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May 27, 2021

Mr. Philip Barlow
Chair
Life Risk-Based Capital Working Group (LRBCWG)
National Association of Insurance Commissioners (NAIC)

Dear Philip,

The American Academy of Actuaries[1] C1 Work Group (C1WG) appreciates the opportunity to comment on the exposure drafts of factors for bonds (*Exposure of American Academy of Actuaries' and American Council of Life Insurers' Proposed Bond Factors and Instructions*, exposed by the LRBCWG on April 21, 2021). We recognize the tight timetable to adopt a set of bond factors by June 30, 2021, and as such our comments will highlight the areas of greatest importance consistent with this timeline. In particular, our letter highlights those areas that are both material to the resulting factors and represent the greatest difference with the C1WG's updated factors.[2]

The choice before the LRBCWG involves two different methodologies to forecast credit risk for the purpose of determining capital requirements. With the exception of the corporate tax rate, the C1WG's recommendations are based on the existing C1 bond framework with updated assumptions consistent with the timeframe when the majority of our modeling was conducted (in the early 2010s). The C1WG has provided extensive analysis, documentation, and explanations for the updated factors. Our work was guided by the request of regulators and several discussions with regulators throughout our work.

Moody's Analytics (MA) has provided the LRBCWG with an alternative approach using a different method for measuring credit risk along with different assumptions. Some of its modeling choices have been described as more sophisticated and utilize more modern techniques. Some of the methods used by MA to project credit losses not only update for recent experience, but also represent a philosophical departure from the methods that have been used in establishing capital requirements. While some of their methods may do a better job projecting credit risk, it is difficult to completely analyze the differences without full disclosure and detailed documentation of the basis and assumptions used in the MA model.

[1] The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues. The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.
[2] https://www.actuary.org/sites/default/files/2021-03/C1_Bond_Factor_Tax_Update_03112021_Final.pdf.

Nevertheless, comparing the MA recommended factors to the factors recommended by the C1WG, we make the following high-level comparisons based on some rudimentary analysis:

A. MA modeled loss experience has almost no effect, on average, on the bond factors but has significant effect across ratings. Modeled loss experience is a combination of the assumptions for default rates, loss given default (1 – recovery percentage), and the use of a correlated default rate approach;
B. MA risk premium assumptions decrease the factors by approximately 18%; and
C. MA discount rate assumption increases the factors by approximately 6-7%.

In the following section, we identify our most significant questions with each of these major areas of difference.

A. Modeled Loss Experience

The C1WG estimates the MA base factors are 0.2% lower than the C1WG's factors due to differences between the C1WG and MA assumptions for modeled loss experience where the materiality of those differences varies by rating class. Isolating only the modeled loss experience, the MA factors for Aaa-A1 ratings are lower than the C1WG bond factors on average by 11.3% while the Baa1-Caa3 factors recommended by MA are higher by 12.5% on average. Though not completely quantifiable due to undisclosed assumptions, our analysis suggests that most of the difference in modeled loss is attributable to the default rate assumption rather than the recovery assumption.

1. Default Rates

A comparison of default rates assumed by MA and the C1WG is challenging given the use of different time periods for the experience and MA's use of a tailored life industry default series. We observe that the additional eight years of default experience reduces the default probabilities for all corporate sectors combined. If the C1WG used the additional eight years in its model, the C1 bond factors would decrease. Whether to use the additional eight years would be the subject of significant discussion; the C1WG would explore if 38 years of experience should be used, or whether it would make sense to use a set time frame (e.g., 30 or 35 years).

Further complicating the comparison of base default rates is that MA uses default rates specifically developed for the life insurance industry. MA's decision to include or exclude certain experience results in a downward bias for Aaa-A2 issuers and an upward bias for Baa1-Ba2 issuers as compared to default experience for the entire corporate sector. These customized default rates resulted in the "steeper slope" for the 20 C1 bond factors, resulting in lower capital charges for the highest investment-grade bonds.

In the next several paragraphs, we expand on the observations above. However, the overriding consideration for regulators should be whether the capital requirements should be based solely on aggregate historical default probabilities for the entire corporate sector applied to typical life

insurance portfolios, or whether capital requirements should be based on customized default probabilities (i.e., historical experience adjusted for outliers, shifting sector allocations, and other subjective considerations). The current basis for capital requirements is historical default experience for the entire U.S. corporate holdings (financials, industrials, and utilities).

