MOODY'S ANALYTICS

RISKCALC FAQ

How is the Static EDF-Implied Rating Mapping Determined?

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Abstract

Moody's Analytics RiskCalc™ is a model suite designed specifically for analyzing and measuring private firm default risk. All RiskCalc 3.1 and 4.0 models use a common mapping to translate an EDF™ (Expected Default Frequency) credit measure into what we term a static EDF-Implied Rating. This FAQ describes how and why this mapping was designed and demonstrates its current applications.

Introduction

To quantify credit risk, clients sometimes prefer to use a discrete rating scale, such as Moody's letter grades, rather than a probability scale. For example, users not familiar with probability measures may prefer using and thinking in terms of agency ratings. Further, a meaningful mapping of internal ratings to rating grades with sufficient risk differentiation is a regulatory requirement. To address the need to translate RiskCalc EDF measures into a rating scale, we provide the static EDF-implied rating mapping.

There are many possible approaches to mapping RiskCalc EDF measures to a rating category, and many of them are used in practice. Since such mappings can be used for different purposes, the most appropriate depends on how the mapping is being used. RiskCalc mapping facilitates the process of a financial institution moving from an internal rating system in which the majority of credits end up in one of two categories to a system that yields a more granular differentiation of credit risk. Our static mapping balances a number of competing objectives. Specifically, the EDF-Implied Ratings intend to accomplish the following:

» Provide consistent meaning across industries and different geographies throughout the world

» Be reasonably consistent with the default rates of bond ratings as measured by Moody's Default Studies (Ou, et al., 2015)

» Cover a reasonably large range of rating categories from Caa – C to A1 or even higher, depending on the model

» Not cluster too many credits into a small number of classifications

» Have a similar distribution of 5-Year and 1-Year EDF-Implied Ratings

» Be somewhat conservative, i.e., to rarely, if ever, generate an EDF-Implied Rating of Aaa

With these objectives in mind, we constructed our static EDF-implied mapping. The section below shows how our mapping lines up with Moody's Investors Services Corporate default rates for each rating category.

EDF-Implied Ratings

Figure 1 and Figure 2 present the midpoints of the mapping along with the actual default rates from Moody's Default Study. The 1-Year rates are taken directly from Exhibit 29 of Moody's Investors Services (MIS) default study (Ou, et al. (2015)). They represent average default rates from 1983 – 2014. The 5-Year rates are taken from the corresponding 5-Year transition matrix found in Exhibit 10 of Chiu, et al. (2014) and correspond to the 1983 – 1H 2014 time period. For Caa/C, we plot the simple average across the values for Caa1, Caa2, and Caa3 categories.

