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Default, Transition, and Recovery:

## Why Settle For Average?: Understanding The Variation In Corporate Default Rates And Ratings Transitions

**Global Fixed Income Research:**

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## Default, Transition, and Recovery:

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The global economic and financial downturn that began in the U.S. in late 2008 has proven to be the most severe since the Great Depression. The downturn's negative effects are still being felt globally in the form of higher default rates, higher costs of debt funding, and a generalized decline in credit quality. We believe that volatility of this magnitude underscores the need for a well-rounded approach to assessing corporate credit risks that supersedes the simple use of averages.

Standard & Poor's Global Fixed Income Research publishes many default studies annually, and many end users focus on the transition matrices and cumulative default rate tables published in those reports. Although these metric-based data are useful on their own, we believe it is also important to consider the fluctuations seen throughout the various business and economic cycles that they cover, as well as the fundamental regime changes in corporate credit conditions that have occurred in the last 31 years.

These short-, medium-, and long-term fluctuations in credit metrics range from default rates, extreme multi-notch downgrades, fallen angel activity (rating actions regarding entities most at risk of downgrade to speculative grade), and other ratings transition rates. Variability in default rates is visible across geographic regions and industries, with variations in historical default rates ranging from periods of low correlation between industries to periods of extremely high correlations. Therefore, we believe that in periods of widespread economic downturn the standard approach of holding a diversified portfolio in order to mitigate risk may prove no safer than holding a less diversified portfolio. As a result, we continue to examine a broad array of statistics normally associated with long-term default rates, as well as the changing fundamentals that underpin these results.

The key observations from this report include:

- Creditworthiness is a multifaceted phenomenon. We view the likelihood of default, which encompasses both capacity and willingness to pay, as the centerpiece of creditworthiness, supported by other factors of creditworthiness such as payment priority, recovery, and credit stability.
- Periods of severe financial disruption don't occur frequently, but they often create sharp drops in credit quality. While all industries are more vulnerable to default during periods of heightened stress, financials (which include insurance companies and financial institutions) tend to see sharp declines in credit quality before default. At the same time, these companies generally have stronger credit profiles than nonfinancials and, as default statistics have shown historically, are less likely to default than the nonfinancials.
- Observed default rates for all rating categories do not remain constant over time, but instead rise and fall during periods of expansion and contraction, respectively. The relative severity of default rates between rating categories also displays a monotonic increase between adjacent ratings as we travel down the ratings spectrum.
- Variations between sector default rates should not be interpreted to mean that certain sectors are intrinsically more or less susceptible to default than others. A complex interplay of factors (such as strategic development, leverage

composition, management vision, or government support/regulation) set against a dynamic background of economic and credit movements means that some sectors are affected differently than others in terms of default exposure. While periods of greater economic hardship typically raise a greater number of sectors' default rates, not all sectors experience the same level of severity in the number of defaults within the same cycle.

- Observed rating transitions also display considerable variation with changes in market conditions, as well as other key indicators of ratings performance, such as Gini ratios. Year-to-year variations can be sizeable, making the relative dispersion of historical statistics a key input into any scenario analysis or modeling assumptions.

## Variations In Default Rates

Ratings have consistently proven to be good relative indicators of creditworthiness. Companies that are more highly rated default less frequently than lower-rated issuers. In addition, default rates tend to increase monotonically as credit ratings decline, with default rates consistently higher the further one moves down the ratings scale. This is true not only in the aggregate but also in individual years of considerable economic tumult, which, therefore, makes the reliance on long-term averages somewhat myopic in model prediction or scenario analysis (see table 1 and chart 1).

We examined familiar average cumulative default rates, based on survival that are commonplace in our annual default studies, and expanded them to display the variation of these averages (see table 1). We calculate the standard deviation data in the rows in table 1 under the default rates from time series of individual static pool experiences. However, unlike the standard deviations in tables 3 and 4, which are calculated from the time series of default rates that are not conditional on survival, the default rates in table 1 are averages, conditional on survival. The standard deviation data are also equally weighted, while the default rates are weighted averages. Because of these discrepancies, we also show an alternative, or complement, to the standard deviations in table 1: the standard error. The standard error acts as another measure of the dispersion of the default rates (see the footnote in table 1 for the methodology). In general, standard deviations are larger than the standard errors, but both measures of dispersion can be comparably large relative to the default rate they apply to. This is particularly true for the highest rated categories. Yet despite these fluctuations, the rank-ordered power of the ratings system is evident in the consistent increase in default rates the lower one moves down the ratings spectrum.

**Table 1**

| Global Corporate Cumulative Average Default Rates, 1981-2012 (%) |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| Rating   | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | Year 14 | Year 15 |
| AAA  | 0.000  | 0.027  | 0.139  | 0.253  | 0.369  | 0.489  | 0.550  | 0.645  | 0.709  | 0.776   | 0.811   | 0.848   | 0.887   | 0.969   | 1.057   |
| Standard deviation   | 0.000  | 0.205  | 0.390  | 0.496  | 0.607  | 0.698  | 0.748  | 0.808  | 0.809  | 0.807   | 0.811   | 0.815   | 0.818   | 0.889   | 0.961   |
| Standard error   | 0.000  | 0.027  | 0.062  | 0.085  | 0.104  | 0.121  | 0.130  | 0.142  | 0.151  | 0.161   | 0.168   | 0.176   | 0.184   | 0.199   | 0.215   |
| AA   | 0.023  | 0.070  | 0.142  | 0.259  | 0.373  | 0.492  | 0.597  | 0.686  | 0.769  | 0.856   | 0.937   | 1.011   | 1.091   | 1.164   | 1.227   |
| Standard deviation   | 0.074  | 0.119  | 0.186  | 0.302  | 0.381  | 0.484  | 0.552  | 0.618  | 0.669  | 0.707   | 0.705   | 0.716   | 0.685   | 0.680   | 0.686   |
| Standard error   | 0.013  | 0.023  | 0.034  | 0.047  | 0.057  | 0.067  | 0.075  | 0.082  | 0.089  | 0.096   | 0.104   | 0.111   | 0.120   | 0.129   | 0.138   |
| A  | 0.075  | 0.185  | 0.320  | 0.481  | 0.659  | 0.863  | 1.106  | 1.316  | 1.536  | 1.772   | 1.973   | 2.139   | 2.305   | 2.452   | 2.662   |

**Table 1**

| Global Corporate Cumulative Average Default Rates, 1981-2012 (%) (cont.) |        |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Standard deviation   | 0.114  | 0.205  | 0.266  | 0.352  | 0.432  | 0.474  | 0.535  | 0.585  | 0.674  | 0.776  | 0.846  | 0.894  | 0.861  | 0.839  | 0.813  |
| Standard error   | 0.016  | 0.026  | 0.036  | 0.045  | 0.054  | 0.064  | 0.074  | 0.084  | 0.093  | 0.104  | 0.114  | 0.123  | 0.133  | 0.144  | 0.157  |
| BBB  | 0.238  | 0.666  | 1.135  | 1.714  | 2.304  | 2.877  | 3.381  | 3.883  | 4.380  | 4.884  | 5.409  | 5.856  | 6.300  | 6.763  | 7.217  |
| Standard deviation   | 0.265  | 0.604  | 0.861  | 1.071  | 1.304  | 1.493  | 1.598  | 1.640  | 1.675  | 1.546  | 1.376  | 1.297  | 1.161  | 1.042  | 0.974  |
| Standard error   | 0.030  | 0.052  | 0.070  | 0.089  | 0.107  | 0.124  | 0.140  | 0.157  | 0.174  | 0.193  | 0.214  | 0.235  | 0.258  | 0.284  | 0.312  |
| BB   | 0.896  | 2.700  | 4.801  | 6.803  | 8.616  | 10.354 | 11.862 | 13.227 | 14.500 | 15.601 | 16.509 | 17.309 | 17.989 | 18.565 | 19.255 |
| Standard deviation   | 1.051  | 2.344  | 3.446  | 4.075  | 4.618  | 4.916  | 4.928  | 4.840  | 4.710  | 4.336  | 4.333  | 4.415  | 4.524  | 4.437  | 4.485  |
| Standard error   | 0.072  | 0.127  | 0.173  | 0.210  | 0.243  | 0.275  | 0.304  | 0.334  | 0.364  | 0.394  | 0.422  | 0.454  | 0.490  | 0.529  | 0.570  |
| B  | 4.490  | 9.964  | 14.587 | 18.161 | 20.845 | 23.008 | 24.765 | 26.204 | 27.468 | 28.706 | 29.779 | 30.655 | 31.475 | 32.233 | 33.016 |
| Standard deviation   | 3.324  | 5.771  | 6.817  | 7.566  | 7.968  | 7.825  | 7.484  | 7.226  | 6.666  | 5.867  | 5.517  | 5.552  | 5.220  | 4.555  | 3.903  |
| Standard error   | 0.151  | 0.226  | 0.275  | 0.312  | 0.345  | 0.374  | 0.401  | 0.428  | 0.452  | 0.477  | 0.504  | 0.537  | 0.577  | 0.623  | 0.668  |
| CCC/C  | 26.853 | 35.891 | 41.189 | 44.311 | 46.758 | 47.849 | 48.824 | 49.691 | 50.801 | 51.679 | 52.450 | 53.312 | 54.268 | 55.155 | 55.155 |
| Standard deviation   | 12.698 | 13.945 | 14.253 | 14.217 | 13.972 | 12.961 | 13.139 | 12.658 | 11.572 | 10.561 | 10.856 | 11.334 | 11.751 | 10.856 | 10.377 |
| Standard error   | 0.925  | 1.033  | 1.118  | 1.188  | 1.229  | 1.272  | 1.319  | 1.379  | 1.456  | 1.568  | 1.715  | 1.835  | 1.948  | 2.056  | 2.107  |
| Investment grade   | 0.121  | 0.328  | 0.569  | 0.864  | 1.168  | 1.474  | 1.763  | 2.033  | 2.298  | 2.569  | 2.824  | 3.039  | 3.251  | 3.459  | 3.686  |
| Standard deviation   | 0.121  | 0.276  | 0.405  | 0.509  | 0.599  | 0.651  | 0.684  | 0.719  | 0.784  | 0.821  | 0.849  | 0.844  | 0.778  | 0.697  | 0.628  |
| Standard error   | 0.013  | 0.023  | 0.031  | 0.039  | 0.047  | 0.054  | 0.061  | 0.068  | 0.076  | 0.083  | 0.091  | 0.099  | 0.108  | 0.117  | 0.128  |
| Speculative grade  | 4.218  | 8.244  | 11.748 | 14.572 | 16.836 | 18.736 | 20.327 | 21.694 | 22.950 | 24.100 | 25.077 | 25.912 | 26.670 | 27.346 | 28.042 |
| Standard deviation   | 2.812  | 4.565  | 5.551  | 6.103  | 6.348  | 6.159  | 5.853  | 5.452  | 4.730  | 4.040  | 3.936  | 4.048  | 4.044  | 3.720  | 3.463  |
| Standard error   | 0.103  | 0.148  | 0.179  | 0.204  | 0.226  | 0.246  | 0.266  | 0.286  | 0.306  | 0.327  | 0.349  | 0.375  | 0.405  | 0.440  | 0.475  |
| All rated  | 1.568  | 3.105  | 4.470  | 5.626  | 6.586  | 7.416  | 8.122  | 8.735  | 9.302  | 9.833  | 10.298 | 10.690 | 11.053 | 11.389 | 11.742 |
| Standard deviation   | 1.058  | 1.842  | 2.383  | 2.705  | 2.834  | 2.780  | 2.683  | 2.581  | 2.443  | 2.341  | 2.352  | 2.340  | 2.234  | 2.029  | 2.013  |
| Standard error   | 0.038  | 0.056  | 0.068  | 0.079  | 0.088  | 0.096  | 0.104  | 0.112  | 0.120  | 0.129  | 0.138  | 0.148  | 0.159  | 0.171  | 0.185  |

\*The standard deviations are calculated in the same manner as those in tables 2 and 3. Standard error is the square root of:  $[(1-\#)]/N$ , where N = the population used as the denominator in the default rate calculations, and # = the default rate. Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

