

By Anne Oberstadt, CIPR Senior Researcher

◆ INTRODUCTION

The NAIC is exploring the implementation of a new and more granular risk-based capital (RBC) structure for fixed income asset capital charges by 2019. The changes represent the first of their kind since the current asset capital charges were developed more than two decades ago.¹ If implemented, the new structure will expand the fixed income designations from six to 20 categories and revise the factor values. The expanded factors are intended to add more transparency to the varying degrees of risk within insurers' fixed-income securities. This will allow the capital charges for these investments to better reflect the capital needed over a 10-year time horizon. This article explores how the RBC bond factors may change for life insurers. It will also discuss the potential implications of these changes for life insurers.

◆ WHAT IS RBC?

The purpose of RBC is to help state insurance regulators identify weakly capitalized companies. It is a method of determining the minimum amount of capital an insurer should hold based on its risk profile. This amount is what is needed beyond what is held in policy reserves to offset future excess losses to statutory capital. Amounts below this threshold would require incremental levels of regulatory action, up to mandatory intervention. There are four levels of action an insurer can trigger if they fall under the threshold: mandated company action level; regulatory action level; authorized control level; and mandatory control level. More on these action levels is discussed below.

◆ LIFE RBC FORMULA STEPS

Step 1: Generate RBC Required Capital Amounts

The RBC required capital is the level of capital estimated to be needed to support the risks of the insurer. The life RBC formula uses the book/adjusted carrying value (BACV) amounts for the included risk items from insurer's annual financial statements.² The BACV amounts are then multiplied by RBC risk factors to generate the RBC required capital.

The following is the formula for the RBC required capital:

$$\text{BACV} * \text{factor} = \text{RBC required capital}$$

Step 2: Segregate into Risk Components

The individual RBC required capital results are then summed and separated into risk components based on statistical correlation. Figure 1 illustrates these risk components for the life RBC formula.

**FIGURE 1:
LIFE RBC RISK COMPONENTS**

C-0:	Aggregates most affiliate investment and (non-derivative) off-balance sheet risk
C-1cs:	Aggregates unaffiliated invested common stock asset risk
C-1o:	Aggregates fixed income asset & reinsurance credit risk (bonds, preferred stock)
C-2:	Insurance risk
C-3a:	Interest rate risk
C-3b:	Health credit risk
C-3c:	Market risk
C-4a:	Business risk – guaranty fund assessment and separate account risks
C-4b:	Business risk – health administrative expense risk

Step 3: Adjust the Risk Components for Taxes

After the base elements are combined into risk components, a tax adjustment is applied to most of the risk components before covariance. The tax amount used varies based on the base elements. It ranges from 26.25% to 35%.

Step 4: Apply Covariance Formula

The covariance formula is then applied to the values calculated for each category. This adjusts for the improbability all risks will materialize simultaneously.³ The adjustment excludes affiliated equity investment risk and off-balance sheet risk (i.e., C-0 amounts).

Step 5: Generate Total RBC after Covariance

The results of the covariance formula produce the Total RBC after Covariance capital requirement. The authorized control level is half of this requirement.

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¹ It should be noted asset risk is only one of several risk components involved in the RBC calculations.

² The BACV is the statutory value of the investment before nonadmitted amounts based on the appropriate *Statement of Statutory Accounting Principle (SSAP) SSAP No. 26—Bonds* requires a life insurer's designation 1 through designation 5 bonds to be valued at amortized cost; designation 6 bonds are valued at the lower of amortized cost or fair value.

³ NAIC. Life Risk-Based Capital Summary: Interactions between the Classification Decision, Annual Statement Reporting, and Life RBC Requirements. Retrieved from www.naic.org/documents/topics_hybrid_lrbc_hybrid_summary.pdf.

