TheInfiniteActuary

GH 201-U

Condensed Study Manual

Fall 2025

GROUP INSURANCE, CH. 41 – RISK-BASED CAPITAL FORMULAS

History of RBC Formulas

- Before RBC, regulators used fixed capital standards to monitor solvency of insurers
- 1998 – NAIC adopted RBC formula for health organizations
- RBC formula that applies to the insurer (health or life) depends on which statement blank that the insurer files
    - "Health Blank Test" determines which blank is appropriate for insurer to file – added in 2003
        - Health premiums and reserves are compared to total premiums and reserves
            - If ratio is greater than 95% for current and prior year, insurer uses Health Blank

NAIC RBC Model Acts

- Level of action depends on the ratio of insurance company's actual capital to their required capital (based on the risk-based capital formula)
- Compare Total Adjusted Capital (TAC) to Authorized Control Level (ACL) capital requirement
- Regulatory action levels:

TAC-to-ACL Ratio	Regulatory Action
≥ 200%	None
150% to 200%	Company Action Level
100% to 150%	Regulatory Action Level
70% to 100%	Authorized Control Level
< 70%	Mandatory Control Level

    - *Company Action* – submit corrective action plan
    - *Regulatory Action* – submit corrective action plan and Commissioner may issue an order specifying corrective actions
    - *Authorized Control* – Commissioner may place company under regulatory control
    - *Mandatory Control* – Commissioner must take regulatory control of the company
- "Trend Test" – 2009 – if TAC/ACL is between 200%-300% and they have a combined ratio greater than 105%, could trigger a Company Action Level Event (same action as if in 150%-200% range)
    - *[Text doesn't define Combined Ratio, but it is generally (Losses plus Expenses) / Premiums]*
- Reasons why it influences states that haven't adopted the model act:
    1. All companies filing an Orange blank (medical) must calculate Health RBC for annual statement
    2. Regulators are familiar with the RBC concept and express concerns when TAC/ACL ratio is below 200%

3. Quasi-regulatory agencies like Blue Cross/Blue Shield have embraced Health RBC ratios and may require these levels from companies associated with them

Health RBC Formula

- Defines capital requirement based on key factors such as types of products sold by the insurance company, health plan performance and loss ratios, reimbursement methods to providers and types of assets held
    - Designed to identify financially weak companies, not to be a measure of relative financial strength of companies
- RBC ratios that are too high may be perceived as hoarding reserves and likely charging prices that are too high
- Best range for reasonable reserve levels and ratio is decided by company's directors and management

Calculation of RBC After Covariance (RBCAC)

- $RBCAC\ Before\ Operational\ Risk = H_0 + \sqrt{(\ H_1^2 + H_2^2 + H_3^2 + H_4^2\ )}$
    - H_0 – Insurance Affiliates and Misc. Other Amounts
    - H_1 – Asset Risk for Other Assets
    - H_2 – Underwriting Risk
    - H_3 – Credit Risk
    - H_4 – Business Risk
    - $Operational\ Risk$ – 3% add-on *(on total amount calculated)*
- Authorized Control Level (ACL) = RBCAC / 2 (using the RBCAC including operational risk)
- For most health companies, H_2 dominates the formula

Underwriting Risk (H_2)

- Reflects risk of underestimating the cost of insurance or inadequate premiums in the future
- Calculated separately for each health insurance product by applying a risk factor against some measure of exposure
- Risk factors are generally common across all companies, with two exceptions:
    - Factors are tiered by size
    - Factors are adjusted to reflect the nature of the provider reimbursement contracts
- Underwriting risk is divided into Claims Fluctuation Risk and Other Underwriting Risk
- *Claims Fluctuation Risk*
    - Six product groupings:
        - Comprehensive Medical & Hospital
        - Medicare Supplement
        - Dental and Vision
        - Stand-Alone Medicare Part D
        - Other Health – standalone drug products and any other coverage
        - Other Non-Health – Life and Property & Casualty coverages

  - Risk charge = $Premium\ x\ \frac{Incurred\ Claims}{Premium}\ x\ Risk\ Factor\ x\ Managed\ Care\ Risk\ Adjustment\ Factor$
  - Managed Care Risk Adjustment Factor reflects fact that certain contractual reimbursement arrangements lead to greater predictability of claim levels and reduce the need for capital to support fluctuations in experience
  - Claims paid over the previous 12 months are assigned into managed care categories
  - Overall Management Care Risk Adjustment Factor is a weighted average of the factors for each category, where weights are proportions of total claim payments by category
  - Overall factor is then applied to all product groupings EXCEPT Medicare Part D and Other
- *Other Underwriting Risk*
  - Includes health insurance coverages not included in Claim Experience Fluctuation Risk portion and some additional adjustments
    - *Disability Income* – factors are applied to earned premium
      - All individual products are combined and all group products are combined, but individual and group products are not combined with each other
    - *Long Term Care* – Based on three components:
      - Premium
      - Incurred Claims
      - LTC Claims Reserves
    - *Other Coverages* – various factors apply
    - *Rate Guarantees* – when premium rates are guaranteed, the risk of future underwriting losses increases. Factor for guarantees of 15-36 months is 2.4% and 6.4% for longer guarantees
    - *Premium Stabilization Reserves* – underwriting risk is reduced by 50% of the amount of these reserves held