Figure 1 The 5-Year mapping of EDF measures to EDF-implied Ratings

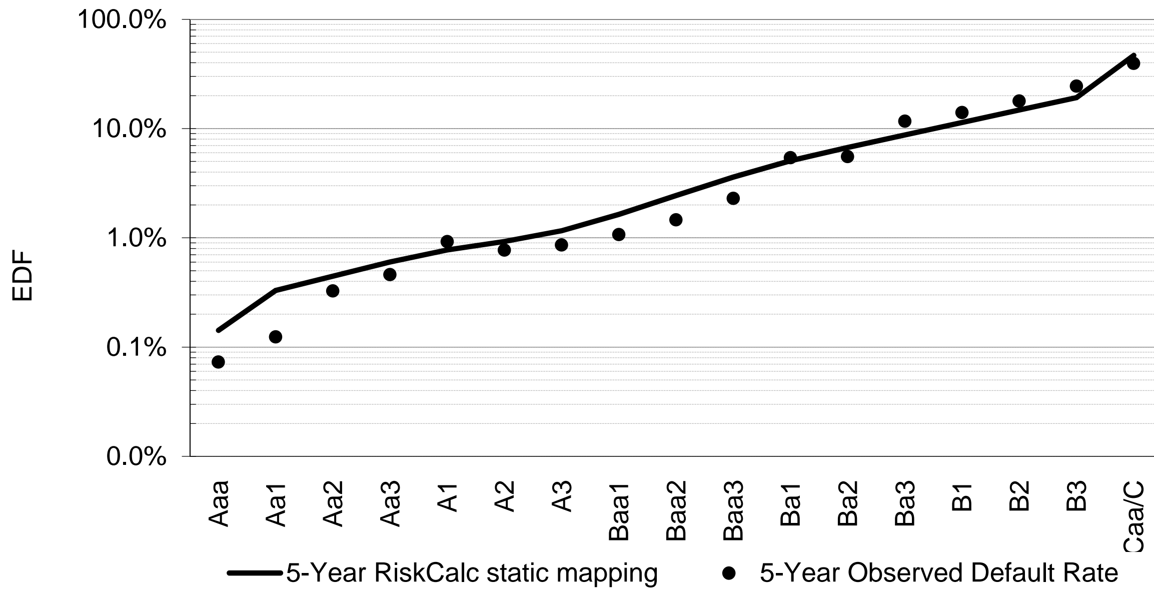
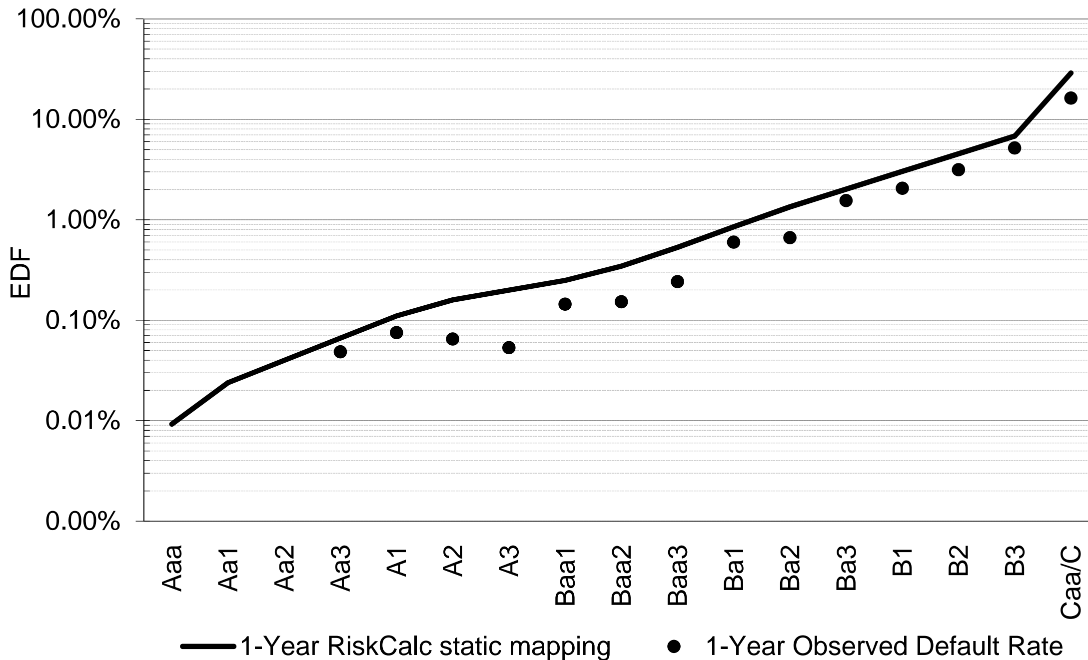


Figure 2 The 1-Year mapping of EDF measures to EDF-implied Ratings[1]



