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# Recommended C-1 Factors for Corporate Bonds

Presentation to the NAIC Investment Risk-based Capital Working Group

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# Agenda

- Methodology for Calculating C1 Factors
- Recommended factors
  - C1 Factors for Corporate Bonds
  - Summary of Major Assumptions
- Explanation of Changes from Current Factors
  - Numerical Explanation
  - Observations
- Next Steps for C1WG

# Conceptual C1 Methodology

- C1 factors are based on a model of projected bond losses.
- This model contains assumptions that are based on historical experience and reflects behavior that does not change over time.
  - Assumptions must be representative of the entire industry and applied to each company, regardless of the company's investment risks.
  - Assumptions are consistent with a ten-year time horizon and attempt to capture changes over that horizon.
  - Passive strategies are modeled; while passive strategies are not followed by most life insurers, modeling active strategies would not be possible.
- In reality, a bond portfolio would be actively managed reflecting sector, duration and other allocations; individual security decisions would vary with company needs and market conditions.

# Calculating Base C1 Factors

- The C1 capital charges are derived from a simulation model where the cash flows for a sub-portfolio of bonds are projected assuming different economic scenarios.
- 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).
- 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 <u>at any point throughout the modeling period – not just at the end of ten years.</u>
  - Requiring capital to pre-fund the greatest loss is more conservative than pre-funding the cumulative losses over ten years.
  - Present value calculated at 5% before tax (BT)/3.25% after tax (AT).

# Calculating Base C1 Factors (cont.)

- 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
- Required capital amount for each simulation is divided by beginning assets to get a required capital factor
  - Recommended C1 charges shown represent a $92^{nd}$ percentile, 10-year time horizon safety level for an individual security.
  - The statistical safety level for a portfolio will be tested; Expected to fall in the $95^{th}$ - $96^{th}$%

# General Comments on C1 Methodology

- The 2015 recommended factors are based on the same basic methodology as the 2002 factors, with the following exceptions:
  - Recovery rates are modeled differently, reflecting more complete experience about recoveries.
  - Reinvestment in full amount vs. salvage value
- The 2015 recommended factors reflect historical experience with no attempt to favor one type of asset over another.
- Certain assumptions and the basic structure of the C1 factors have been prescribed by the NAIC's IRBC WG (e.g., statistical safety level – 92 percentile/10-year, reliance on Nationally Recognized Statistical Rating Organization (NRSRO) rating, number of factors)

# Recommended C1 Factors
## Compressed, Before Tax

| | 2015 RECOMMENDED BT COMPRESSED | CURRENT NAIC BT |
|---|---|---|
| Aaa | 0.34% | 0.40% |
| Aa1 | 0.34% | 0.40% |
| Aa2 | 0.72% | 0.40% |
| Aa3 | 0.72% | 0.40% |
| A1 | 1.16% | 0.40% |
| A2 | 1.16% | 0.40% |
| A3 | 1.16% | 0.40% |
| Baa1 | 1.49% | 1.30% |
| Baa2 | 1.68% | 1.30% |
| Baa3 | 2.01% | 1.30% |

# Recommended C1 Factors

## Compressed, Before Tax (cont.)

| | 2015 RECOMMENDED BT COMPRESSED | CURRENT NAIC BT |
|---|---|---|
| Ba1 | 3.55% | 4.60% |
| Ba2 | 4.39% | 4.60% |
| Ba3 | 5.62% | 4.60% |
| B1 | 5.99% | 10.00% |
| B2 | 7.86% | 10.00% |
| B3 | 10.31% | 10.00% |
| Caa1 | 17.31% | 23.00% |
| Caa2 | 17.31% | 23.00% |
| Caa3 | 17.31% | 23.00% |

# Additional Recommendations

- C1 factor for bonds in or near default = 30% (no change from current factor)
- C1 factors for fixed income assets other than public corporate bonds use the corporate bond factors (e.g., municipals, sovereigns, private placements/144a, hybrids, etc.)

# 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.
- Expected default and recovery rates are adjusted for the economic condition (e.g., recession, expansion) as simulated in each economic scenario.
- Model was run over 10,000 random economic simulations.

# Key Modeling Assumptions (cont.)

- Discount rate updated from 6.0% AT to 3.25% AT
- Corporate tax rate and timing of loss recognition, updated for current data, reflecting revised 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 number of issuers, issuer size distribution.
  - 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.

*Committee on Uniform Security Identification Procedures numerical identifier

# 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 509bp (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 discount 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.

# Estimated Impact on C1

- On an after-tax basis, the average industry C1 charge for bonds, before covariance and before any adjustments for the number of portfolio issuers or concentration increased from 0.84% to 1.12%.
- On a before-tax basis, the average industry C1 charge for bonds, before covariance and before any adjustments for the number of portfolio issuers or concentration increased from 1.16% to 1.56%.
- Individual company results will vary, particularly for weakly capitalized companies.

# Explanation of Changes from Current Factors

- Discount rate: 6.0% AT to 3.25% AT
- Default experience
  - increases the factors slightly for investment grade ratings
  - decreases the factors for below investment grade ratings
  - impact is explained by the combination of the baseline rates and the modifications for economic conditions throughout the modeled scenario.
- Recovery methodology
  - based on historical experience for recoveries of senior unsecured bonds
  - reflects more complete data about recoveries, as compared to the available information in the early 1990’s and in 2002
  - reflects lower recovery experience for investment grade securities, particularly in the tails of the distribution.
- The “Other” differences include factor differences due to portfolio structure, granularity, and rounding.

# Numerical Comparison: Recommended to Current

| | | 2002 Pre-tax C1 | Discount Rate | Default | Recovery | Other | Total Change | 2015 Pre-tax C1 |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| | Aaa | 0.40% | 0.05% | (0.04%) | 0.11% | (0.24%) | (0.12%) | 0.28% |
| | Aa | 0.40% | 0.09% | (0.08%) | 0.23% | 0.03% | 0.27% | 0.67% |
| | A | 0.40% | 0.15% | 0.03% | 0.25% | 0.33% | 0.76% | 1.16% |
| ***NAIC 1*** | Aaa-A | 0.40% | 0.11% | (0.02%) | 0.21% | 0.12% | 0.42% | 0.82% |
| ***NAIC 2*** | Baa | 1.30% | 0.21% | 0.06% | 0.20% | (0.10%) | 0.37% | 1.67% |
| ***NAIC 3*** | Ba | 4.60% | 0.52% | (0.23%) | (0.65%) | 0.05% | (0.31%) | 4.29% |
| ***NAIC 4*** | B | 10.00% | 0.84% | (2.35%) | (2.56%) | 1.64% | (2.43%) | 7.57% |
| ***NAIC 5*** | Caa | 23.00% | 1.41% | (6.76%) | (5.01%) | 4.67% | (5.69%) | 17.31% |

# Major C1WG Q4 Items

- Respond to regulator and interested party questions
- Evaluate possible adjustments to the base C1 factors
  - Concentration
  - Number of issuers
  - Other
- Begin review of structured securities capital requirements

# Questions

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