Chart 1

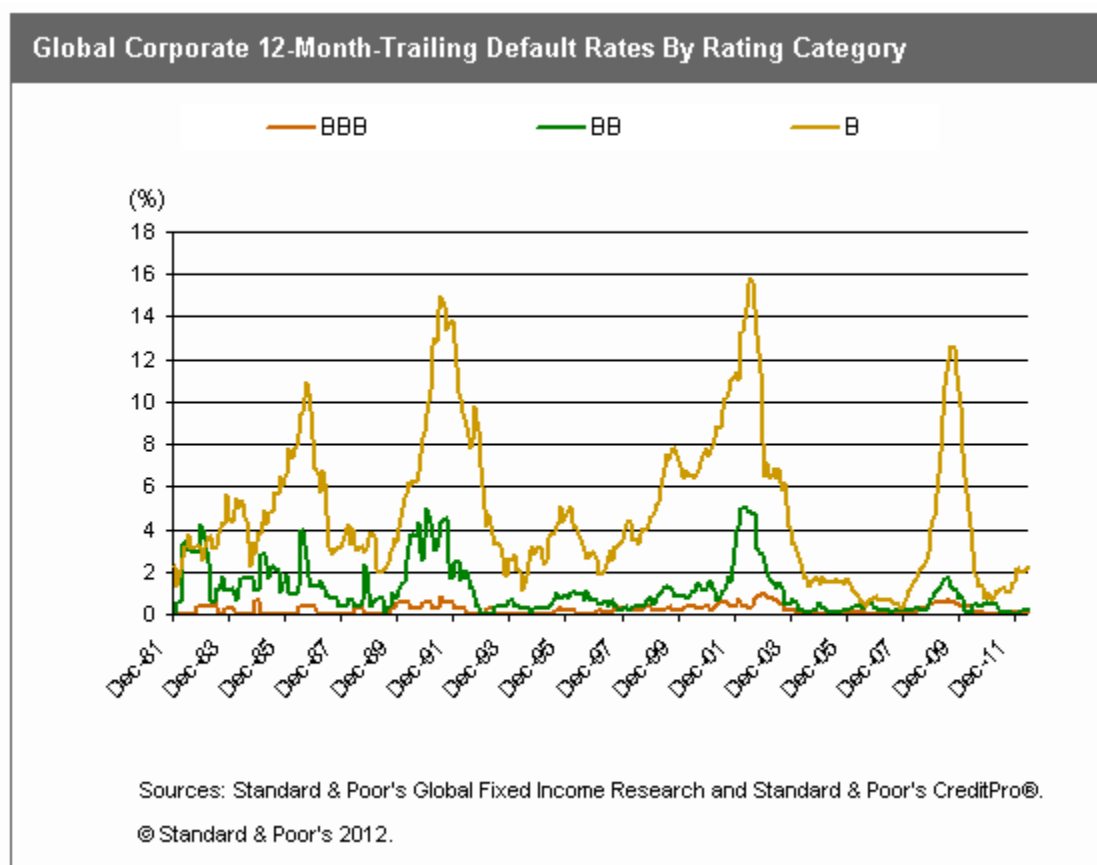


Table 2

| Descriptive Statistics For Global Trailing-12-Month Default Rates (%) |      |      |      |      |      |       |       |
|---|------|------|------|------|------|-------|-------|
|   | AAA  | AA   | A    | BBB  | BB   | B     | CCC/C |
| Average   | 0.00 | 0.02 | 0.06 | 0.21 | 1.14 | 4.85  | 23.40 |
| Median  | 0.00 | 0.00 | 0.00 | 0.14 | 0.75 | 3.80  | 21.79 |
| Standard deviation  | 0.00 | 0.07 | 0.11 | 0.23 | 1.16 | 3.50  | 11.57 |
| Minimum   | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25  | 0.00  |
| Maximum   | 0.00 | 0.38 | 0.53 | 1.02 | 5.02 | 15.84 | 51.98 |

Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

Table 3

| Static Pool Cumulative Global Corporate Default Rates, 1981 to 2012 (%) |         |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |
|---|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| Investment-grade ratings  |         |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |
| --Time horizon--  |         |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |
| Year  | Issuers | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | Year 14 | Year 15 |
| 1981  | 1,064   | 0.00   | 0.38   | 0.38   | 0.47   | 0.66   | 1.03   | 1.32   | 2.07   | 2.26   | 3.01    | 4.04    | 4.32    | 4.51    | 4.51    | 4.70    |
| 1982  | 1,093   | 0.18   | 0.27   | 0.37   | 0.55   | 1.01   | 1.28   | 2.01   | 2.20   | 3.02   | 4.12    | 4.39    | 4.67    | 4.67    | 4.85    | 4.85    |
| 1983  | 1,114   | 0.09   | 0.36   | 0.45   | 0.90   | 1.08   | 1.62   | 1.71   | 2.51   | 3.59   | 3.95    | 4.22    | 4.22    | 4.40    | 4.40    | 4.40    |

**Table 3**

| Static Pool Cumulative Global Corporate Default Rates, 1981 to 2012 (%) (cont.) |       |        |        |        |        |        |        |        |        |        |         |         |         |         |         |         |
|---|-------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|
| 1984  | 1,174 | 0.17   | 0.26   | 0.60   | 0.77   | 1.19   | 1.36   | 2.04   | 2.98   | 3.32   | 3.58    | 3.58    | 3.75    | 3.75    | 3.83    | 3.83    |
| 1985  | 1,210 | 0.00   | 0.17   | 0.25   | 0.83   | 0.99   | 1.74   | 2.73   | 3.06   | 3.31   | 3.31    | 3.55    | 3.55    | 3.72    | 3.72    | 3.88    |
| 1986  | 1,327 | 0.15   | 0.15   | 0.53   | 0.68   | 1.21   | 2.11   | 2.49   | 2.64   | 2.64   | 2.86    | 2.86    | 3.01    | 3.09    | 3.24    | 3.54    |
| 1987  | 1,324 | 0.00   | 0.15   | 0.38   | 0.83   | 1.74   | 2.27   | 2.42   | 2.49   | 2.64   | 2.64    | 2.79    | 2.87    | 3.02    | 3.17    | 4.00    |
| 1988  | 1,337 | 0.00   | 0.22   | 0.37   | 0.97   | 1.50   | 1.65   | 1.72   | 1.87   | 1.87   | 2.02    | 2.02    | 2.17    | 2.32    | 2.99    | 3.74    |
| 1989  | 1,381 | 0.14   | 0.29   | 0.58   | 1.16   | 1.30   | 1.38   | 1.52   | 1.52   | 1.52   | 1.52    | 1.74    | 1.88    | 2.68    | 3.33    | 3.69    |
| 1990  | 1,425 | 0.14   | 0.35   | 0.77   | 0.98   | 1.05   | 1.19   | 1.19   | 1.19   | 1.26   | 1.54    | 1.89    | 2.60    | 3.16    | 3.51    | 3.58    |
| 1991  | 1,462 | 0.14   | 0.27   | 0.41   | 0.48   | 0.62   | 0.62   | 0.62   | 0.68   | 1.03   | 1.37    | 2.05    | 2.60    | 2.87    | 2.94    | 3.01    |
| 1992  | 1,614 | 0.00   | 0.06   | 0.12   | 0.25   | 0.25   | 0.25   | 0.31   | 0.56   | 0.81   | 1.30    | 1.80    | 2.04    | 2.11    | 2.23    | 2.42    |
| 1993  | 1,766 | 0.00   | 0.06   | 0.17   | 0.17   | 0.23   | 0.40   | 0.74   | 1.08   | 1.64   | 2.27    | 2.49    | 2.49    | 2.60    | 2.72    | 2.77    |
| 1994  | 1,848 | 0.05   | 0.16   | 0.16   | 0.27   | 0.38   | 0.81   | 1.08   | 1.62   | 2.22   | 2.49    | 2.54    | 2.60    | 2.76    | 2.81    | 3.19    |
| 1995  | 2,056 | 0.05   | 0.05   | 0.10   | 0.19   | 0.68   | 0.92   | 1.61   | 2.19   | 2.43   | 2.48    | 2.53    | 2.68    | 2.72    | 3.11    | 3.50    |
| 1996  | 2,255 | 0.00   | 0.04   | 0.09   | 0.49   | 0.80   | 1.51   | 2.04   | 2.26   | 2.35   | 2.39    | 2.53    | 2.53    | 2.93    | 3.41    | 3.46    |
| 1997  | 2,507 | 0.08   | 0.16   | 0.48   | 0.80   | 1.36   | 2.07   | 2.43   | 2.51   | 2.55   | 2.67    | 2.67    | 3.07    | 3.51    | 3.55    | 3.67    |
| 1998  | 2,789 | 0.14   | 0.43   | 0.79   | 1.36   | 2.37   | 2.80   | 2.98   | 3.08   | 3.16   | 3.16    | 3.62    | 4.20    | 4.27    | 4.41    |         |
| 1999  | 2,893 | 0.17   | 0.48   | 0.93   | 1.90   | 2.35   | 2.49   | 2.59   | 2.73   | 2.73   | 3.25    | 3.91    | 3.98    | 4.11    |         |         |
| 2000  | 2,953 | 0.24   | 0.61   | 1.56   | 2.03   | 2.13   | 2.27   | 2.40   | 2.40   | 2.98   | 3.66    | 3.73    | 3.89    |         |         |         |
| 2001  | 3,030 | 0.26   | 1.25   | 1.68   | 1.85   | 2.01   | 2.15   | 2.15   | 2.67   | 3.40   | 3.43    | 3.60    |         |         |         |         |
| 2002  | 3,135 | 0.41   | 0.77   | 0.89   | 1.02   | 1.08   | 1.08   | 1.63   | 2.30   | 2.33   | 2.46    |         |         |         |         |         |
| 2003  | 3,050 | 0.10   | 0.20   | 0.30   | 0.33   | 0.33   | 0.85   | 1.57   | 1.61   | 1.70   |         |         |         |         |         |         |
| 2004  | 3,167 | 0.03   | 0.09   | 0.13   | 0.13   | 0.63   | 1.26   | 1.33   | 1.42   |        |         |         |         |         |         |         |
| 2005  | 3,277 | 0.03   | 0.06   | 0.06   | 0.61   | 1.19   | 1.28   | 1.37   |        |        |         |         |         |         |         |         |
| 2006  | 3,299 | 0.00   | 0.00   | 0.49   | 0.91   | 1.00   | 1.09   |        |        |        |         |         |         |         |         |         |
| 2007  | 3,377 | 0.00   | 0.47   | 0.92   | 1.10   | 1.18   |        |        |        |        |         |         |         |         |         |         |
| 2008  | 3,375 | 0.41   | 0.80   | 0.95   | 1.07   |        |        |        |        |        |         |         |         |         |         |         |
| 2009  | 3,421 | 0.32   | 0.44   | 0.53   |        |        |        |        |        |        |         |         |         |         |         |         |
| 2010  | 3,259 | 0.00   | 0.03   |        |        |        |        |        |        |        |         |         |         |         |         |         |
| 2011  | 3,326 | 0.03   |        |        |        |        |        |        |        |        |         |         |         |         |         |         |
| Summary statistics  |       | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 | Year 7 | Year 8 | Year 9 | Year 10 | Year 11 | Year 12 | Year 13 | Year 14 | Year 15 |
| Marginal average  |       | 0.12   | 0.21   | 0.24   | 0.30   | 0.31   | 0.31   | 0.29   | 0.28   | 0.27   | 0.28    | 0.26    | 0.22    | 0.22    | 0.22    | 0.24    |
| Cumulative average  |       | 0.12   | 0.33   | 0.57   | 0.86   | 1.17   | 1.47   | 1.76   | 2.03   | 2.30   | 2.57    | 2.82    | 3.04    | 3.25    | 3.46    | 3.69    |
| Standard deviation  |       | 0.12   | 0.28   | 0.40   | 0.51   | 0.60   | 0.65   | 0.68   | 0.72   | 0.78   | 0.82    | 0.85    | 0.84    | 0.78    | 0.70    | 0.63    |
| Median  |       | 0.08   | 0.24   | 0.45   | 0.81   | 1.08   | 1.32   | 1.71   | 2.23   | 2.43   | 2.66    | 2.79    | 2.94    | 3.09    | 3.37    | 3.67    |
| Minimum   |       | 0.00   | 0.00   | 0.06   | 0.13   | 0.23   | 0.25   | 0.31   | 0.56   | 0.81   | 1.30    | 1.74    | 1.88    | 2.11    | 2.23    | 2.42    |
| Maximum   |       | 0.41   | 1.25   | 1.68   | 2.03   | 2.37   | 2.80   | 2.98   | 3.08   | 3.59   | 4.12    | 4.39    | 4.67    | 4.67    | 4.85    | 4.85    |

Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

Table 4

| Static Pool Cumulative Global Corporate Default Rates, 1981 to 2012 (%) |         |                  |               |               |               |               |               |               |               |               |                |                |                |                |                |                |
|---|---------|------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Speculative-grade ratings   |         |                  |               |               |               |               |               |               |               |               |                |                |                |                |                |                |
| Year  | Issuers | --Time horizon-- |               |               |               |               |               |               |               |               |                |                |                |                |                |                |
|   |         | Year 1           | Year 2        | Year 3        | Year 4        | Year 5        | Year 6        | Year 7        | Year 8        | Year 9        | Year 10        | Year 11        | Year 12        | Year 13        | Year 14        | Year 15        |
| 1981  | 321     | 0.62             | 4.67          | 7.79          | 10.90         | 13.08         | 17.76         | 18.69         | 19.63         | 21.50         | 23.68          | 27.41          | 28.66          | 30.22          | 30.53          | 30.84          |
| 1982  | 340     | 4.41             | 7.06          | 10.29         | 12.65         | 17.06         | 17.65         | 18.53         | 20.00         | 22.06         | 26.18          | 27.35          | 28.82          | 29.12          | 29.41          | 29.41          |
| 1983  | 341     | 2.93             | 5.57          | 8.80          | 14.08         | 15.25         | 17.89         | 19.65         | 21.70         | 26.69         | 27.86          | 29.33          | 29.62          | 29.91          | 29.91          | 30.21          |
| 1984  | 368     | 3.26             | 7.34          | 13.86         | 15.22         | 18.21         | 20.65         | 23.37         | 27.45         | 28.80         | 30.43          | 30.71          | 30.98          | 30.98          | 31.25          | 31.25          |
| 1985  | 418     | 4.31             | 11.24         | 13.16         | 16.75         | 19.62         | 22.49         | 26.79         | 27.99         | 29.19         | 29.43          | 29.90          | 29.90          | 29.90          | 29.90          | 30.62          |
| 1986  | 530     | 5.66             | 7.74          | 11.32         | 13.96         | 17.55         | 21.89         | 23.21         | 24.72         | 25.28         | 25.66          | 26.04          | 26.42          | 26.60          | 27.17          | 27.92          |
| 1987  | 681     | 2.79             | 6.75          | 10.57         | 15.12         | 20.85         | 23.05         | 24.96         | 25.55         | 26.28         | 26.73          | 27.02          | 27.17          | 27.75          | 28.93          | 30.40          |
| 1988  | 756     | 3.84             | 7.94          | 13.62         | 21.03         | 23.15         | 25.00         | 25.53         | 26.59         | 26.98         | 27.51          | 28.04          | 28.70          | 30.42          | 31.88          | 33.20          |
| 1989  | 751     | 4.66             | 11.72         | 21.17         | 23.44         | 25.43         | 26.23         | 27.16         | 27.56         | 28.36         | 29.43          | 29.96          | 31.56          | 32.89          | 34.22          | 34.89          |
| 1990  | 692     | 8.09             | 18.06         | 21.53         | 23.55         | 24.42         | 25.58         | 25.87         | 27.02         | 28.32         | 28.90          | 30.64          | 32.23          | 34.10          | 34.97          | 35.26          |
| 1991  | 589     | 11.04            | 15.96         | 17.49         | 18.51         | 20.03         | 20.37         | 21.56         | 22.92         | 23.43         | 24.96          | 26.83          | 29.20          | 30.22          | 30.73          | 31.07          |
| 1992  | 526     | 6.08             | 7.98          | 9.13          | 11.22         | 11.79         | 13.12         | 14.64         | 15.21         | 17.30         | 19.77          | 22.62          | 23.57          | 24.14          | 24.33          | 24.33          |
| 1993  | 561     | 2.50             | 4.28          | 7.66          | 8.56          | 9.98          | 11.23         | 11.94         | 14.08         | 16.76         | 19.43          | 20.50          | 21.21          | 21.57          | 22.10          | 22.46          |
| 1994  | 713     | 2.10             | 5.89          | 7.29          | 8.70          | 10.10         | 12.06         | 15.01         | 18.23         | 20.90         | 22.02          | 22.72          | 23.14          | 23.70          | 23.98          | 25.11          |
| 1995  | 824     | 3.52             | 5.22          | 6.80          | 8.50          | 10.68         | 13.59         | 18.20         | 21.48         | 22.94         | 23.67          | 24.27          | 24.76          | 25.00          | 25.85          | 27.91          |
| 1996  | 887     | 1.80             | 3.72          | 6.20          | 9.24          | 12.06         | 16.35         | 20.29         | 22.10         | 22.89         | 23.56          | 24.01          | 24.46          | 25.37          | 27.17          | 27.62          |
| 1997  | 1,000   | 2.00             | 5.20          | 9.00          | 13.10         | 18.40         | 22.70         | 25.00         | 25.80         | 26.50         | 27.20          | 27.70          | 28.80          | 30.70          | 30.90          | 31.00          |
| 1998  | 1,315   | 3.65             | 9.13          | 14.52         | 21.52         | 26.24         | 29.13         | 30.27         | 31.03         | 31.86         | 32.32          | 33.31          | 35.06          | 35.21          | 35.29          |                |
| 1999  | 1,659   | 5.55             | 11.87         | 20.25         | 26.40         | 29.66         | 30.92         | 31.71         | 32.43         | 32.85         | 34.12          | 36.17          | 36.53          | 36.65          |                |                |
| 2000  | 1,770   | 6.16             | 15.08         | 21.81         | 25.48         | 27.18         | 28.14         | 28.87         | 29.44         | 30.79         | 33.39          | 33.73          | 33.90          |                |                |                |
| 2001  | 1,773   | 9.76             | 17.60         | 22.11         | 23.75         | 24.87         | 25.61         | 26.17         | 27.58         | 30.34         | 30.80          | 30.96          |                |                |                |                |
| 2002  | 1,695   | 9.32             | 14.40         | 16.40         | 17.46         | 18.35         | 18.94         | 20.59         | 23.89         | 24.42         | 24.66          |                |                |                |                |                |
| 2003  | 1,787   | 4.98             | 6.99          | 8.11          | 9.12          | 9.68          | 11.42         | 15.05         | 15.72         | 16.00         |                |                |                |                |                |                |
| 2004  | 1,905   | 2.05             | 3.31          | 4.30          | 4.93          | 6.82          | 10.97         | 11.76         | 12.18         |               |                |                |                |                |                |                |
| 2005  | 2,085   | 1.44             | 2.40          | 3.26          | 5.52          | 10.36         | 11.46         | 12.09         |               |               |                |                |                |                |                |                |
| 2006  | 2,222   | 1.13             | 2.12          | 5.00          | 10.94         | 12.29         | 13.19         |               |               |               |                |                |                |                |                |                |
| 2007  | 2,351   | 0.89             | 4.17          | 11.31         | 13.10         | 14.08         |               |               |               |               |                |                |                |                |                |                |
| 2008  | 2,463   | 3.57             | 11.86         | 14.05         | 14.94         |               |               |               |               |               |                |                |                |                |                |                |
| 2009  | 2,337   | 9.58             | 12.11         | 13.14         |               |               |               |               |               |               |                |                |                |                |                |                |
| 2010  | 2,223   | 2.83             | 4.41          |               |               |               |               |               |               |               |                |                |                |                |                |                |
| 2011  | 2,500   | 1.72             |               |               |               |               |               |               |               |               |                |                |                |                |                |                |
| <b>Summary statistics</b>   |         | <b>Year 1</b>    | <b>Year 2</b> | <b>Year 3</b> | <b>Year 4</b> | <b>Year 5</b> | <b>Year 6</b> | <b>Year 7</b> | <b>Year 8</b> | <b>Year 9</b> | <b>Year 10</b> | <b>Year 11</b> | <b>Year 12</b> | <b>Year 13</b> | <b>Year 14</b> | <b>Year 15</b> |
| Marginal average  |         | 4.22             | 4.20          | 3.82          | 3.20          | 2.65          | 2.28          | 1.96          | 1.72          | 1.60          | 1.49           | 1.29           | 1.11           | 1.02           | 0.92           | 0.96           |
| Cumulative average  |         | 4.22             | 8.24          | 11.75         | 14.57         | 16.84         | 18.74         | 20.33         | 21.69         | 22.95         | 24.10          | 25.08          | 25.91          | 26.67          | 27.35          | 28.04          |
| Standard deviation  |         | 2.81             | 4.56          | 5.55          | 6.10          | 6.35          | 6.16          | 5.85          | 5.45          | 4.73          | 4.04           | 3.94           | 4.05           | 4.04           | 3.72           | 3.46           |

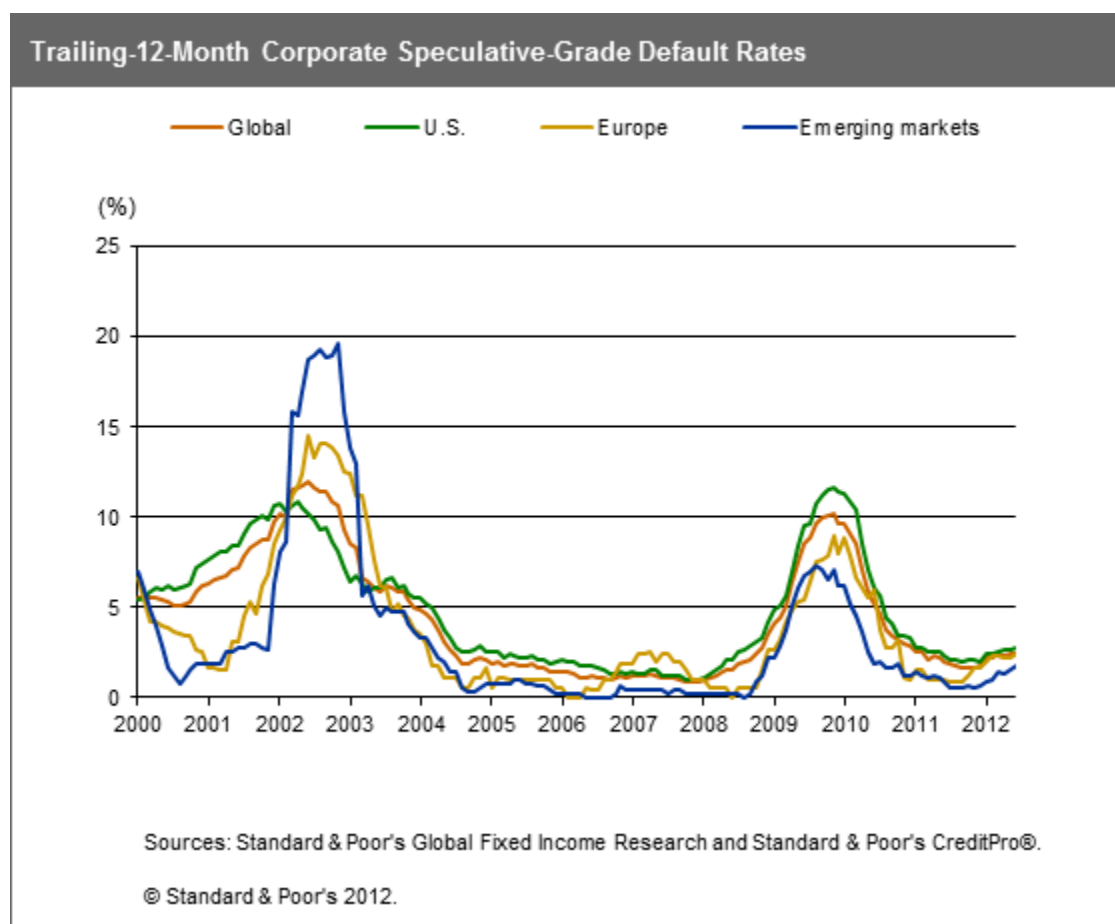
**Table 4**

| Static Pool Cumulative Global Corporate Default Rates, 1981 to 2012 (%) (cont.) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Median  | 3.57  | 7.20  | 11.31 | 14.02 | 17.55 | 19.66 | 21.56 | 24.31 | 26.28 | 26.96 | 27.70 | 28.81 | 29.91 | 29.91 | 30.40 |
| Minimum   | 0.62  | 2.12  | 3.26  | 4.93  | 6.82  | 10.97 | 11.76 | 12.18 | 16.00 | 19.43 | 20.50 | 21.21 | 21.57 | 22.10 | 22.46 |
| Maximum   | 11.04 | 18.06 | 22.11 | 26.40 | 29.66 | 30.92 | 31.71 | 32.43 | 32.85 | 34.12 | 36.17 | 36.53 | 36.65 | 35.29 | 35.26 |

Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

We continue to observe that default rates for all rating categories rise and fall as the economy moves through periods of expansion and contraction. Moreover, economic cycles generally do not produce the same degree of stress in all sectors and regions. For example, the speculative-grade default rate has changed dynamically over the past 31 years, both globally and across different regions (see chart 2). Even though the ebb and flow in the default cycle is more or less synchronized by region, the peaks (and troughs) experienced in each region are considerably different. Therefore, we do not expect that economic stress will affect all regions equally. Differences in default rates across regions can stem from a variety of factors, including (but not limited to) variation in ratings coverage, limited sample size, asymmetric depth of leveraged finance markets, and divergences in terms of bankruptcy regimes. Only over the very long term (multiple economic cycles) would we expect to be able to observe whether similarly rated issuers from different regions actually experience similar long-term default frequencies.