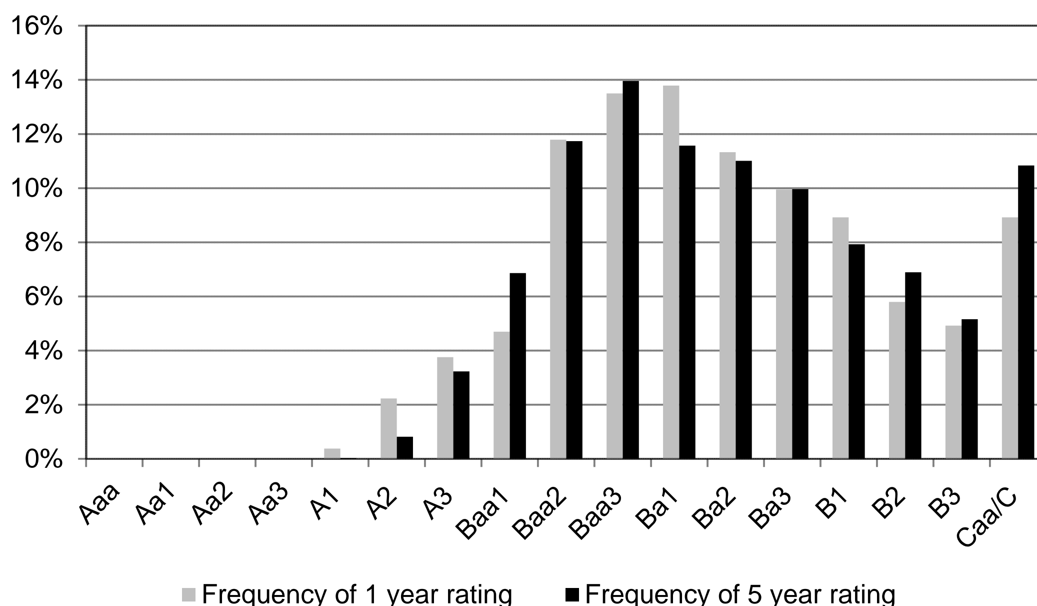
The EDF-implied mapping balances the above mentioned criteria. The 5-Year mapping is in-line with the default risk of bonds as measured by the MIS default study. The 5-Year mapping is mostly conservative when compared to the actual default rates in the

[1] For rating categories Aaa, Aa1, and Aa2, the absence of a dot implies a zero default rate, which cannot be represented on a log scale.

Aaa-Ba2 range and is only slightly below the realized default rates in the Ba3-B3 range. The 1-Year mapping is in-line with 1-Year observed default rates and is more conservative when compared to the actual default rates, which shows that the mapping still works very well. For the Aa3 and above, the actual 1-Year default rates are approximately zero, while the EDF-implied mapping shows a small but positive default risk for such companies. This difference is due to the nature of private firm risk versus rated bonds. We find that private firms with very low default risk over a 5-Year horizon still have a very small but positive risk of default over a 1-Year horizon, whereas, for public debt rated at A1 and above, default risk is very close to zero.

The impact of our mapping can be better understood by examining the resulting EDF-Implied Ratings histogram.[2] Figure 3 shows the distribution of EDF-Implied Ratings for the 1- and 5-Year models for RiskCalc 4.0, private firms in the U.S. The data used is up to 2014. The mapping demonstrates the intended properties. It generates a useful range of ratings for both the 1-Year and the 5-Year models: the EDF-Implied Ratings range from Caa/C to A1. The distributions of the 1-Year and 5-Year EDF-implied Ratings are similar. Less than 20% of the credits show up in one rating category — well within the 30% limit set by the Basel Accords.

Figure 3 The Distribution of EDF-Implied Ratings (RiskCalc United States 4.0)



We have not changed the static EDF-implied mapping since the first v3.1 model was introduced in 2004, and we do not have plans to make further changes at this time. The mapping continues to meet the objectives for which it was designed: consistent meaning across industries and geographies, reasonably consistent with observed default rates of bonds, covering a large range of ratings, etc. The updated Figures 1 and 2 are also reassuring; the implied rating default rates are still very close to the actual bond default rates. The issue that we watch closely is the grouping of the rating categories Caa1, Caa2, Caa3, Ca, and C into one category. The justification for not separating out the rating categories Ca and C follows from their definition of "likely in or very near default" by the rating agency (Moody's Investors Service, 2015). Consequently, the mapping does not associate an EDF credit measure with ratings this low. We broke the rating category Caa into Caa1, Caa2, and Caa3 in 1997. Recently, MIS has begun separately reporting default rates for these categories in their default studies. At this time, we do not see any benefits from increasing the granularity in the Caa/C category outweighing the transition costs, but we may revisit this issue in the future. More information on the breakdown of the Caa/C category is available upon request.

[2] In order to meet the first objective, we use only one mapping uniformly across all v3.1 and v4.0 models to date. The actual distribution of implied ratings produced by different models and different samples will differ according to the characteristics of the samples and the models.

References

Chiu, David, Sharon Ou, and Albert Metz, " Average One-to-Five-Year Corporate Rating Migration Rates, 1970 - 1H2014." Moody's Investors Service, 2014.

Emery, Kenneth, Sharon Ou, and Jennifer Tennant, "Corporate Default and Recovery Rates, 1920-2007." Moody's Investors Service, 2008.

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