Figure 1 shows that the additional default experience of 2013–2020 decreased 10-year cumulative default rates by about 20% with all quality ratings showing lower default rates except for Aa1 (note that 1983–2020 experience is in the numerator and 1983–2012 experience is in the denominator). Ratings below B3 are not shown because they are not available for Caa1-Caa3 in the 1983–2020 Moody's report (*Moody's Annual Default Study*, January 28, 2021).

Figure 1

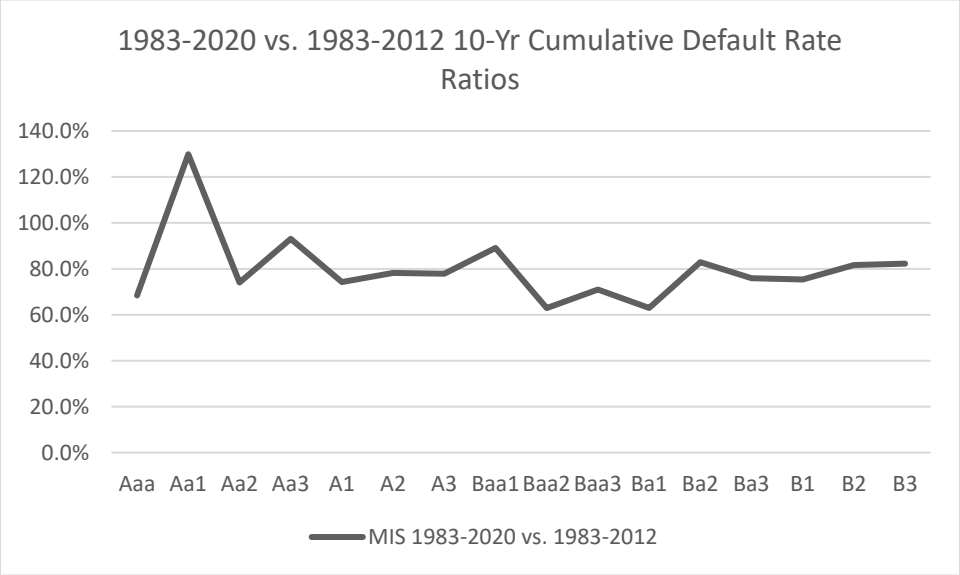


Figure 2 shows the ratios of the default rates assumed vs. reported by Moody's Investor Service (MIS) for the respective experience periods evaluated by the C1WG and MA. The MA ratios show a downward bias of assumed rates for Aaa-A2 and upward bias for Baa1-Ba2 whereas the C1WG ratios tend to track more closely to 100% of the MIS default rates.

Figure 2

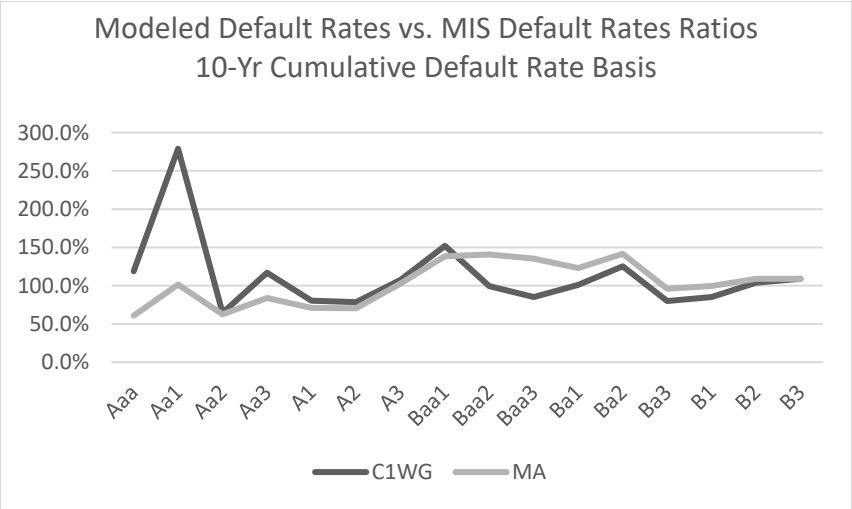


Figure 3 shows a side–by-side view of the values embedded in the ratios of Figure 2. The bias described above of the MA rates is apparent in the right-hand graph.