**Chart 2**



Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

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## Default Rate Variation By Sector

Likewise, we find differences when default rates are segmented by industrial sector, both at a granular level as well as in aggregate (financials versus nonfinancials) (see table 5). At a more granular level, variations by sector appear more extreme, though small sample sizes sometimes affect measurements of actual default frequencies. In addition, comparisons of default rates between subsectors with few issuers can be distorted by small sample sizes and by idiosyncratic factors.

**Table 5**

| Descriptive Statistics For U.S. Industry-Level Default Rates: Trailing-12-Months* (%) |       |          |       |      |        |        |             |           |         |       |         |       |         |
|---|-------|----------|-------|------|--------|--------|-------------|-----------|---------|-------|---------|-------|---------|
|   | AACGM | Consumer | E&NR  | FI   | F&BP/H | Health | High<br>tec | Insurance | Leisure | RE    | Telecom | Trans | Utility |
| Average   | 2.56  | 2.71     | 2.17  | 0.90 | 2.93   | 1.55   | 1.50        | 0.68      | 3.41    | 1.24  | 2.26    | 2.64  | 0.29    |
| Median  | 1.71  | 2.31     | 1.33  | 0.42 | 1.39   | 0.98   | 1.10        | 0.32      | 2.18    | 0.00  | 0.82    | 2.00  | 0.00    |
| Standard deviation  | 2.51  | 1.85     | 2.45  | 1.03 | 4.11   | 1.59   | 1.82        | 1.01      | 3.74    | 2.50  | 4.12    | 2.53  | 0.49    |
| Minimum   | 0.00  | 0.00     | 0.00  | 0.00 | 0.00   | 0.00   | 0.00        | 0.00      | 0.00    | 0.00  | 0.00    | 0.00  | 0.00    |
| Maximum   | 11.68 | 8.21     | 11.21 | 4.19 | 23.23  | 6.34   | 6.77        | 5.56      | 20.00   | 13.33 | 18.10   | 11.36 | 2.17    |
| Weighted average  | 2.78  | 2.83     | 2.10  | 0.95 | 3.03   | 1.77   | 1.46        | 0.50      | 3.83    | 0.83  | 2.76    | 2.53  | 0.31    |

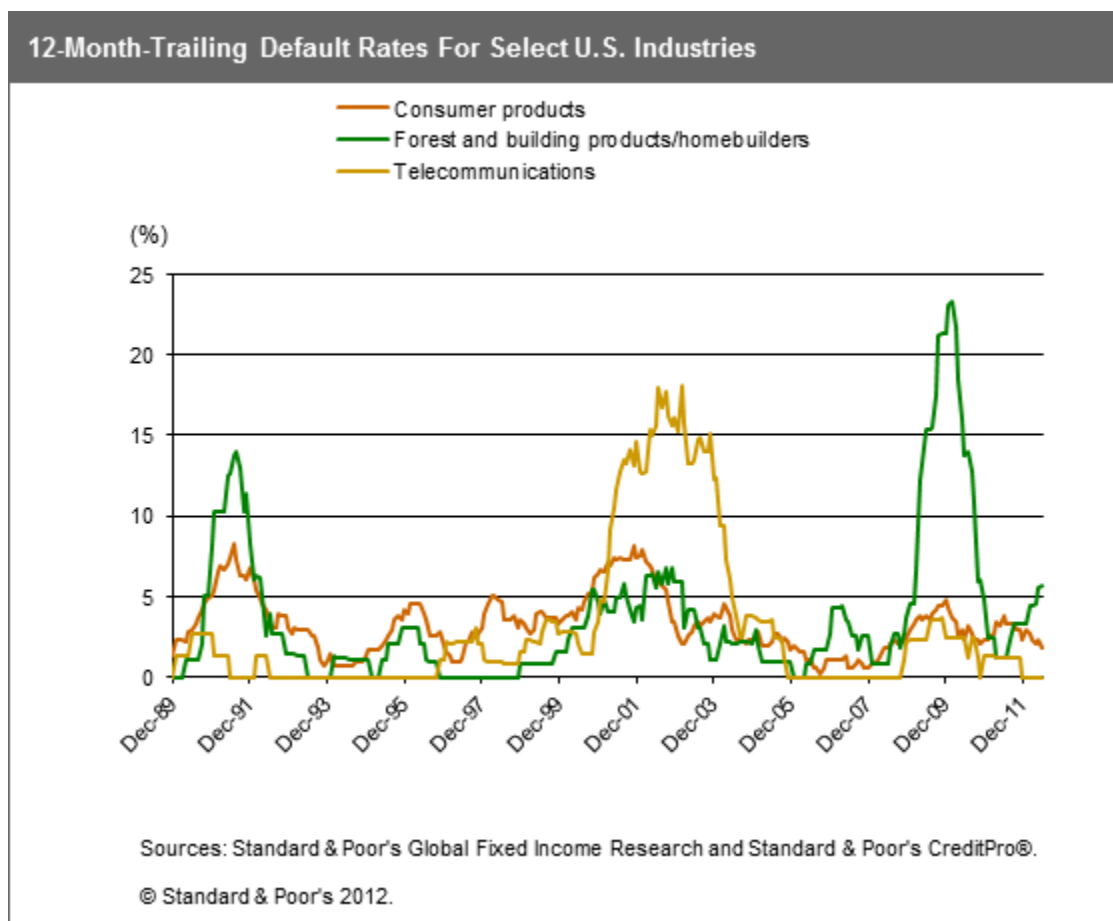
\*The 12-month period ending June 30, 2012. AACGM--Aerospace/automotive/capital goods/metal. Consumer--Consumer/service sector. E&NR--Energy and natural resources. FI--Financial institutions. F&BP/H--Forest and building products/homebuilders. Health--Health care/chemicals. High Tech--High tech/computers/office equipment. Leisure--Leisure time/media. RE--Real estate. Telecom--Telecommunications. Trans--Transportation. Includes investment-grade and speculative-grade entities. Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

In each cycle, variations in default rates across sectors are unique both in magnitude and duration. In order to compare default exposures across various industrial sectors and to limit broad economic cycle influences globally, we limit our analysis to experiences within the U.S. Broad credit profiles across various industries show considerable variation. The combined effect of factors such as strategic development, leverage composition, management vision, sector composition/competition or government support/regulation set against economic, and credit movements can vary across sectors in terms of default exposure.

For example, the default rate for the telecommunications sector was at negligible levels before the turn of the century, in large part because the sector had very little representation in the rated universe of entities before the industry's expansion in the late 1990s. Following the industry's comparably quick growth and the subsequent shocks in the early 2000s, the sector's default rate rose to a peak of 18.1% in February 2003 (see chart 3). After staying elevated through early 2004, the sector's 12-month trailing default rate fell and has remained low since then. In contrast, the default rate for the forest and building products/homebuilders sector experienced sharp increases during the 1990-1991 downturn before reaching an all-time high of 23.2% in February 2010, during the most recent recession. In the 2000-2001 cycle, the telecommunication sector hit a peak default rate, but the forest and building products/homebuilders sector experienced only a modest increase in its default rate. Similar to these two sectors, the default rate for the consumer products sector increased in all three previously mentioned downturns, though at much lower levels (see chart 3). The consumer products sector has never experienced a period of increased defaults at the magnitude the

telecommunications or forest and building products/homebuilders sectors have seen. These three industries represent some of the various experiences that individual sectors can undergo over time.

**Chart 3**



Although these examples are useful illustrative examples of potential outcomes, they presents only a fraction of the rated universe in the U.S. and a sample of the industries covered (see table 5 for descriptive statistics of the 12-month trailing default rates for the 13 industrial sectors). Therefore, we believe that it is important to note the considerable variations that are apparent when comparing the sectors' maximum default rates and standard deviations, considering the nature of each economic cycle.

## Diversification Is Not Foolproof

The concept of diversification has long been a staple of a prudent investment strategy. In order to reduce or mitigate risk, investors are advised to invest across a range of countries, asset classes, or industries. With this in mind, we examined the correlations of default rates across industries within the U.S. (see table 6). Long-term data (1981 through June 2012) have shown that there are indeed instances of heightened correlation between sectors, with highs of 0.85 between the forest and building products/homebuilders and leisure time/media sectors, and highs of 0.81 of between

real estate and financial institutions sectors. Of a total of 78 possible correlation combinations, 20 were at or above 0.5.

However, it became painfully clear during the most recent recession that systemic risk raises the pairwise correlations between otherwise weakly correlated industries as the negative effects of slowed economic growth and a lack of funding permeate the broad economy, particularly in the U.S. We examined the correlation coefficients across industries in the U.S. from Aug. 31, 2008, through June 30, 2012 (see the bottom half of table 6), and noted that during this approximately four-year period, the pairwise correlations between sectors saw nearly ubiquitous increases to extreme levels, in our opinion, with 12 correlation points at or above 0.90. As we'd previously mentioned, 20 of 78 possible correlation combinations reached at least 0.50 during the past 31 years, but since Aug. 31, 2008, 48 correlation combinations are above 0.5. Only the utility sector passed this period without a default

**Table 6**

**U.S. Industry-Level Correlations: Long-Term Versus Aug. 2008-Forward**

**Correlation coefficients between U.S. industry-level default rates, trailing-12-month averages, and 1981-June 2012 data**

|           | AACGM   | Consumer | E&NR    | FI    | F&BP/H | Health  | High tech | Insurance | Leisure | RE      | Telecom | Trans | Utility |
|-----------|---------|----------|---------|-------|--------|---------|-----------|-----------|---------|---------|---------|-------|---------|
| AACGM     | 1       |          |         |       |        |         |           |           |         |         |         |       |         |
| Consumer  | 0.536   | 1        |         |       |        |         |           |           |         |         |         |       |         |
| E&NR      | 0.210   | (0.144)  | 1       |       |        |         |           |           |         |         |         |       |         |
| FI        | 0.302   | 0.363    | (0.122) | 1     |        |         |           |           |         |         |         |       |         |
| F&BP/H    | 0.612   | 0.470    | 0.108   | 0.526 | 1      |         |           |           |         |         |         |       |         |
| Health    | 0.699   | 0.562    | 0.259   | 0.347 | 0.472  | 1       |           |           |         |         |         |       |         |
| High Tech | 0.454   | 0.463    | 0.214   | 0.161 | 0.136  | 0.366   | 1         |           |         |         |         |       |         |
| Insurance | (0.052) | 0.028    | 0.118   | 0.018 | 0.061  | (0.018) | 0.082     | 1         |         |         |         |       |         |
| Leisure   | 0.558   | 0.503    | 0.069   | 0.719 | 0.853  | 0.539   | 0.210     | 0.044     | 1       |         |         |       |         |
| RE        | 0.164   | 0.214    | (0.046) | 0.814 | 0.420  | 0.127   | 0.168     | 0.064     | 0.600   | 1       |         |       |         |
| Telecom   | 0.712   | 0.504    | (0.024) | 0.043 | 0.203  | 0.463   | 0.441     | (0.106)   | 0.146   | (0.133) | 1       |       |         |
| Trans     | 0.557   | 0.502    | 0.012   | 0.237 | 0.611  | 0.399   | 0.303     | 0.085     | 0.508   | 0.115   | 0.520   | 1     |         |
| Utility   | 0.344   | 0.370    | (0.037) | 0.148 | 0.085  | 0.276   | 0.239     | (0.007)   | 0.003   | 0.154   | 0.585   | 0.293 | 1       |