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The Total RBC after Covariance formula is as follows:

$$\text{Company Action Level RBC} = C0 + [(C1o + C3a)^2 + (C1cs + C3c)^2 + (C2)^2 + (C3b)^2 + (C4b)^2]^{1/2} + C4a$$

Step 6: Calculate RBC Ratio

An insurer's total adjusted capital is then assessed against the formula results to develop the RBC ratio.⁴

The RBC ratio formula is as follows:

$$\text{RBC Ratio} = \frac{\text{Total Adjusted Capital}}{\text{Authorized Control Level RBC}}$$

The RBC ratio is used to determine if an insurer's surplus level meets the minimum threshold to avoid company or regulatory action. If the ratio is 150% to 200%, the company must provide an RBC plan. If the ratio is 70% to 100%, the insurance regulator may take control of the insurer. If the ratio is below 70%, the regulator is required to place the insurer under control.

◆ WHY UPDATE?

The NAIC RBC system was placed into effect in 1991 after a series of insurer insolvencies. Over the years, some of the risk factors have been slightly modified and some structural changes have been made. However, the original factors are based on historical information from the 1970s and 1980s. Economic and interest rate conditions over the past decade have been considerably different than those during the development of the original RBC factors. Additionally, loss severity data has become more complete. Computer modeling capabilities have also become more sophisticated.

◆ C-1 REVIEW REVEALS REVISIONS NEEDED

In 2011, the NAIC began an initiative to review the current asset (C-1) risk structure and factors used in the RBC model.

Figure 2 illustrates how RBC asset capital charge (C-1) factors reflect the risk of default and fluctuations in fair value of investments due to changes in interest rate. Thus, the C-1 component protects statutory surplus from events like bond defaults or common stock depreciation.

Asset risk heavily impacts the capital adequacy of life insurers. Bonds represent more than 75% of life insurers' invested assets. As such, the review process has included the treatment of fixed-income assets in the life RBC formula. The American Academy of Actuaries (Academy) has supported the examination process by providing statistical modeling support. This is consistent with the development of the original RBC factors.

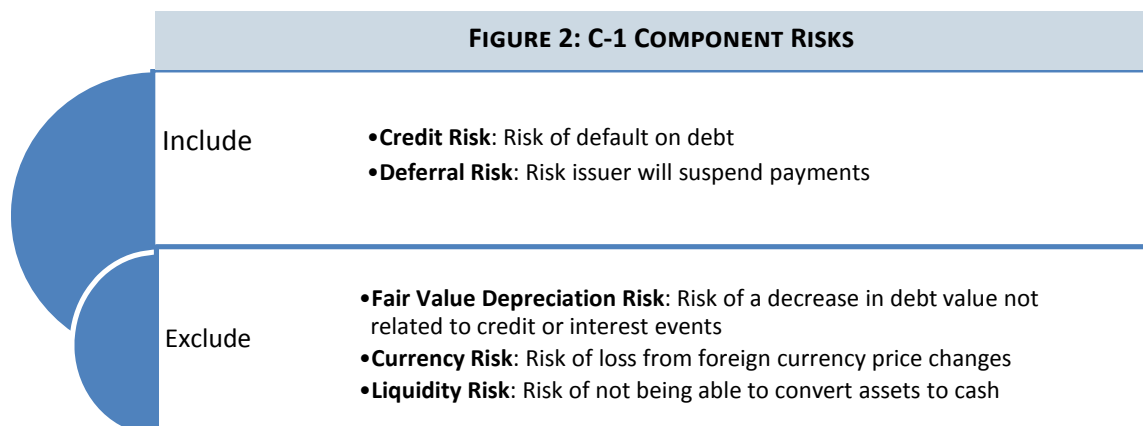
As before, the Academy modeled historical default probability and loss recovery experience of public corporate bonds. The model derives C-1 capital charges from an industry representative bond portfolio. Losses are projected over 10 years assuming different economic conditions more than 10,000 economic scenarios and using a 96% confidence level. Default rate data and loss severities were provided by the nationally recognized statistical rating organizations (NRSROs). The Academy has proposed revisions to the structure and factors of the life RBC formula based on its analysis of the modeling results.

