Who's Rating the Rating Agencies?

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The Importance of Credit Ratings

- General and accepted risk measurement metric
  - International Language of Credit
- Greater understanding between borrowers and lenders
- Linkage between internal credit scoring models and external agency bond and loan ratings
  - Basis for internal ratings based (IRB) models
- BIS standards on Capital Adequacy
  - 8% rule regardless of risk-until 2007 for some banks (not in the U.S.)
  - Bucket approach based on external (possibly internal) ratings – Basel II·
- Databases – Defaults and Rating Migration
  - Statistics based on original rating (Altman-Mortality) and (Static Pool-S&P), (Cohorts Moody's) yearly and cumulative defaults
  - Major influence on structured finance products
- Credit Derivatives·
  - Price linked to current rating, expected default and recovery rates, arbitrage
- Procyclicality?

The Link Between Internal and External Rating Systems to Estimate Default Rates and Loss Given Default

The Link is a Three-Step Process:

- Construct and Test an internal credit scoring system based on samples of defaulted and non-defaulted firms.
- Link the resulting credit scores with bond-rating-equivalents (BRE) from external rating agencies.
- Estimate the marginal and cumulative probabilities of default based on either the (1) original external bond rating* or (2) a basket of firms in a particular external rating on a given date**.

Or

- Direct estimation of probability of Default-Logit regression.

Marginal and Cumulative Mortality Rate Methodology

$$MMR_{(t)} = \frac{\textit{Total value of defaulting debt in year (t)}}{\textit{total value of the population at the start of the year (t)}}$$

MMR = Marginal Mortality Rate

One can measure the cumulative mortality rate (CMR) over a specific time period (1,2,…, T years) by subtracting the product of the surviving populations of each of the previous years from one (1.0), that is,

$$CMR_{(t)} = 1 - \prod_{t=1} SR_{(t)},$$

here CMR $_{(t)}$ = Cumulative Mortality Rate in $_{(t)}$,
SR $_{(t)}$ = Survival Rate in $_{(t)}$, 1 - MMR $_{(t)}$

Mortality Rates by Original Rating

All Rated Corporate Bonds*
1971-2009

		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00%	0.00%	0.00%	0.00%	0.03%	0.02%	0.01%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.03%	0.05%	0.06%	0.06%	0.06%	0.06%
AA	Marginal	0.00%	0.00%	0.27%	0.12%	0.02%	0.01%	0.00%	0.01%	0.03%	0.01%
	Cumulative	0.00%	0.00%	0.27%	0.39%	0.41%	0.42%	0.42%	0.43%	0.46%	0.47%
A	Marginal	0.01%	0.08%	0.18%	0.19%	0.15%	0.12%	0.05%	0.22%	0.12%	0.08%
	Cumulative	0.01%	0.09%	0.27%	0.46%	0.61%	0.73%	0.78%	1.00%	1.11%	1.19%
BBB	Marginal	0.42%	2.86%	1.48%	1.12%	0.68%	0.30%	0.36%	0.19%	0.18%	0.38%
	Cumulative	0.42%	3.27%	4.70%	5.77%	6.41%	6.69%	7.02%	7.20%	7.37%	7.72%
BB	Marginal	1.09%	2.23%	4.11%	2.18%	2.58%	1.50%	1.57%	1.20%	1.63%	3.30%
	Cumulative	1.09%	3.30%	7.27%	9.29%	11.63%	12.96%	14.32%	15.35%	16.73%	19.48%
B	Marginal	3.08%	8.05%	8.08%	8.18%	6.11%	4.78%	3.85%	2.35%	1.94%	0.96%
	Cumulative	3.08%	10.88%	18.08%	24.78%	29.38%	32.76%	35.34%	36.86%	38.09%	38.68%
CCC	Marginal	8.78%	13.02%	18.68%	16.34%	4.64%	12.15%	5.65%	5.11%	0.77%	4.59%
	Cumulative	8.78%	20.66%	35.48%	46.02%	48.53%	54.78%	57.33%	59.51%	59.83%	61.67%