**Correlation coefficients between U.S. industry-level default rates, trailing-12-month averages, and Aug. 2008-June 2012 data**

|           | AACGM | Consumer | E&NR  | FI    | F&BP/H | Health | High tech | Insurance | Leisure | RE    | Telecom | Trans | Utility |
|-----------|-------|----------|-------|-------|--------|--------|-----------|-----------|---------|-------|---------|-------|---------|
| AACGM     | 1     |          |       |       |        |        |           |           |         |       |         |       |         |
| Consumer  | 0.697 | 1        |       |       |        |        |           |           |         |       |         |       |         |
| E&NR      | 0.933 | 0.658    | 1     |       |        |        |           |           |         |       |         |       |         |
| FI        | 0.617 | 0.443    | 0.535 | 1     |        |        |           |           |         |       |         |       |         |
| F&BP/H    | 0.924 | 0.617    | 0.960 | 0.528 | 1      |        |           |           |         |       |         |       |         |
| Health    | 0.896 | 0.641    | 0.811 | 0.867 | 0.794  | 1      |           |           |         |       |         |       |         |
| High Tech | 0.867 | 0.808    | 0.851 | 0.721 | 0.817  | 0.901  | 1         |           |         |       |         |       |         |
| Insurance | 0.301 | 0.404    | 0.286 | 0.600 | 0.213  | 0.540  | 0.575     | 1         |         |       |         |       |         |
| Leisure   | 0.955 | 0.708    | 0.945 | 0.729 | 0.934  | 0.934  | 0.928     | 0.413     | 1       |       |         |       |         |
| RE        | 0.819 | 0.618    | 0.721 | 0.919 | 0.710  | 0.969  | 0.863     | 0.553     | 0.883   | 1     |         |       |         |
| Telecom   | 0.780 | 0.704    | 0.756 | 0.649 | 0.736  | 0.770  | 0.794     | 0.364     | 0.819   | 0.727 | 1       |       |         |
| Trans     | 0.347 | 0.078    | 0.437 | 0.069 | 0.485  | 0.231  | 0.287     | 0.285     | 0.310   | 0.136 | 0.042   | 1     |         |

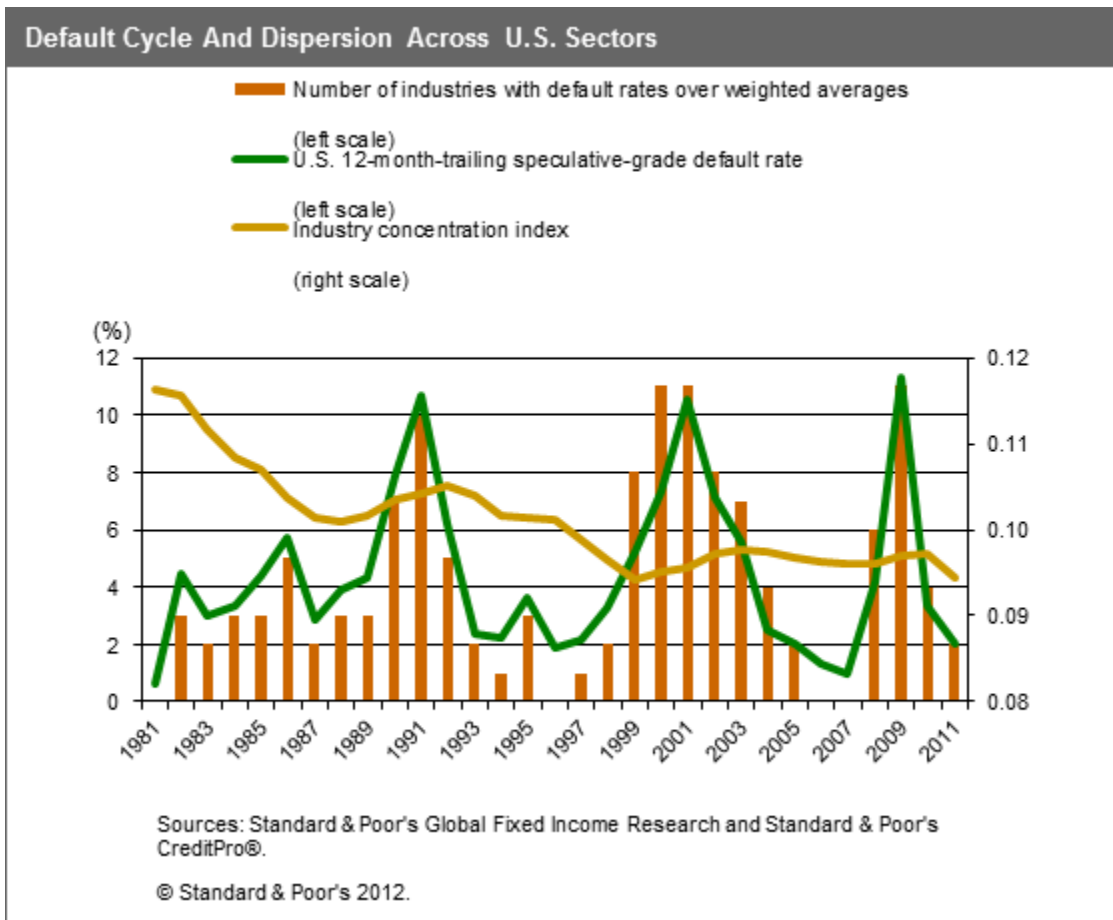
**Table 6**

| U.S. Industry-Level Correlations: Long-Term Versus Aug. 2008-Forward (cont.) |     |     |     |     |     |     |     |     |     |     |     |   |
|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| Utility  | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 1 |

AACGM--Aerospace/automotive/capital goods/metal. Consumer--Consumer/service sector. E&NR--Energy and natural resources. FI--Financial institutions. F&BP/H--Forest and building products/homebuilders. Health--Health care/chemicals. High tech--High tech/computers/office equipment. Leisure--Leisure time/media. RE--Real estate. Telecom--Telecommunications. Trans--Transportation. N/A--Not applicable. Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

In times of increased economic stress, not only do individual sectors experience increases in their default patterns relative to each other, but most sectors also experience heightened default rates relative to their own histories (though not uniformly). In the U.S., during the three major peaks in the speculative-grade default rate, the vast majority of sectors produced default rates that were higher than their long-term weighted averages (see chart 4). Conversely, during periods where the default rate was historically lower, fewer industries exceeded their long-term averages. Interestingly, historical data seem to show that when the speculative-grade default rate is at about 2%, none of sectors' default rates exceed their long-term averages. In addition, the data in chart 4 include the relative concentration of ratings across the various sectors. This reflects the relative evolution of the overall ratings mix, based on sector concentration and representation in the U.S. over time. We calculated this data in the same manner as the Herfindahl Index, in which the concentration index is the sum of the squared weights of each sector at a given point in time. Our results show that the ratings mix in the U.S. was not only broadly dispersed historically, but also that it has become more so: the ratio fell to 0.09 in 2011 from 0.12 in 1981.

Chart 4



Despite relative equanimity between sectors in terms of industry contributions the issuer base at any given time, the relative composition of ratings profiles have changed dramatically for most industries over the past 31 years (see the top half of table 7). The growing ranks of speculative-grade market that can be traced back to the late 1980s in the U.S. have driven most sectors' ratings profiles solidly into the speculative-grade segment since then. The insurance sector was the only sector that saw a relative decline in its proportion of speculative-grade issuers. Meanwhile the telecommunications sector experienced the largest increase over the same time period, which is not surprising given that it was nascent before the turn of the century.

The shift towards a more risky credit profile, as seen across industries, appears to be the result of both negative ratings migrations (in the form of either one-time or progressive downgrades) as well as an increasing number of issuers entering the corporate credit markets with speculative-grade ratings (see the bottom half of table 7). In this case, the shift in the proportions over time are even more profound, with many sectors seeing more than 70% of their new issuers rated speculative grade so far in 2012.

**Table 7**

**The Changing Composition of Global Sectors**

| <b>% of speculative-grade outstanding at start of year*</b> |             |             |             |              |                               |
|---|-------------|-------------|-------------|--------------|-------------------------------|
| <b>Sector</b>   | <b>1982</b> | <b>1992</b> | <b>2002</b> | <b>2012§</b> | <b>Difference (2012-1982)</b> |
| AACGM   | 33.2        | 39.4        | 56.8        | 58.8         | 25.6                          |
| Consumer  | 29.9        | 38.2        | 48.2        | 63.5         | 33.6                          |
| E&NR  | 32.8        | 27.1        | 39.6        | 59.7         | 26.9                          |
| F&BP/H  | 25.7        | 40.0        | 55.6        | 75.6         | 50.0                          |
| FI  | 9.9         | 14.4        | 22.0        | 30.1         | 20.2                          |
| Health  | 24.4        | 33.9        | 54.6        | 67.8         | 43.4                          |
| High tech   | 46.4        | 59.2        | 55.5        | 69.3         | 22.9                          |
| Insurance   | 22.6        | 5.9         | 4.8         | 10.9         | (11.7)                        |
| Leisure   | 41.7        | 65.7        | 70.1        | 81.7         | 40.1                          |
| RE  | 41.7        | 22.2        | 17.2        | 47.8         | 6.2                           |
| Telecom   | 2.8         | 2.4         | 58.6        | 63.3         | 60.6                          |
| Trans   | 26.8        | 27.2        | 36.7        | 50.2         | 23.4                          |
| Utility   | 3.6         | 3.6         | 13.2        | 17.0         | 13.4                          |

| <b>% of speculative-grade new issuers by year†</b> |             |             |             |              |                               |
|--|-------------|-------------|-------------|--------------|-------------------------------|
| <b>Sector</b>                                      | <b>1982</b> | <b>1992</b> | <b>2002</b> | <b>2012§</b> | <b>Difference (2012-1982)</b> |
| AACGM  | 33.3        | 63.2        | 69.6        | 85.7         | 52.4                          |
| Cons   | 50.0        | 75.0        | 73.8        | 90.4         | 40.4                          |
| E&NR   | 25.0        | 38.9        | 69.7        | 82.4         | 57.4                          |
| F&BP/H   | 0.0         | 14.3        | 54.7        | 57.5         | 57.5                          |
| FI   | 0.0         | 72.7        | 83.3        | 92.3         | 92.3                          |
| Health   | 50.0        | 70.8        | 69.0        | 96.6         | 46.6                          |
| High tech  | 85.7        | 40.0        | 84.6        | 94.7         | 9.0                           |
| Insurance  | 22.2        | 10.2        | 15.9        | 50.0         | 27.8                          |
| Leisure  | 54.5        | 75.9        | 90.0        | 91.3         | 36.8                          |
| RE   | 0.0         | 25.0        | 39.1        | 66.7         | 66.7                          |
| Telecom  | -           | 83.3        | 80.8        | 92.3         | -                             |
| Trans  | 0.0         | 0.0         | 50.0        | 60.0         | 60.0                          |
| Utility  | 0.0         | 17.9        | 21.6        | 38.1         | 38.1                          |

\*In the top half of the table, the left-hand column shows the proportion of each sector that started 1982 as speculative grade, and the right-most column shows the difference between the proportion of speculative-grade issuers Jan. 1, 1982, and the start of July 2012. §As of July 2012. †The bottom half of the table shows the proportion of issuers in each sector receiving initial ratings that are speculative grade. AACGM--Aerospace/automotive/capital goods/metal. Consumer--Consumer/service sector. E&NR--Energy and natural resources. FI--Financial institutions. F&BP/H--Forest and building products/homebuilders. Health--Health care/chemicals. High tech--High tech/computers/office equipment. Leisure--Leisure time/media. RE--Real estate. Telecom--Telecommunications. Trans--Transportation. Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.

Yet despite this broad increase in speculative-grade issuers, its effect on most industries' default rates has been muted over the past year relative to the long-term trend (see charts 5 and 6). Although it seems to run counter to intuition, most sectors had low default rates in 2011--despite having a high proportion of speculative-grade ratings--and three sectors recording default rates of zero (see chart 5).