Figure 3

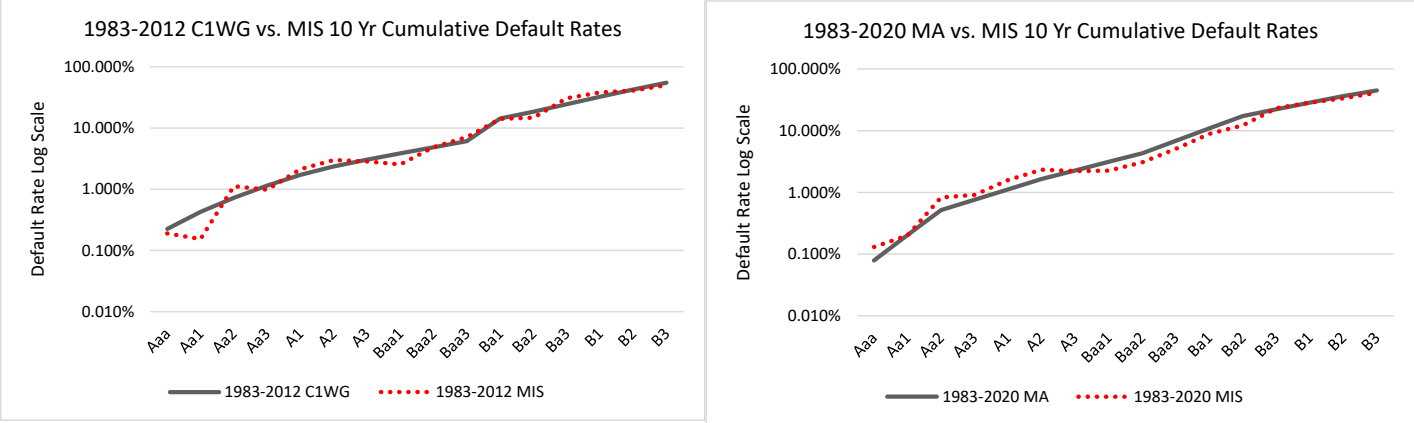
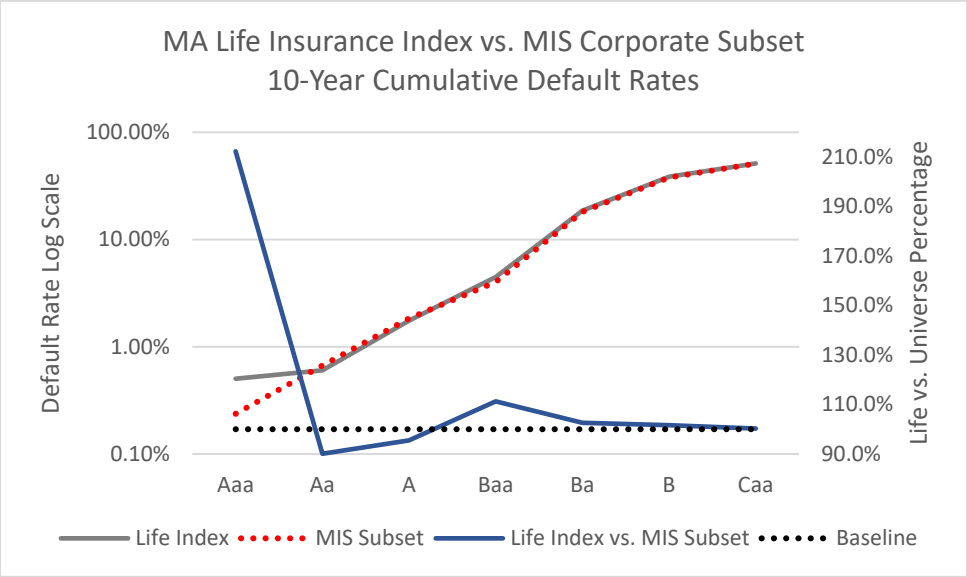