*Rated by S&P at Issuance
Based on 2,527 issues
Source: Standard & Poor's (New York) and Author's Compilation

Mortality Losses by Original Rating

All Rated Corporate Bonds*
1971-2009

		1	2	3	4	5	6	7	8	9	10
AAA	Marginal	0.00%	0.00%	0.00%	0.00%	0.01%	0.01%	0.01%	0.00%	0.00%	0.00%
	Cumulative	0.00%	0.00%	0.00%	0.00%	0.01%	0.02%	0.03%	0.03%	0.03%	0.03%
AA	Marginal	0.00%	0.00%	0.04%	0.04%	0.01%	0.01%	0.00%	0.01%	0.01%	0.01%
	Cumulative	0.00%	0.00%	0.04%	0.08%	0.09%	0.10%	0.10%	0.11%	0.12%	0.13%
A	Marginal	0.00%	0.03%	0.09%	0.15%	0.09%	0.05%	0.03%	0.05%	0.08%	0.03%
	Cumulative	0.00%	0.03%	0.12%	0.27%	0.36%	0.41%	0.44%	0.49%	0.57%	0.60%
BBB	Marginal	0.33%	1.92%	1.26%	0.45%	0.44%	0.20%	0.15%	0.11%	0.11%	0.22%
	Cumulative	0.33%	2.24%	3.48%	3.91%	4.33%	4.52%	4.67%	4.77%	4.88%	5.09%
BB	Marginal	0.63%	1.29%	2.43%	1.27%	1.54%	0.79%	0.86%	0.52%	0.84%	1.18%
	Cumulative	0.63%	1.91%	4.30%	5.51%	6.97%	7.70%	8.49%	8.97%	9.74%	10.80%
B	Marginal	2.06%	5.63%	5.48%	5.46%	4.03%	2.63%	2.50%	1.32%	1.00%	0.69%
	Cumulative	2.06%	7.57%	12.64%	17.41%	20.74%	22.82%	24.75%	25.74%	26.49%	26.99%
CCC	Marginal	5.78%	9.34%	13.28%	11.95%	3.28%	9.15%	4.26%	3.96%	0.47%	2.94%
	Cumulative	5.78%	14.58%	25.92%	34.78%	36.92%	42.69%	45.13%	47.30%	47.55%	49.09%

*Rated by S&P at Issuance
Based on 2,099 issues
Source: Standard & Poor's (New York) and Author's Compilation

Concerns About Rating Agencies

- Credit Market Meltdown (2008-2009)
  - Structured Finance Ratings (2005-2007)
  - Current Issues (see below)
- Enron – Worldcom Debacles (2001-2002)
- Asian Sovereign Debt Issues (1997-1998)

Current Issues

- Conflicts of Interest
  - Issuer-Pays Model
- Lack of Competition
  - Both for NRSRO's and non-NRSRO's
  - Changing Landscape – Model Based Systems
- Single Estimate of Credit Quality
  - Probability of Default
  - Stressed Scenarios
- Assignment of the Raters
- Rating Language in Regulations

Rating stability and rating accuracy are conflicting investor's objectives

- "Moody's analysts attempt to balance the market's need for timely updates on issuer risk profiles, with its conflicting expectation for stable ratings" (Cantor, 2001).
- Rating stability affects the default prediction performance significantly (Altman and Rijken, 2004).
- Hamilton and Cantor (2004) have shown a significant improvement in default prediction when agency ratings are combined with agencies' Outlook / Review information.
- The agencies "through-the-cycle" methodology is aimed to find an optimal level of rating stability. This "through-the-cycle" methodology has two aspects
  - Long default horizon: filtering of short term credit quality fluctuations.
  - Prudent migration policy: a rating is triggered if the (long-term) credit quality movements exceeds a certain threshold and - if triggered - it is only partly adjusted.

The Impact of Rating-Stability Objectives on the Credit Process

• Ratings stability is an expressed objective and practice of the rating agencies and some investors [Fons, Cantor & Mahoney (Moody's) 2002, Hamilton & Cantor, 2004 and S&P (2003)].