This contrasts sharply with the results seen over the past 31 years (see chart 6). In the long term, the relationship between default rates and the proportion of speculative-grade ratings is stronger than in 2011, evidenced by the decreased slope of the trend line in chart 5. We don't believe this implies that speculative-grade companies have become less likely to default in recent years. A more likely explanation for those companies' relatively elevated rate of survival in the past few years is a combination of factors, including record-low borrowing costs (which makes debt refinancing easier) and the fact that some of these speculative-grade ratings resulted from investment-grade rated companies experiencing broad downgrades in the last cycle due to economic factors and the more stringent criteria changes Standard & Poor's enacted by recent years

**Chart 5**

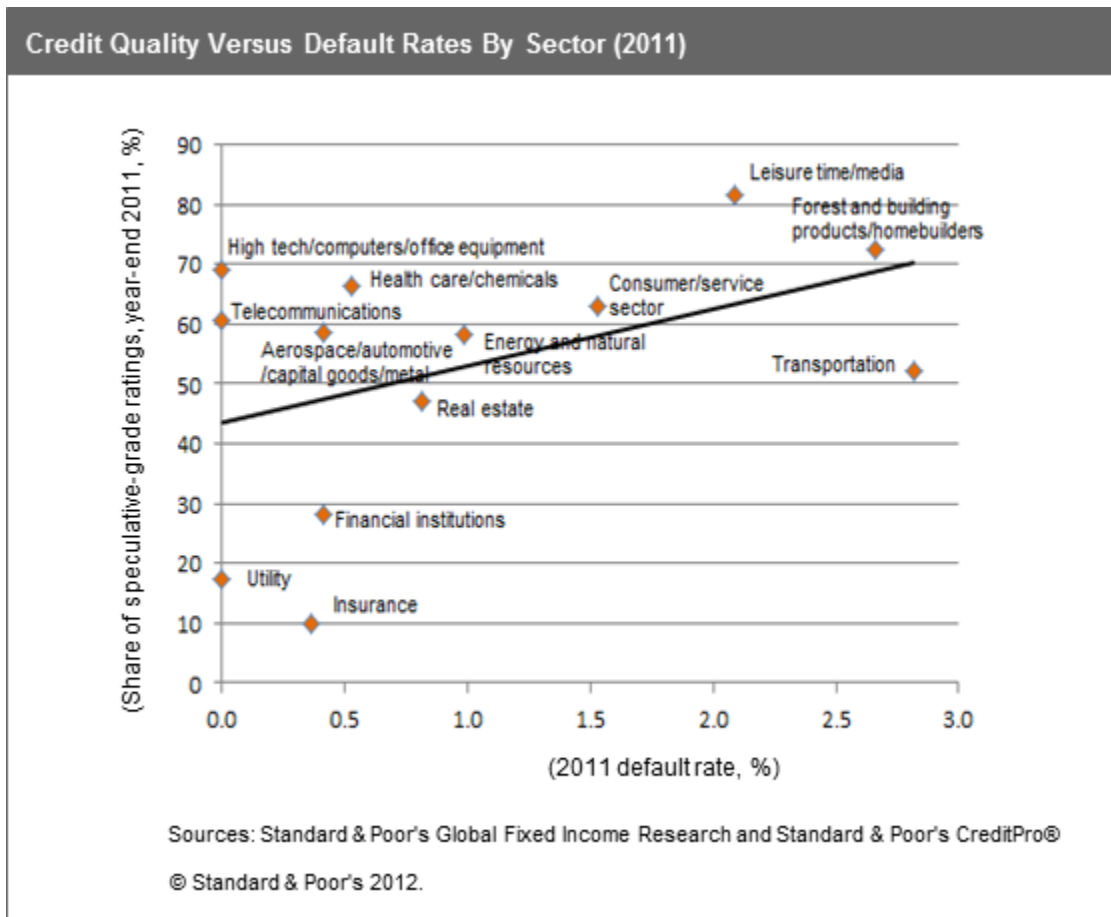
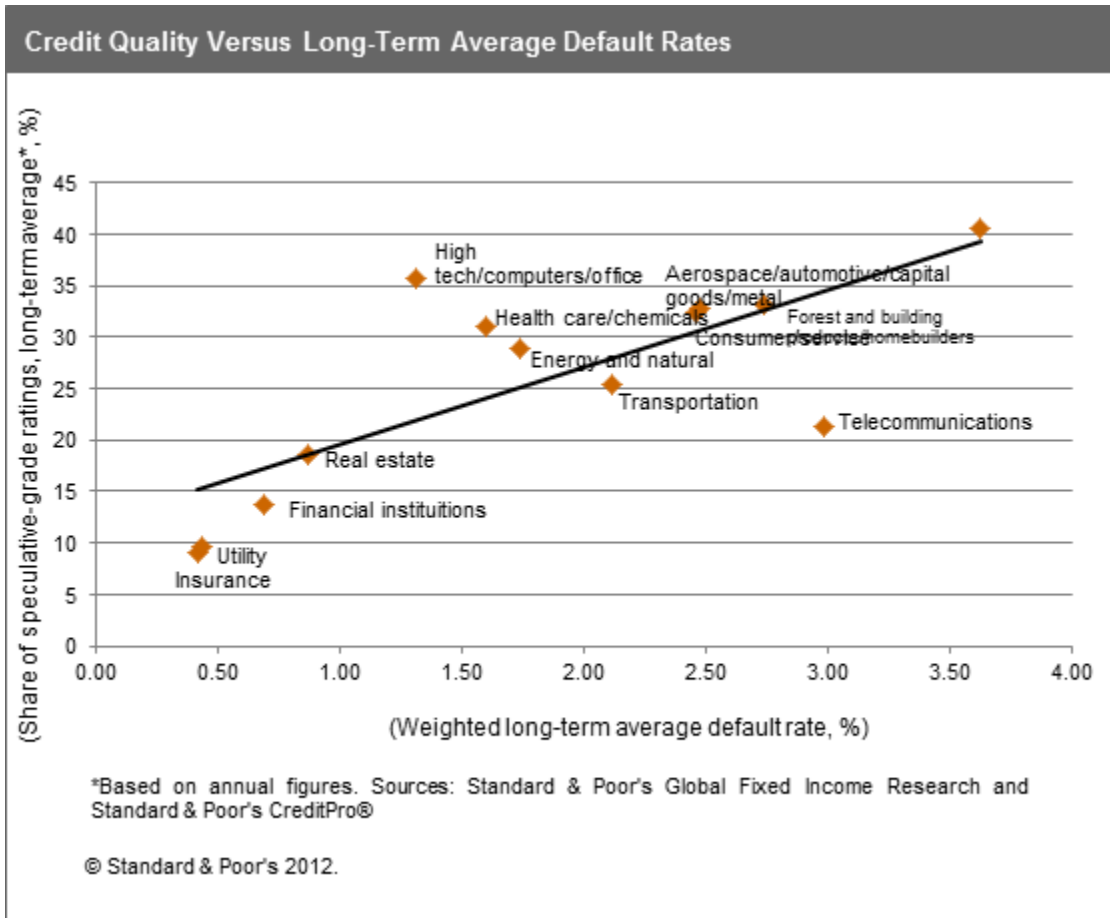


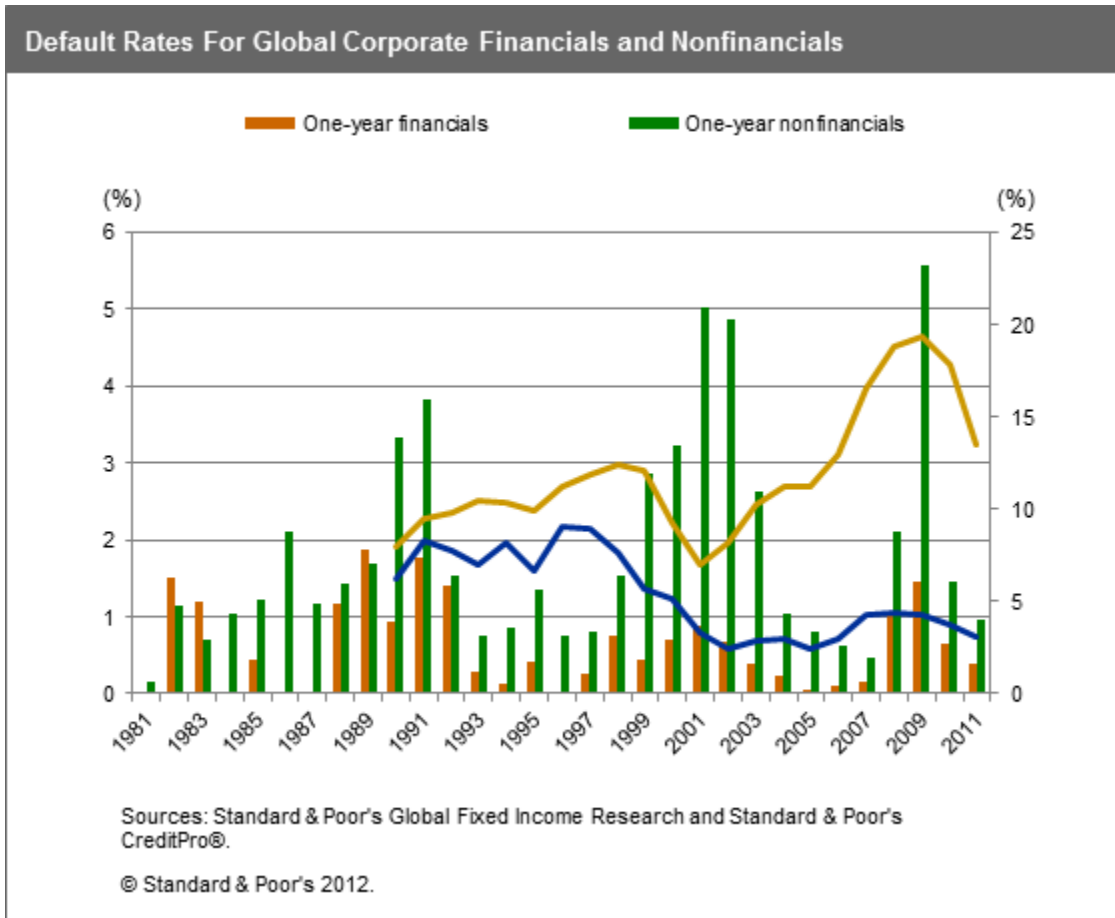
Chart 6



Variations in default frequencies between sectors appear to persist in the long term (see chart 7 for the one- and 10-year cumulative default rates for financials and nonfinancials globally). The yawning gap between the 10-year default rates for nonfinancials and financials attests that nonfinancials have been more prone to default risk during previous periods of turbulence, as documented in Standard & Poor's CreditPro database. Indeed, the distribution of annual defaults shows that the one-year default rates for financials exceeded the nonfinancials' in only three (1982, 1983, and 1989) of the previous 31 years (see chart 6). Of these, it is likely that the data for 1989 partly reflected the U.S. savings and loan crisis, during which hundreds of savings and loan associations (or thrifts) failed--most of which were unrated.



**Chart 7**



Our analysis of ratings path before default reveals that sudden or extreme defaults have been more prevalent among financials (financial institutions and insurance companies) historically because these companies are generally more sensitive to sudden losses in investor confidence. Defaulters among these companies tend to reach default faster than their higher-rated counterparts in industrial sectors (chart 9). Among nonfinancial defaulters, the path to default in the seven years before the default is typically much more subdued (see chart 8). Despite these differing paths to default, financials comprise only 11% of all defaulters over the course of the 31-year time period, but a larger 27% of all companies included in the CreditPro® database used in this analysis.