Figure 4 shows the 1983–2020 10-year cumulative default rates for U.S. corporates (a subset of the annually reported MIS default rates) before smoothing and adjustments on two bases: 1) MA's tailored life insurance series (Life Index) based on life insurance industry sector weightings and, 2) the MIS U.S. corporate rates (MIS Subset) weighted by total corporate issuance of the sectors shown. Because the rate differences are difficult to illustrate using base values, they are shown as the percentage of the Life Index to the MIS Subset in the right-hand secondary axis. The bias of the MA Life Index rates above and below the MIS Subset rates suggests that at least some of the bias noted above is due to the construction of the tailored life insurance default rates. Because the MA Life Index rates are unsmoothed in this view, the bias for Aaa is not apparent.

The tailored Aaa life insurance default rate was reduced from 0.503% to 0.079%.

Figure 4



Based on the above analysis in Figures 1-4, the C1WG concludes that there is a downward bias for higher ratings of default rates assumed by MA relative to historical 1983–2020 default rates published by MIS. This is due at least in part to the tailored weightings of life insurance industry exposure of sector-specific default rates.

The MA default rates relative to the MIS rates for the same period are also affected by the selection of a subset of the MIS universe as described in the MA documentation. These filters produced the default rates shown in Tables 8 and 16 that directly inform MA's baseline empirical default rates, as described in Appendix Section 8.2. Because the filtering process does not completely reconcile the starting point of the MIS published rates and the endpoint of the U.S. corporate issuers, the C1WG is unable to draw further conclusions about the appropriateness of these exclusions and the resulting subset of U.S. corporate-based default rates.

A few additional comments:

a. MA has separated default experience for three different sectors (utilities, financials, and industrials). Based on conversations with Moody's Investor Services, our understanding was that differences in expected loss were captured in the assigned rating class. We are curious why different C1 bond factors are created for different sectors, given that Global Ratings Methodology assigns equivalent ratings across all sectors. The LRBC calculation relies on the assigned rating from an NRSRO (nationally recognized statistical rating organizations) and the principle of equivalent ratings by sector. Why is MA subdividing default experience by sector when MIS has stated the equivalence of ratings by sector?

b. The downward adjustment of Aaa experience based on removing the two selected events as outliers (Getty Oil and Texaco) has contributed to pulling down the MA loss curve for higher-quality ratings. This pulling down of the fitted curve at its inception point contributes to the difficulties of tracking closer to MIS experience. We are curious as to why this modification was made, given the apparent bias created. Additionally, the Aaa default probability is used as an anchor point for all other default probabilities along the credit spectrum; therefore, while life insurers have a relatively small exposure to Aaa securities, adjusting the Aaa loss assumptions downward affects all exposures.

2. Variation of Baseline Total Loss Experience

The C1WG model uses an economic state model to project different loss experience that varies with the economic state (i.e., contraction, expansion). The C1WG bond model projects loss experience over 10,000 economic scenarios, with the resulting C1 bond factors developed from equal weighting of the scenario specific results. Moody's is recommending a different approach using a more complex model that assumes correlated loss experience between bonds. MA analysis showed that use of this correlation model increased total loss from the base case by 24-28%. The C1WG's analysis concluded that its economic state model increased total loss from the base case by 26%. Therefore, the approach for reflecting how total loss varies due to economic conditions is approximately the same on average but the effect varies materially by rating.

The documentation provided by MA does not describe how its correlation algorithm was calibrated and validated against actual default experience. In parameterizing the economic state algorithm, the C1WG's bond model increased losses in contractions and decreased losses in expansions. Additionally, we compared the "stressed results" to actual loss experience to ensure the model was reasonable over the entire 10-year projection period.

While there may be validity in assuming correlation within a bond portfolio, the approach used by MA is a significant departure in method. Without further study and greater disclosure of the MA model, it is difficult to provide additional comments.

3. Recovery Assumptions

The differences between MA and the C1WG on this assumption are relatively minor. The average loss given default (LGD) for MA is 52% while the average LGD used by the C1WG is 53%. Each entity uses a histogram of possible recovery percentages in developing its respective sets of C1 bond factors. The C1WG used recovery assumptions for senior unsecured debt as approximately 85% of bonds held by life insurers are senior unsecured bonds. While MA also used senior unsecured debt as the assumed lien position, it produced a weighted LGD tailored to the sector mix of life insurance industry holdings. The difference as modeled by MA between the C1WG and MA LGD assumptions was described as a "moderate decrease" in MA's April 15, 2021, presentation to the LRBCWG. These slight differences between the recovery assumptions do not appear to be material relative to other assumptions (particularly the default rate).

