

# **C-1 Factors for Corporate Bonds Project Update**

**Presentation to the NAIC's IRBC Working Group**

**Nancy Bennett, Co-Chairperson  
American Academy of Actuaries C1 Work Group**

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# Presentation Outline

- Methodology for Calculating C1 Factors
  - Calculating the base C1 Factors
  - Technical Considerations
- Results – round two
  - C1 Factors for Corporate Bonds
  - Summary of Major Assumptions
  - Changes from December results
  - Major Items Under Review
- Recommended Bond Classifications and C1 Matrix
- Next Steps for C1WG
- Decisions for NAIC's Investment Risk Working Group
- 2014 Plans



# Calculating Base C1 Factors

- The C1 capital charges are derived from a simulation model where the cash flows for a representative bond portfolio are projected assuming different economic scenarios.
- The required capital for a given economic scenario equals the amount of initial funds needed such that the accumulation of this initial amount and subsequent cash flows will not become negative at any point throughout the modeling period. Requiring capital to pre-fund the greatest loss is more conservative than pre-funding the cumulative losses over ten years.
- Additions and subtractions from this fund are projected over the modeling period:
  - Additions include an annualized risk premium, interest and tax recoveries of default loss
  - Subtractions include the loss given default and taxes on earned interest



# Calculating Base C1 Factors (cont.)

- The required capital for a given economic scenario equals PV of the net cash flows discounted at a specified interest rate.  $DR = 5\%$  before tax.
- The C1 factors pre-fund the greatest loss during the ten year time horizon – not just the PV of cumulative losses throughout the entire ten years.
- Simulations project varying economic conditions where default rates and recoveries vary from a baseline assumption dependent on the probability of the future economic state (expansion, recession).
- Required capital amount for each simulation is divided by beginning assets to get a required capital factor
  - The required capital factors for each economic scenario are rank-ordered, thereby producing a statistical distribution of total loss factors
  - Tentative C1 charges shown represent a 92<sup>nd</sup> percentile, 10 year time horizon safety level



# C1 Technical Considerations

- Factors will be applied at the issue level, as with current C1 basis
  - Since loss data is based on the issuer, developing issuer-specific C1 factors was considered, but not practical to implement; the bond engine will be adjusted accordingly.
- 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



# Key Modeling Assumptions

- Expected default rates from the Moody's Corporate Bond Default Study: 1983-2012.
- Expected recovery rates derived from S&P proprietary study covering 1987-2012. Rates vary by instrument type.
- Preliminary results explicitly reflect instrument type.
- Corporate tax rate and timing of loss recognition, updated for current data, reflecting SSAP 43R.
- Representative portfolio constructed to represent the typical portfolio for an insurer
  - Portfolio characteristics capture the key variables that will have the greatest effect on the variability of capital between companies; characteristics include size, quality ratings, and instrument types.
  - NAIC provided information on every bond position for every life insurance company as of December 31, 2011; data provided did not identify company or asset cusips. Data represented approximately 287,000 positions; 782 companies.



# Key Modeling Assumptions (cont.)

- Modeling assumes expected losses included in statutory policy reserves are quantified as a constant number of basis points, a risk premium (RP).
  - The RP is defined as the expected loss over ten years for each rating class: a level, annualized risk premium.
  - Essentially, the RP represents the amount of spread contained in statutory reserves that is prefunding expected future defaults.
  - RP varies from 1bp (AAA) to 575bp (Caa3).
- The RP method is more consistent with current methods for statutory reserve requirements.
  - Current formulaic statutory reserving requirements discount future cash flows at a prescribed default rate; these formulaic requirements are further tested for adequacy using cash flow testing models with current, company-specific assumptions. Many companies quantify future defaults as a level bp charge, where the level might vary by the portfolio.



# Key Modeling Assumptions (cont.)

- In the current C1 factors, the basic AVR factors were used as the risk premium.



# Changes from December 2013 Results

- Extensive review of projection methodology
- Use of RP Method vs. Loss Distribution Method for calculating C1 factor
- Updated discount rate
- Time horizon



# C1 Results as of March 29, 2014

## BT, direct model output

	NAIC Rating	Senior Secured	Senior Unsecured	Senior Subordinated	Subordinated	Junior Subordinated	Current BT C1
Aaa	1	0.22%	0.29%	0.35%	0.37%	0.39%	0.40%
Aa1	1	0.23%	0.29%	0.35%	0.35%	0.39%	0.40%
Aa2	1	0.67%	0.79%	0.97%	0.99%	1.13%	0.40%
Aa3	1	0.60%	0.71%	0.83%	0.86%	1.01%	0.40%
A1	1	0.94%	1.11%	1.36%	1.37%	1.56%	0.40%
A2	1	1.15%	1.35%	1.65%	1.63%	1.91%	0.40%
A3	1	1.11%	1.29%	1.56%	1.57%	1.80%	0.40%
Baa1	2	1.07%	1.21%	1.48%	1.49%	1.72%	1.30%
Baa2	2	1.51%	1.72%	2.05%	2.09%	2.44%	1.30%
Baa3	2	1.99%	2.24%	2.70%	2.67%	3.21%	1.30%