Chart 8

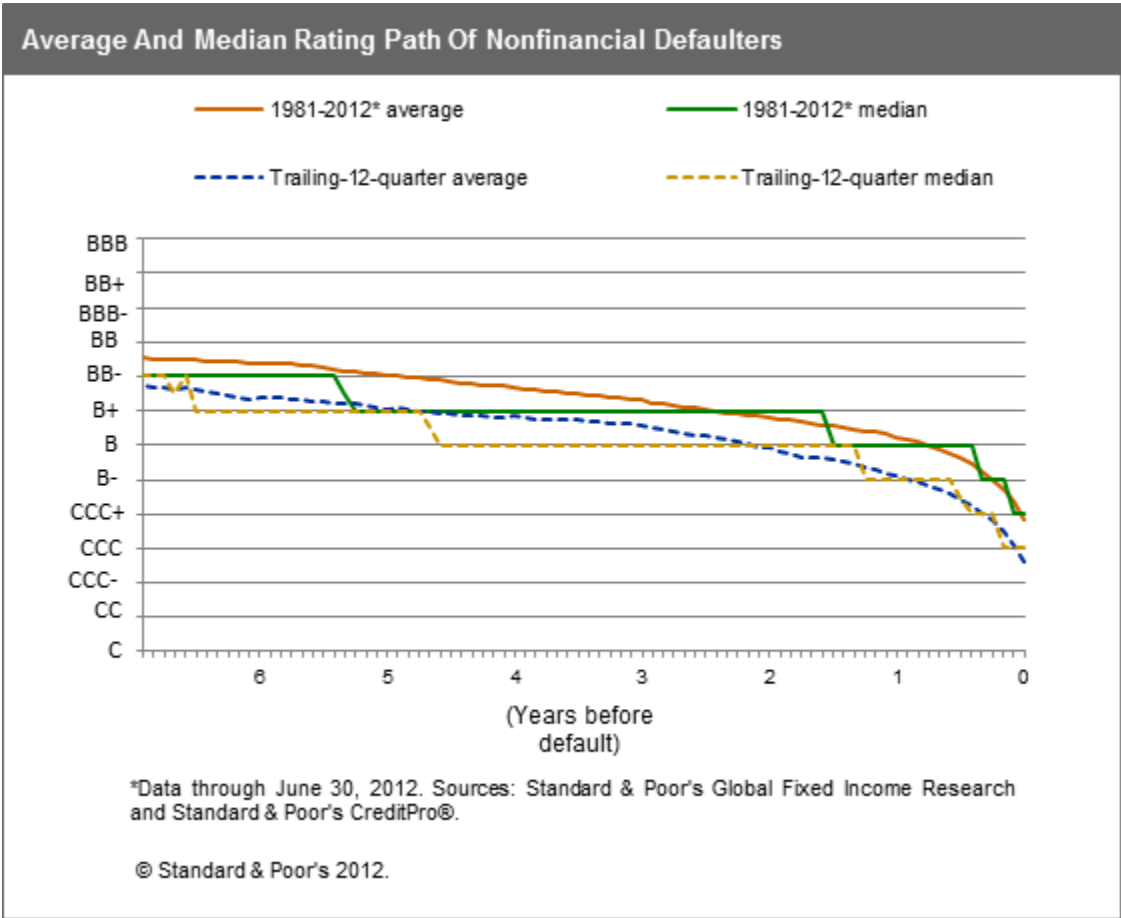
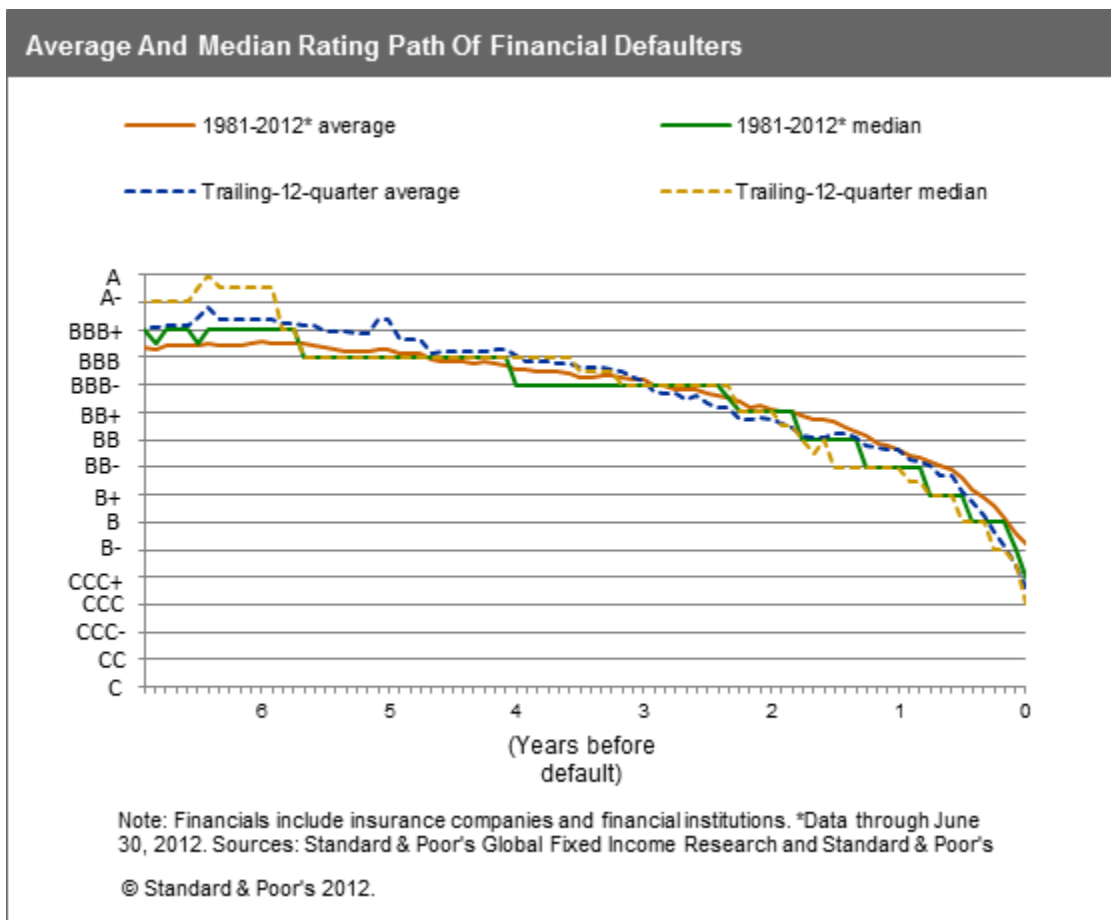


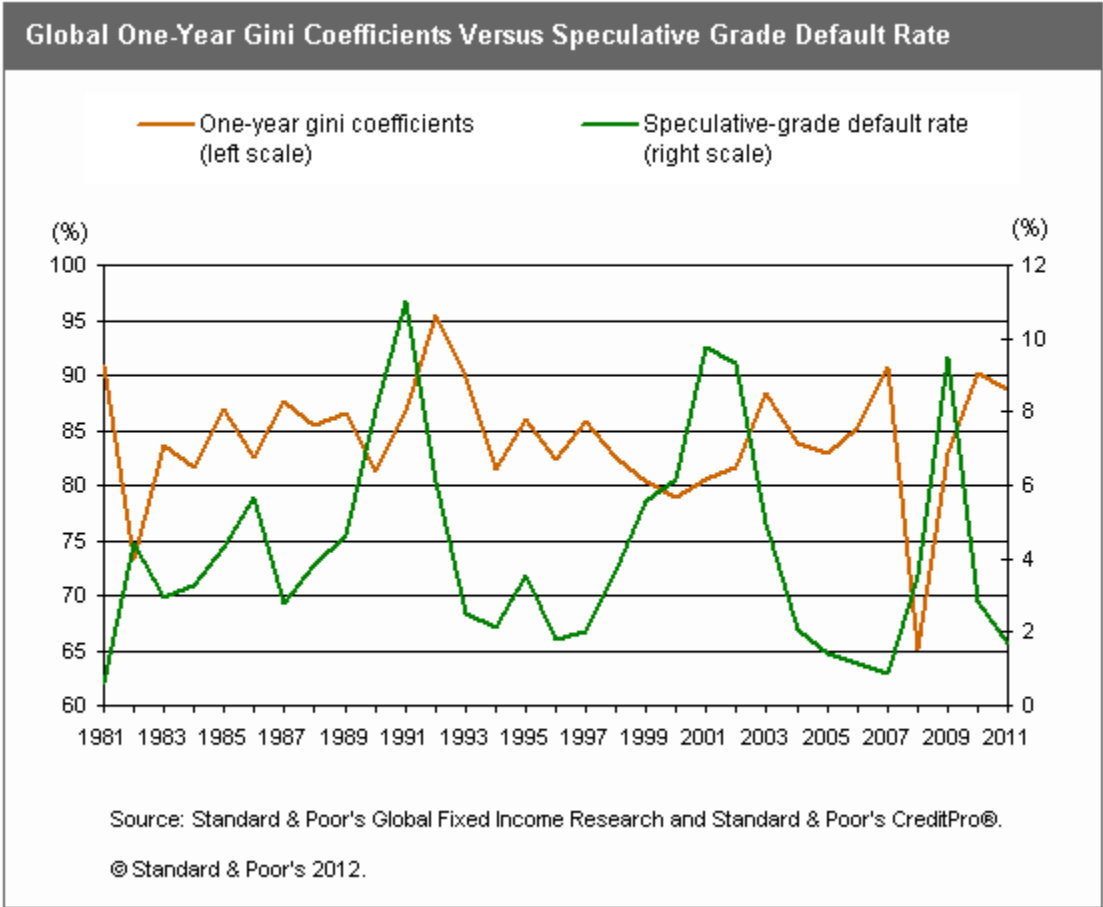
Chart 9



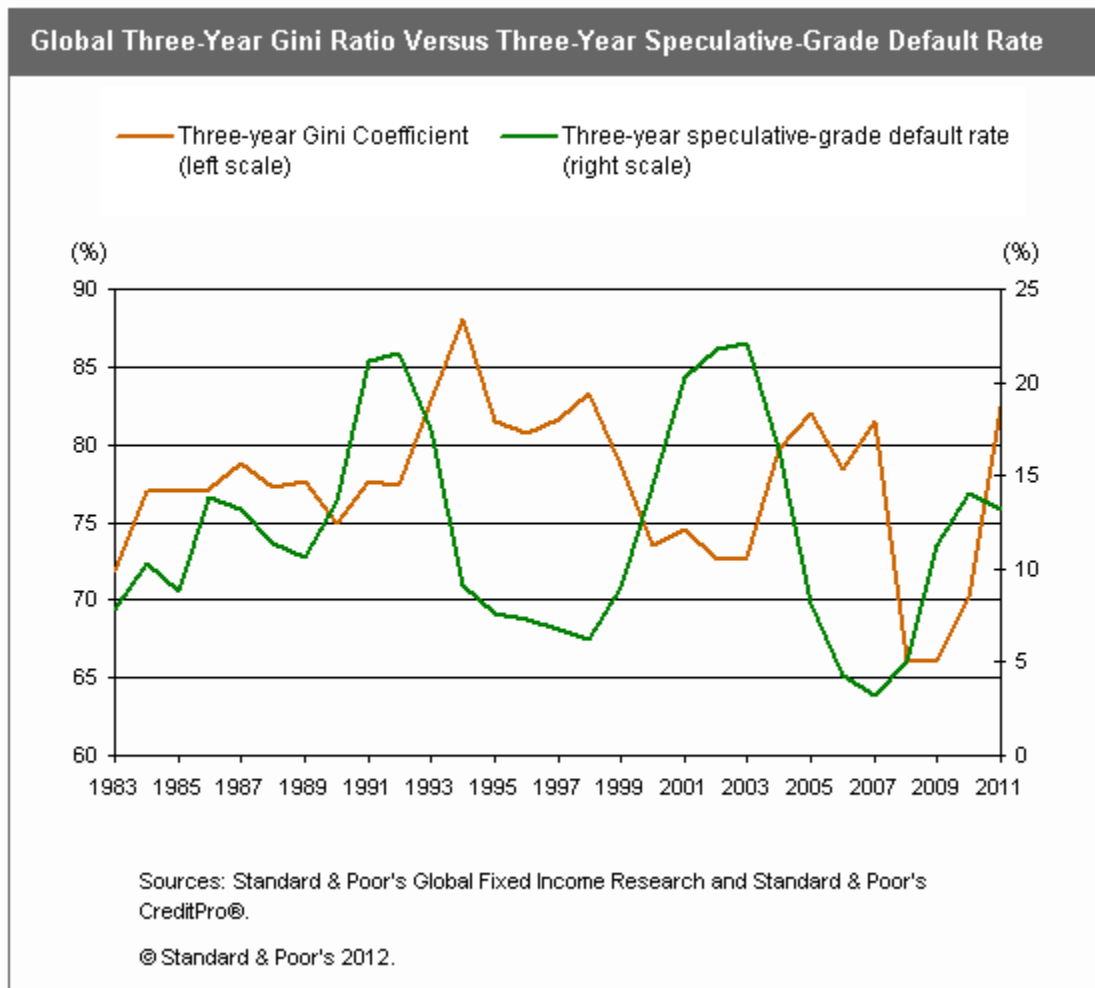
## Gini Ratio Patterns

Gini ratios, which are a measure the relative rank-ordered power of the ratings system, display cyclicity coincident with the broader economic cycle (see chart 10 for a comparison of the one-year global Gini ratios for all financial and nonfinancial issuers and the one-year global speculative-grade default rate). Trends in the one-year Gini coefficient emerge during periods of both extremes in the default rate and reflects the natural relationship between the two measures. In periods of high proportions of defaults, there tends to be greater variation with respect to how the defaults are distributed across the ratings spectrum, which reduces the Gini ratios. That is, when default pressure is high, the economic conditions are such that companies from across the rating spectrum are more likely to suffer a more rapid deterioration of credit quality. The one-year Gini coefficient dropped to an all-time low of 65% in 2008. Much of this decline is attributable to the extraordinary turbulence among global financials, which caused the sector's average Gini coefficient to decline to 78%. The pattern of broad cyclicity persists even when the Gini ratios are calculated over longer-term horizons, such as three years (see chart 11).

