, 17, 2011, was a Sunday, so we utilized the prior business day.

This report was prepared by the S&P Capital IQ Global Markets Intelligence group, formerly known as the Global Markets Intelligence research group. This group is analytically and editorially independent from any other analytical group at S&P.