# C1 Results as of March 29, 2014

## BT, direct model output (cont.)

	NAIC Rating	Senior Secured	Senior Unsecured	Senior Subordinated	Subordinated	Junior Subordinated	Current BT C1
Ba1	3	3.17%	3.60%	4.38%	4.28%	5.18%	4.60%
Ba2	3	3.22%	3.61%	4.42%	4.25%	5.29%	4.60%
Ba3	3	5.90%	6.40%	8.03%	7.65%	9.83%	4.60%
B1	4	5.51%	5.94%	7.29%	6.98%	8.72%	10.00%
B2	4	6.11%	7.04%	8.71%	8.44%	10.48%	10.00%
B3	4	8.68%	9.81%	12.17%	11.74%	14.50%	10.00%
Caa1	5	20.17%	22.83%	28.80%	27.33%	35.66%	23.00%
Caa2	5	19.32%	21.64%	26.94%	25.47%	33.28%	23.00%
Caa3	5	28.59%	32.96%	41.50%	44.89%	51.31%	23.00%



# Observations on Results

- Results are pre-tax, based on a statistical confidence level at the 92<sup>nd</sup> percentile over a ten year time horizon; 5% BT discount rate.
- Results are presented for the largest matrix of factors: 19 rating classes\* and five instrument types.
- Most valid results are senior unsecured as these results do not yet reflect notching.

\* Securities near or in default will also be a rating class. This analysis considers securities in NAIC Classes 1-5.



# Recommended C1 Matrix

- Based on C1 modeling, the Academy's C1WG recommends use of a 13 X 3 matrix
  - 13 NAIC Classes to replace NAIC 1-5
  - 3 collateral types
- Recommendation accommodates IRBC WG's desire to limit investment grade to six classes and other classes to a +/- scheme (e.g., 3+/-, 4+/-, 5+/-, 6+/-).
- Industry testing can show how the average C1 charge varies by classification scheme.



# Recommended Instrument Types

Based on C1 results and distribution of industry holdings, the C1WG recommends using 3 instrument types:

- Senior Secured (16% of industry holdings)
- Senior Unsecured (78% of industry holdings)
- Subordinated (all subordinated types) (6% of industry holdings)



# Recommended Bond Classes

	Current NAIC	Proposed
Aaa	1	1
Aa1	1	1
Aa2	1	2
Aa3	1	2
A1	1	3
A2	1	3
A3	1	3
Baa1	2	4
Baa2	2	5
Baa3	2	6



# Recommended Bond Classes

	Current NAIC	Proposed
Ba1	3	7
Ba2	3	8
Ba3	3	9
B1	4	10
B2	4	11
B3	4	12
Caa1	5	13
Caa2	5	13
Caa3	5	13



# Major Items to be Reviewed During Q2 by C1WG

- Additional changes to results
  - Impact of notching; results do not reflect notching yet (time constraint)
  - Others, as identified in the review
- Analysis of vector vs. matrix approach
  - Are results logical?
  - Are differences material?
- Smoothing for inconsistencies, anomalies
- Sensitivity testing of material assumptions
- Finalize base C1 factors for regulator review & industry testing



# Major 2014 Tasks for Academy's C1WG

- Recommend changes to AVR consistent with C1 bond factor recommendations
- Work with regulators and industry to test the impact of recommendations
- Develop adjustments to base C1 factors for portfolio variations (e.g., number of issuers, size distribution); determine statistical coverage for C1 at a portfolio level (e.g., 95<sup>th</sup> percentile)
- Document assumptions and modeling process



# Major 2014 Tasks for Academy's C1WG

## (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
  - Bonds in or near default (current NAIC 6 bonds)
- 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 IRBC Work Group

- Decide on structure of C1 charges (requested May 1, 2014)
  - 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 (Note: C1WG has recommended 10 years)
  - Risk metric (Note: C1WG has recommended percentile until covariance within aggregate RBC formula is reviewed.)
  - Statistical level (e.g., 92<sup>nd</sup> percentile)
  - Consistency among asset classes, RBC formulas
- Decide on the degree of consistency between Life, Health, and P&C Blanks and RBC formulas



# Questions

For more information, please contact:

Nancy Bennett, Academy Senior Life Fellow  
[bennett@actuary.org](mailto:bennett@actuary.org)

John Meetz, Academy Life Policy Analyst  
[meetz@actuary.org](mailto:meetz@actuary.org)  
(202) 223-8196