◆ PROPOSAL TO INCREASE C-1 BOND FACTOR GRANULARITY

The Academy recommended adding granularity in the life RBC formula by expanding the C-1 bond risk factors. Noting the Academy's data justified the need for additional granularity, the NAIC proposed expanding the factors from six to 20 designation categories. The 20 designation categories

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⁴Total Adjusted Capital = statutory capital and surplus + asset valuation reserve (AVR) + half of the liability for dividends + ownership share of AVR of subsidiaries + half of ownership share of subsidiaries' dividend liability.



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reflect NRSRO grades, although some grades will have the same factors.

The Academy's analysis found the current structure did not sufficiently align capital charges with varying degrees of credit quality relative to NRSRO letter ratings. Increasing the granularity of bond risk factors would allow RBC charges to more precisely map to capital needs for each RBC rating category. It will also allow state insurance regulators a more transparent view of insurers' credit risks. Figure 3 summarizes the benefits of adding granularity to the C-1 bond factor structure.

The current C-1 charges are based on the six NAIC designations. NAIC 1 and 2 classes are considered investment grade. There are seven Moody's bond categories in the NAIC 1 designation. The current RBC factors were developed under the assumption 25% of the bond holdings were in Aaa-rated bonds. However, both the market and insurers' investment holdings have changed significantly since RBC was first developed. Recent analysis by the NAIC shows insurer bond holdings include only about 5% in the Aaa-rated category.

The Academy's analysis noted life insurers' bonds were concentrated in the lower stratus of each NAIC designation. Besides market availability, it is also likely because a lower quality bond receives the same RBC charge as a higher quality bond, if it is assigned the same NAIC designation. For example, as seen in Figure 4, Moody's Aaa and A3 rated bonds both receive NAIC 1 designations. As such, they receive the same RBC charge, despite being six rating categories apart. Additionally, the charge for Baa1 rated bonds jumps to 1.5%, despite being only one rating category apart from A3 rated bonds. Increasing the granularity will reduce these "cliffs." This should eliminate the incentives created by having the same capital charge for bonds with substantially different risk profiles.

The 20 designations are anticipated to be applicable for RBC purposes only. The current six designation structure would continue to exist for investment law and statutory accounting purposes. The expanded designations are proposed to become part of a new required electronic-only column. The column will be part of Schedule D of the annual financial statement and feed into the RBC calculation. The proposal maps the new RBC designations directly to each asset's NRSRO bond rating.

The NAIC Investment Analysis Office has a separate, but related, proposal for bonds for which it assigns designations. The proposal modifies the NAIC designation by including a letter from A through G while also flowing through the

FIGURE 3: WHY ADD GRANULARITY?

- ✓ Eliminate NAIC designation "cliffs."
- ✓ Align more precisely with risks.
- ✓ Provide accurate asset distributions.

traditional NAIC designation hierarchy. The results would be captured in a new NAIC designation category.⁵ Figure 5 on the following page illustrates this relationship for NAIC designation 1 bonds.

◆ PROPOSAL TO UPDATE C-1 BOND FACTORS

The factor values for the 20 C-1 bond designations will be based on the analysis performed by the Academy in its modeling of corporate bonds. The Academy's most current proposal for base bond factors for life insurers is illustrated in Figure 6. The proposed factors provide lower capital charges for five NRSRO ratings. All but one of these changes is to below investment grade bonds. The factor for bonds in or near default remains unchanged. The remaining 14 NRSRO ratings receive higher charges. Overall, the proposed bond factors are expected to increase the RBC required capital for most insurers. However, it is important to recognize other changes could significantly reduce requirements for assets such as mortgage loans, real estate and receivables. These changes could also impact the proportion of capital required from bond investments versus other components of the life RBC formula.

