C1 Bond Factor Development

Presentation to NAIC's Investment Risk-Based Capital Working Group

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Discussion Outline

- Update on Critical Tasks
- Academy C1 Work Group Working Construct
- C1 Modeling Analysis and Output
- Upcoming Major Decisions for NAIC's Investment RBC Working Group

Corporate Bond Model Development
Update on Critical Tasks

- Finalize total loss assumptions
  - Default assumptions
  - Recovery assumptions
  - Economic condition model (varying the level of loss depending on recession or expansion condition using stochastic modeling techniques)
- Finalize tax assumptions
  - Pre-tax factors will be generated by the model
  - An explicit tax adjustment will be calculated in the RBC calculation (LR 30)
  - Tax assumptions are being reviewed in light of change to DTA
- Define the representative portfolio
  - Portfolio has characteristics similar to average industry portfolio
  - The representative portfolio is input for the bond model
- Define the expected loss reflected in policy reserves (i.e. actuarial benefit reserves)

Corporate Bond Model Development
Target Timing

- Construct the representative portfolio (June 1)
- Define all model logic and assumptions (July 1)
- Generate base C1 factors for corporate bonds; begin analysis and testing (July & beyond)

Capital Requirements for Corporate Bonds: Technical Considerations

- C1 bond factors are applied at the ***issue*** level according to the NAIC ratings designation
- Published default studies are based on probability of ***issuer*** default. Not every issue has an issuer rating.
- Published recovery studies are based on recovery by lien position (i.e., instrument type) and provide limited information on recovery by rating class
  - Collateralization and degree of subordination have greatest effect on recoveries, with other factors having some minor effect (e.g., economic conditions, industry)
  - Per Altman's 2010 study,* the variability of recoveries is high
- Generally, rating agency's published ratings reflect expected recovery. C1 bond factor development must consider the full distribution of recoveries, i.e., the tails of the recovery distribution.

* A Flexible Approach to Modeling Ultimate Recoveries on Defaulted Loans and Bonds, Altman & Kalotay

Capital Requirements for Corporate Bonds:
Working Hypothesis for Academy C1 Work Group

- Calculate capital requirements from a two dimensional matrix where rating and lien position are the two dimensions.
- The rating class dimension reflects frequency of default and the lien position dimension reflects the loss severity. Preliminary analysis suggests a 12 X 2 or 12 X 3 matrix of C1 bond factors.
- Loss frequency will be differentiated by rating class
- Loss severity will be differentiated by seniority instrument such as Senior Secured, Senior Unsecured and Subordinated.
- The recommended form of the C1 calculation (i.e., matrix size) will be determined based on risk analysis, the results of the C1 modeling, materiality and testing.

Capital Requirements for Corporate Bonds:
Working Hypothesis for the Academy C1 Work Group

- Factors will be applied at the issue level, as with current C1 basis.
  - Issuer level was considered, but not practical to implement.
  - Using issue rating will tend to overstate RBC if issue/issuer ratings cross NAIC categories. As the number of rating classes increases, issuer basis would be more accurate.
  - The degree of accuracy in the RBC calculation will be affected by the number of rating classes used.
- TBD: Will factors be modified for bonds not carried at par?
  - RBC is understated for bonds with carrying value > par value
  - RBC is overstated for bonds with carrying value < par value
  - Current modeling approach defines loss relative to par value
- Testing of the matrix concept will be essential before making final recommendation.

C1 Bond Modeling Analysis & Output

- Generate preliminary C1 base bond factors for different time frames and confidence levels
  - Identify & illustrate the major assumptions
  - Conduct sensitivity testing as needed
  - Standardize output to include different tolerance levels for all classes
- Recommend changes to AVR consistent with C1 bond factor recommendations
- Work with regulators and industry to test the impact of recommendations
- Evaluate need for adjustments to base C1 factors (e.g., diversification via the top ten holdings)
- Document assumptions and modeling process

C1 Bond Modeling Analysis & Output (cont.)

- Recommend C1 factors for non-modeled fixed income classes
  - Private Placements
  - Municipals
  - Structured securities (i.e., those structures not modeled by BlackRock/PIMCO such as CLOs, CDOs, ABSs)
  - Hybrids
  - Mezzanine Debt
  - Preferred Stock
  - Other asset classes
- Review consistency of corporate bond factors with other modeled asset classes
  - Structured securities modeled by BlackRock/PIMCO
  - Commercial Mortgages

Upcoming Major Decisions for NAIC's Investment Risk Working Group

- Decide on structure of C1 charges
  - Decide on matrix/vector structure for C1
  - Decide on the number of NAIC designations
  - Academy analysis will present results for each rating category to facilitate determination of the number of designations (where the data is statistically significant)
- Decide on RBC protection level for all asset types
  - Time horizon (e.g., 10 years)
  - Risk metric (e.g., percentile, CTE)
  - Statistical level (e.g., 95th percentile, 90 CTE)
  - Consistency among asset classes, RBC formulas
  - Academy analysis will present results for different protection levels
- Decide on the degree of consistency between Life, Health, and P&C Blanks and RBC formulas

Upcoming Major Decisions for NAIC's Investment Risk Working Group (cont.)

- Coordinate implementation
  - Timing: all asset classes at one time? Phase in changes over time? Change all RBC formulas at same time?
  - Timing: formal recommendation to other NAIC groups
  - Reflect designations in statement blank
  - Reflect changes in AVR
  - Reflect changes in RBC worksheet and instructions for all affected formulas
  - Determine if other NAIC processes require revision

Comments/Questions?

- Additional background on current C1 bond factors
  - Report: http://www.actuary.org/files/Bond_Factors_Report_050112.pdf
  - Companion Presentation: http://www.actuary.org/files/Bond_Factors_Presentation_050112.pdf
- Contact Academy's C1 Work Group Co-Chairpersons
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