Chart 10



**Chart 11**



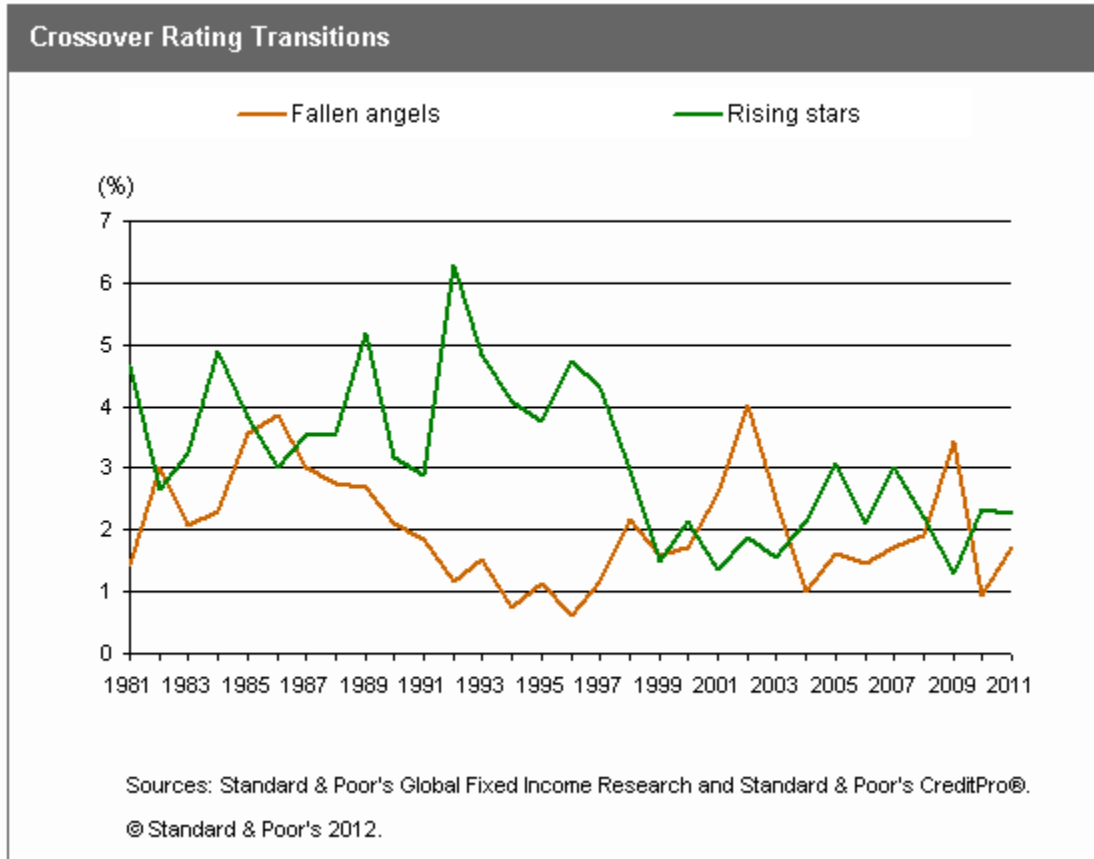
Since the relative low points in the various Ginis for 2008, the ratios increased just as noticeably afterwards, with the one-year Gini coefficient increasing to 82.9 in 2009 and further to 88.7 in 2011. A sharp increase in the Gini ratios after a period of widespread economic and financial distress is intuitive, since most of the defaulters immediately after such crisis are typically those companies that experienced harsh or numerous downgrades during the crisis, pushing them solidly among the lowest ranks of the ratings spectrum at the beginning of the period in question.

## Transition Rates

Variation is not limited to defaults. Rating transitions also experience considerable volatility from one year to the next, and across differing economic cycles. Take for example, the migration of entities from investment grade ('BBB-' or higher) to speculative grade ('BB+' and below), which we refer to as fallen angels (see chart 12). The percentage of issuers that became fallen angels shows a fair amount of variation over time, reaching peaks during times of market stress or credit dislocations (such as in 1986, 2002, and 2009). The number of rising stars--issuers that have been upgraded to investment grade from speculative grade--also varies, broadly reflecting an inverse pattern to that of fallen

angels. During periods of financial stress, the percentage of fallen angels tends to outpace that of rising stars. Since 2010, the pace of rising stars has exceeded that of fallen angels, which implies that credit conditions have been broadly improving

**Chart 12**



When looking at ratings transitions more broadly, we find that rates of ratings stability, upgrades, and downgrades vary from year to year (see table 8 for the one-year average transition matrix for global corporates.) Similarly to table 1, we expanded the transition matrix in table 8 to show descriptive statistics for each cell in a typical matrix. The figures in traditional transition matrices are weighted averages. Therefore, we included the statistical averages for each cell in order to give equal weight to each cohort year, since the weighted averages tend to be biased by more recent cohorts because the size of the corporate bond market has grown over time.

As with cumulative default rates, standard deviations give the best indication of the level of variation of the individual years in our database, which covers 31 years. In all rating categories, the largest standard deviations tend to correspond with each rating category's stability rate, which is intuitive, since all entities begin each period examined in this is the state.

Broadly speaking, the standard deviations tend to be largest with rating categories at the opposite ends of the credit spectrum ('AAA' and 'CCC/C'), and smaller with rating categories towards the middle ('A' and 'BBB'). This is largely

the result of the relative size of the rating categories as well as the inherent nature of the highest and lowest rating categories: 'AAA' rated issuers can only remain stable or be downgraded, while 'CCC/C' rated issuers are most prone to default, continued marginal deterioration, or ratings withdrawal.

**Table 8**

| <b>One-Year Average Global Transition Matrix: 1981-2011, (%)</b> |            |           |          |            |           |          |              |          |           |
|--|------------|-----------|----------|------------|-----------|----------|--------------|----------|-----------|
| <b>From/To</b>   | <b>AAA</b> | <b>AA</b> | <b>A</b> | <b>BBB</b> | <b>BB</b> | <b>B</b> | <b>CCC/C</b> | <b>D</b> | <b>NR</b> |
| <b>AAA (3704)</b>  |            |           |          |            |           |          |              |          |           |
| Weighted average   | 87.18      | 8.69      | 0.54     | 0.05       | 0.08      | 0.03     | 0.05         | 0.00     | 3.37      |
| Average  | 86.08      | 9.81      | 0.55     | 0.08       | 0.08      | 0.04     | 0.07         | 0.00     | 3.30      |
| Median   | 88.73      | 7.14      | 0.00     | 0.00       | 0.00      | 0.00     | 0.00         | 0.00     | 2.47      |
| Standard deviation   | 9.10       | 9.10      | 0.87     | 0.31       | 0.25      | 0.20     | 0.40         | 0.00     | 2.58      |
| Minimum  | 49.02      | 1.19      | 0.00     | 0.00       | 0.00      | 0.00     | 0.00         | 0.00     | 0.00      |
| Maximum  | 96.43      | 47.06     | 3.37     | 1.56       | 1.08      | 1.12     | 2.25         | 0.00     | 9.03      |
| <b>AA (13159)</b>  |            |           |          |            |           |          |              |          |           |
| Weighted average   | 0.55       | 86.37     | 8.27     | 0.54       | 0.06      | 0.08     | 0.02         | 0.02     | 4.08      |
| Average  | 0.61       | 86.75     | 8.03     | 0.56       | 0.08      | 0.09     | 0.02         | 0.02     | 3.85      |
| Median   | 0.47       | 87.24     | 7.24     | 0.28       | 0.00      | 0.00     | 0.00         | 0.00     | 3.97      |
| Standard deviation   | 0.55       | 4.93      | 4.00     | 0.73       | 0.25      | 0.25     | 0.07         | 0.07     | 1.91      |
| Minimum  | 0.00       | 73.58     | 1.65     | 0.00       | 0.00      | 0.00     | 0.00         | 0.00     | 0.47      |
| Maximum  | 1.90       | 95.05     | 18.09    | 2.79       | 1.30      | 1.22     | 0.30         | 0.38     | 7.20      |
| <b>A (27845)</b>   |            |           |          |            |           |          |              |          |           |
| Weighted average   | 0.04       | 1.91      | 87.23    | 5.45       | 0.38      | 0.16     | 0.02         | 0.08     | 4.74      |
| Average  | 0.05       | 2.04      | 87.19    | 5.52       | 0.47      | 0.19     | 0.02         | 0.06     | 4.46      |
| Median   | 0.00       | 1.81      | 87.57    | 5.30       | 0.27      | 0.00     | 0.00         | 0.00     | 4.20      |
| Standard deviation   | 0.13       | 1.15      | 3.51     | 2.11       | 0.49      | 0.36     | 0.07         | 0.11     | 1.93      |
| Minimum  | 0.00       | 0.29      | 77.76    | 2.16       | 0.00      | 0.00     | 0.00         | 0.00     | 0.82      |
| Maximum  | 0.65       | 4.63      | 92.65    | 10.61      | 2.17      | 1.60     | 0.35         | 0.38     | 7.95      |
| <b>BBB (25600)</b>   |            |           |          |            |           |          |              |          |           |
| Weighted average   | 0.01       | 0.13      | 3.65     | 84.84      | 3.91      | 0.64     | 0.15         | 0.24     | 6.43      |
| Average  | 0.02       | 0.18      | 4.43     | 83.40      | 4.51      | 0.87     | 0.15         | 0.24     | 6.21      |
| Median   | 0.00       | 0.08      | 3.86     | 83.55      | 5.05      | 0.60     | 0.00         | 0.19     | 6.45      |
| Standard deviation   | 0.07       | 0.23      | 2.31     | 4.63       | 1.84      | 1.03     | 0.24         | 0.27     | 1.83      |
| Minimum  | 0.00       | 0.00      | 1.36     | 73.33      | 1.76      | 0.00     | 0.00         | 0.00     | 2.89      |
| Maximum  | 0.34       | 0.83      | 11.59    | 90.33      | 8.81      | 4.27     | 1.00         | 1.02     | 9.70      |
| <b>BB (17181)</b>  |            |           |          |            |           |          |              |          |           |
| Weighted average   | 0.02       | 0.04      | 0.16     | 5.24       | 75.84     | 7.19     | 0.75         | 0.90     | 9.87      |
| Average  | 0.01       | 0.07      | 0.28     | 5.86       | 74.74     | 7.68     | 0.84         | 1.05     | 9.48      |
| Median   | 0.00       | 0.00      | 0.00     | 5.69       | 75.11     | 6.83     | 0.51         | 0.73     | 9.88      |
| Standard deviation   | 0.06       | 0.16      | 0.39     | 2.38       | 4.97      | 4.70     | 0.92         | 1.05     | 2.85      |
| Minimum  | 0.00       | 0.00      | 0.00     | 2.65       | 60.18     | 2.75     | 0.00         | 0.00     | 3.17      |
| Maximum  | 0.33       | 0.60      | 1.16     | 12.54      | 82.97     | 29.86    | 3.20         | 4.22     | 14.80     |

**Table 8**

**One-Year Average Global Transition Matrix: 1981-2011, (%) (cont.)**

| <b>B (18908)</b>    |      |      |      |      |       |       |       |       |       |
|---------------------|------|------|------|------|-------|-------|-------|-------|-------|
| Weighted average    | 0.00 | 0.04 | 0.13 | 0.23 | 5.56  | 73.40 | 4.41  | 4.49  | 11.75 |
| Average             | 0.00 | 0.05 | 0.25 | 0.32 | 5.59  | 73.64 | 3.83  | 4.79  | 11.52 |
| Median              | 0.00 | 0.00 | 0.09 | 0.27 | 5.08  | 74.30 | 3.33  | 3.62  | 11.38 |
| Standard deviation  | 0.00 | 0.13 | 0.37 | 0.33 | 2.53  | 5.29  | 2.56  | 3.32  | 3.02  |
| Minimum             | 0.00 | 0.00 | 0.00 | 0.00 | 2.28  | 64.19 | 0.00  | 0.25  | 5.65  |
| Maximum             | 0.00 | 0.55 | 1.49 | 1.31 | 13.10 | 84.75 | 10.42 | 13.84 | 17.03 |
| <b>CCC/C (2294)</b> |      |      |      |      |       |       |       |       |       |
| Weighted average    | 0.00 | 0.00 | 0.17 | 0.26 | 0.78  | 13.60 | 43.90 | 26.85 | 14.43 |
| Average             | 0.00 | 0.00 | 0.21 | 0.38 | 0.89  | 12.08 | 49.49 | 23.42 | 13.52 |
| Median              | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 9.26  | 48.00 | 22.37 | 13.04 |
| Standard deviation  | 0.00 | 0.00 | 0.71 | 1.02 | 1.30  | 8.53  | 12.81 | 12.70 | 7.32  |
| Minimum             | 0.00 | 0.00 | 0.00 | 0.00 | 0.00  | 0.00  | 27.13 | 0.00  | 0.00  |
| Maximum             | 0.00 | 0.00 | 3.57 | 4.00 | 4.17  | 30.77 | 83.33 | 48.94 | 29.17 |

Note: Numbers beneath rating designations are the issuer-base figures used in table calculations. NR--Not rated. Sources: Standard & Poor's Global Fixed Income Research and Standard & Poor's CreditPro®.



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