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**FIGURE 4:
BOND GRANULARITY EXAMPLE**

Current Designation	Current Factor	Bond Rating
NAIC 1	.40%	Aaa
		Aa1
		Aa2
		Aa3
		A1
		A2
		A3

⁵ Carcano, B., Therriault, C. and Kolchinsky, C. (March 24, 2017). Comment of the Investment Analysis Office (IAO) on the Investment Risk-Based Capital (E) Working Group Proposal for Life Bond Granularity and Related Issues [Memorandum]. NAIC Valuation of Securities (E) Task Force. www.naic.org/documents/cnte_e_vos_exposure_iao_rep_irbcwq_life_bond_granularity.pdf.

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**FIGURE 5:
NAIC DESIGNATION CATEGORY EXAMPLE**

NAIC Designation +	Designation Modifier =	NAIC Designation Category
NAIC 1	A	1.A
	B	1.B
	C	1.C
	D	1.D
	E	1.E
	F	1.F
	G	1.G

The increase in investment grade bond factors reflects data showing that losses on investment grade bonds have been higher over the past two decades than what was assumed in the current factors. Meanwhile, the decrease in charges for noninvestment grade bonds is lower, despite increased default rates for most of these bond classes. Another significant driver is a decrease in the discount rate to 3.5% after tax from 6% after tax, reflecting substantially lower interest rates from the late 1980s. The discount rate is based on the 10-year London Interbank Offered Rate (LIBOR) swap rate averaged over the past 20 years.⁶

◆ PROPOSAL FOR FACTOR ADJUSTMENTS

The current RBC formula contains portfolio adjustments for the 10 largest issuers in an insurer's asset portfolio (asset concentration) and for the size of the bond portfolio. The asset concentration factor reflects the additional risk of high concentrations in single exposures. The bond size factor reflects the higher risk of a bond portfolio containing relatively fewer bonds. The purpose of the portfolio adjustment is to scale the base factors from the 92nd percentile to achieve a safety level in 96th percentile and to include a diversification adjustment.

The Academy's October 2017 proposed base factors use an expanded number of securities in its representative portfolio. The expanded portfolio included 824 bonds designated as NAIC 1 or NAIC 2 to better reflect the average credit risk of a life insurer's bond portfolio. The resulting additional diversification in the base factors brings the results to the desired 96th percentile. This eliminates the need to scale results up to a higher safety level.

As a result, the Academy revised the portfolio adjustment scheme to reflect only an individual portfolio's diversifica-

tion relative to the representative portfolio. For individual portfolios with the same number of bonds as the representative portfolio, the portfolio adjustment will be neutral (1.0). This update is not expected to change the average C-1 requirement across the life industry. Figure 7 on the following page compares the current portfolio adjustment factors with the Academy's most current recommended adjustment factors.⁸

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**FIGURE 6:
PROPOSED LIFE RBC BOND CAPITAL FACTORS⁷
(BEFORE TAX)**

NAIC Designation	NRSRO Rating	NAIC Proposed Designation Category	Current Factors	Academy Proposed Factors – Oct. 2017
1	Aaa	1.A	0.40%	0.31%
1	Aa1	1.B	0.40%	0.43%
1	Aa2	1.C	0.40%	0.57%
1	Aa3	1.D	0.40%	0.72%
1	A1	1.E	0.40%	0.86%
1	A2	1.F	0.40%	1.06%
1	A3	1.G	0.40%	1.24%
2	Baa1	2.A	1.30%	1.42%
2	Baa2	2.B	1.30%	1.69%
2	Baa3	2.C	1.30%	2.00%
3	Ba1	3.A	4.60%	3.75%
3	Ba2	3.B	4.60%	4.76%
3	Ba3	3.C	4.60%	6.16%
4	B1	4.A	10.00%	6.35%
4	B2	4.B	10.00%	8.54%
4	B3	4.C	10.00%	11.82%
5	Caa1	5.A	23.00%	17.31%
5	Caa2	5.B	23.00%	23.22%
5	Caa3	5.C	23.00%	30.00%
6	Default	6	30.00%	30.00%

⁶American Academy of Actuaries, C-1 Working Group. (August 3, 2015). Model Construction and Development of RBC Factors for Fixed Income Securities for the NAIC's Life Risk-Based Capital Formula. Retrieved from www.actuary.org/files/imce/Academy%20C1WG%20Documentation%20Corp%20Bond%20Factors%2020Aug%203%202015%20Final.pdf.