- Avoiding rating reversals and too frequent rating changes.

• Ratings stability is consistent with a through-the-cycle (TTC) rating strategy, i.e., rating changes should be enduring.

• Impact of the stability objective on the accuracy for Type I (Default) and Type II (Non-Default) forecasts

-Rating agencies' ratings are likely to have lower Type I accuracy and higher Type II accuracy

-Can partially explain why point-in-time (PIT) models consistently outperform TTC "models" in predicting defaults, e.g., Z-Scores and EDFs have been shown to have lower Type I errors, especially for short-term (one-year) predictive accuracy?

- Longer-term (3-5 years) accuracies tend to be similar between PIT and TTC approaches.

Of concern is the timeliness of agency ratings

- Association for Financial Professionals (2002): most respondents believe that agency ratings are slow.
- Baker and Mansi (2001): 27% of the issuers and 71% of the institutional investors have doubts on the timeliness of agency ratings.
- Ellis (1998): 70% of investors indicate ratings should reflect recent changes. even if they are likely to be reversed within a year.
- Saunders and Allen (2002): case studies Enron and Worldcom.

But at the same time investor's desire rating stability

- Ellis (1998): investor's don't want ratings to be updated to reflect small, marginal changes in financial condition.
- Moody's (2002): Institutional buyside investors value the current rating stability level and do not want ratings to simply follow market prices.
- S&P (2003)

Investors, companies and financial authorities value a certain level of rating stability

1. "The value of its rating products is greatest when its ratings focus on the long term and do not fluctuate with near term performance. Ratings should never be a mere snapshot of the present situation ratings" (Standard & Poor's, 2003).

2. Timely ratings, which adjust promptly and fully to the actual creditworthiness, could deepen a financial crisis. Rating stability could dampen procyclicality effects.

3. A certain level of rating stability protects the reputation of agencies. "Better be late and right than fast and wrong".

Rating Stability: Empirical Results

(E. Altman and H. Rijken, "How Rating Agencies Achieve Rating Stability," JBF, forthcoming and NYU Salomon Center Working Paper, 2003)

Major Sources of Observed Rating Stability Tested

- Rating agencies change ratings only when they are reasonably sure that there will not be a subsequent reversal (a type of speed-of adjustment factor) resulting in a "migration policy."

- Rating agencies use stressed-events scenarios in a "Through-the-Cycle" methodology to assess default probabilities and this results in slower adjustments.

Methodology of the Study (Altman & Rijken, 2004)

Compare Results from Three Models:

1. A point-in-time model from a logit-regression of firm financial characteristics on **actual default events**, which results in a type of "distance-to-default" metric (**Default Prediction [DP] Score**).

2. An **Agency-Rating-Score** (**AR Score**) resulting in predictive values from a multinormal logit regression of **actual assigned ratings** using the same financial characteristics as found in the DP Scoring approach. Assume that the predicted credit rating represents a Through-the-Cycle rating of firms without any "migration policy" of agencies.

3. **Actual Agency Credit Ratings** (**1-17**), which represents the agencies', own models and migration policy.

Major Findings

- Actual agency ratings are **more stable** than results using model-ratings from the **DP** and **AR** models. The likelihood of a change in a rating in one year is about three times greater for a DP-Model than the actual observed rating change.

- We observe a "**drift**" in ratings over time in actual rating changes whose magnitude is conditional on whether there was downgrade or an upgrade in the prior period (the well known autocorrelation of negative rating changes). In contrast, there is no drift observed in DP or AR model results. [Thus, we conclude the observed "drift" is due to "**migration policy**" on the part of rating agencies].

- Agencies only partially adjust their ratings based on comparing changes in AR scores with actual rating changes (i.e., adjustments are typically made in two or more steps instead of a full adjustment). The agency rating migration "policy" is characterized by a threshold of 1.8 notch and an adjustment fraction of 0.65.

- Therefore, both the stability objective and the migration "Policy" of rating agencies affect the timeliness of agency ratings.