B. Risk Premium

As we have discussed in our July 17, 2018, letter[3] to the Investment Risk-Based Capital (IRBC) Working Group, we continue to recommend the use of the mean of the loss distribution for the risk premium (RP). The RP assumption was established when the existing NAIC solvency framework was implemented. The C-1 bond factors assume that statutory policy reserves cover moderately adverse conditions, approximated as one standard deviation. The Asset Valuation Reserve (AVR) bond component is assumed to cover risks between the mean and one standard deviation, with the C-1 bond component covering risks between one standard deviation and the 96th percentile. Capital requirements for life insurers are not intended to make up for any deficiencies in reserve requirements and do not make allowances for any excesses or deficiencies in statutory policy reserves. Finally, the C-1 bond factor is applied to all bonds, and not just those bonds backing statutory policy reserves; consequently, any offset for the C-1 factor should only apply to those assets backing policy reserves.

If the RP is changed in the C1 bond factors, then the AVR Bond Component should be reviewed as well as the requirements for reflecting credit risk in statutory policy reserves, including the Actuarial Opinion and Memorandum. Reducing capital requirements for credit risk under the guise that statutory policy reserves cover a larger portion of credit risk than when RBC was first designed should be done with the assurance that corresponding provisions have been made for statutory policy reserves.

C. Discount Rate

We believe the use of a discount rate updated for recent experience, consistent with other updated assumptions, is appropriate.

D. Modeling Questions

1. Representative Portfolio

2. Cash Flow Projections

3. Stochastic Scenario Calculation

We also have questions related to the modeling mechanics and the derivation of the specific bond factors. Our understanding of the Moody's loss assumptions is that they were developed for a typical life insurer's bond portfolio. MA has used default probabilities that have been customized for the life insurance industry by removing specific default events and

[3] https://www.actuary.org/sites/default/files/files/publications/Academy_C1WG_RP_Assumptions_071718.pdf.

altering the sector weightings (e.g., reducing the weight assigned to financials, a sector with poor credit experience in the Great Recession). Those default probabilities are applied to a modeled portfolio of bonds to project credit losses. What are the characteristics of that portfolio?

The C1WG's factors were based on sector-wide loss given default experience for all corporate bonds (public bonds, senior unsecured) and applied to a representative portfolio for life insurers. The C1WG calculated the after tax base factor capital (before the portfolio adjustment) as the after tax present value of the maximum loss over a 10-year period. Losses are defined as the total annual losses offset by annual risk premium. Losses occurring before the end of the 10-year period are reinvested at the original quality rating and subject to subsequent additional loss until the end of the original 10-year period. Losses for these preliminary base factors were calculated at the 96th percentile level.

Although an 824-issuer portfolio is referenced in the MA documentation, it is not clear how this portfolio is used in the MA projection of bond losses. Also, there is no description of the projection mechanics (e.g., scenarios, calculation of the scenario-specific factor, scenario weights, etc.).

The components for determining projected losses comprise a material assumption and are critical to gaining comfort with the recommended factors.

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We continue to encourage the LRBC to adopt the factors recommended by the C1WG. These factors were developed in response to the request of the C1WG by regulators, which was to update the C1 bond factors, consistent with the prevailing solvency framework for U.S. life insurance companies. Throughout the lengthy process in which the NAIC has been considering this proposal, the C1WG has worked with regulators and industry in evaluating the merits of different modeling choices and the impact of assumptions. Our recommended factors reflect the regulators' decisions leading up to the request being made and during this process. These factors satisfy the regulator-stated objectives of identifying potentially weakly capitalized companies using public information reported in statutory financial statements. A key question may be whether regulators are seeking a new framework for the factors or a framework to pursue factors in line with the prior framework.

We continue to be available to answer regulators' questions and look forward to the final disposition on this lengthy project.

Sincerely,

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Co-Chairperson, C1WG

Jerry Holman, MAAA, FSA, CFA

Co-Chairperson, C1WG