⁷American Academy of Actuaries, C-1 Working Group. (October 10, 2017). Updated Recommendation of Corporate Bond Risk-Based Capital (RBC) Factors [Letter]. www.naic.org/documents/cmte_e_investment_rbc_wg_exposure_rec_corporate_bond_rbc_factors.pdf.

⁸Ibid.

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**FIGURE 7:
PORTFOLIO ADJUSTMENT FACTORS⁹**

Current		Recommended	
Issuers	Factor	Issuers	Factor
Up to 50	2.5	Up to 10	7.80
Next 50	1.3	Next 90	1.75
Next 300	1.0	Next 100	1.00
Over 400	0.9	Next 300	0.80
		Over 500	0.75

◆ FUTURE CONSIDERATIONS

The NAIC has been working to update its RBC requirements to reflect modern experience and risks since 2011. Its primary focus has been on reviewing the RBC structure and charges related to fixed income securities. The preference is to treat asset risk consistently for all RBC formulas for each of the statement types. This would minimize operational costs for insurers and software vendors. It would also ensure all bonds are treated equally with respect to default risk, regardless of the holder of the investment.

There is general consensus the C-1 factors for fixed income securities should increase from six to 20 in the life, as well as the property/casualty (P/C) and health, RBC formulas. The factors for the expanded rating categories are still being discussed. The NAIC is currently coordinating with the Academy to refine the bond factor values for the life RBC formula. Some hold the opinion different factors should be used for certain asset classes, such as municipal bonds and sovereign debt. The need to update bond factors for health and P/C insurers is also being considered. Health and P/C insurers differ considerably from life insurers in how they hold and use assets. It has been argued efforts to translate the C-1 factors across all lines will require taking these differences into account.

The NAIC plans to implement the revised structure and related factors being developed for investments in each of the RBC formulas for the year-end 2019 reporting purposes. This should provide sufficient time to evaluate the effect of the changes on each industry sector. The expansion of C-1 factors will eliminate the incentive for insurers to invest in lower quality bonds within the same NAIC designation. Insurers may also reconfigure their investment portfolio in light of the changes in capital charges. But most important, the added granularity will add transparency to the credit risks insurers hold in their investments and the updated factors reflect more current data. This should enhance insurance regulators ability to use RBC for its intended purpose: to identify weakly capitalized insurers.

ABOUT THE AUTHOR



Anne Obersteadt is a researcher with the NAIC Center for Insurance Policy and Research. Since 2000, she has been at the NAIC performing financial, statistical and research analysis on all insurance sectors. In her current role, she has authored several articles for the CIPR Newsletter, a CIPR Study on the State of the Life Insurance Industry, organized forums on insurance related issues, and provided support for NAIC working groups. Before joining CIPR, she worked in other NAIC Departments where she published statistical reports, provided insurance guidance and statistical data for external parties, analyzed insurer financial filings for solvency issues, and authored commentaries on the financial performance of the life and property and casualty insurance sectors. Prior to the NAIC, she worked as a commercial loan officer for U.S. Bank. Ms. Obersteadt has a bachelor's degree in business administration and an MBA in finance.

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⁹ Ibid.



NAIC Central Office
Center for Insurance Policy and Research
1100 Walnut Street, Suite 1500
Kansas City, MO 64106-2197
Phone: 816-842-3600
Fax: 816-783-8175

<http://www.naic.org>

<http://cipr.naic.org>

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