Insurance Affiliates and Misc. Other Risk (H_0)

- Risk that an investment in stock of an affiliated company may lose value
- For investments in affiliates that are also subject to risk-based capital, RBC is calculated on "see-through" basis
- For other investments in affiliates, RBC requirement is 30% times the book value of the stock of those affiliates (for non-US insurance subsidiaries, this factor is 100%)
- Also includes provision for certain off-balance sheet items such as contingent liabilities, non-controlled assets, assets as collateral and guarantees to affiliates

Asset Risk - Other (H_1)

- Risk that investments may default or decrease in value
- Risk-based capital requirement is typically the book/adjusted carrying value of an asset times a factor
  - Factor varies from 0-30%

    - Factor is doubled (but capped at 30%) for certain assets held in the 10 largest securities issuers (reflects concentration risk)
- Some assets (such as reinsurer receivables) are covered in H_3(Credit Risk) or not contemplated in RBC formula
- Groupings:
    - *Cash and Bonds*
    - *Common Stock*
    - *Property & Equipment*

Credit Risk (H_3)

- Risk that amounts owed to the health insurer will not be recovered
- Also calculates possibility that capitated providers won't fulfill contractual obligations

Business Risk (H_4)

- Risk related to several miscellaneous types of general business risks
- *Administrative Expense Risk* – admin expenses are subject to misestimation.
- *Risks from ASC/ASO Business* – risk that insurer may misestimate the amount it charges the customer for admin services
- *Guaranty Fund Assessment Risk* – Factor of 0.5% to premiums subject to state guaranty fund assessments
- *Excessive Growth Risk* – Applies if underwriting RBC increases from one year to the next by more than "safe harbor" level

Operating Risk

- Risk of financial loss resulting from operational events as well as external events
    - E.g. inadequacy or failure of internal systems, personnel, procedures or controls
- Added to Health RBC formula in 2018
- Charge is 3% add-on to the RBC After Covariance Before Operational Risk; reduced by certain offsets

Reserving Risk

- Health RBC doesn't contain capital provision for reserving risk to reflect possibility that insurer's future surplus will be impaired due to unfavorable development in the claims liabilities and reserves as of the valuation date
- Formula implicitly assumes that insurer's claims liabilities are accurately stated
- Two implications of the absence of reserving risk in RBC formula:
    - Implies that insurer's capital requirement is disconnected from the level of conservatism in its actuarial reserves
    - Implies that reserve level would be adequate with high probability to cover the Total Asset Requirement (statutory reserves plus required capital) with no additional risk

Development of the Health RBC Formula

- NAIC requested the American Academy of Actuaries (AAA) to assist in developing a RBC formula for health insurers in 1993
- Group used stochastic "ruin theory" model
- Key factors in the model included:
  - Risk of catastrophic claims and other fluctuations in claim levels
  - Risk of misestimating trends or other pricing errors
  - Length of time needed to recognize a pricing error, implement an adjustment and have that adjustment become effective

Life RBC Formula

- Most companies writing Disability Income, Long Term Care or Group Life file the Blue blank and must use the Life RBC formula
- Life RBC formula is more complex and level of complexity has increased in recent years
- $RBC\ After\ Covariance\ Before\ Operational\ Risk = C_0 + C_{4a} + \sqrt{(C_{1o} + C_{3a})^2 + (C_{1cs} + C_{3c})^2 + C_2^2 + C_{3b}^2 + C_{4b}^2}$
  - C_0 – Asset Risk for Insurance Affiliates and Misc. Other Amounts
  - C_{1cs} – Asset Risk – Unaffiliated common stock and affiliated non-insurance stock
  - C_{1o} – Asset Risk – All other
  - C_2 – Insurance Risk
  - C_{3a} – Interest Rate Risk
  - C_{3b} – Health Credit Risk
  - C_{3c} – Market Risk
  - C_{4a} – Business Risk
  - C_{4b} – Health Administrative Expense component of business risk
  - $Operational\ Risk$ – 3% add-on
- For typical life insurer, risk categories such as Asset Risk and Interest Rate Risk tend to be more important

Comparison of Life, P&C and Health RBC Ratios

- Life
  - $Total\ RBCAC\ Before\ Operational\ Risk = C_0 + C_{4a} + \sqrt{(C_{1o} + C_{3a})^2 + (C_{1cs} + C_{3c})^2 + C_2^2 + C_{3b}^2 + C_{4b}^2}$
    - C_0 – Insurance Affiliates and Misc. Other Amounts
    - C_{1cs} –Asset Risk – Unaffiliated common stock and affiliated non-insurance stock
    - C_{1o} – Asset Risk – All other stock
    - C_2 – Insurance Risk
    - C_{3a} – Interest Rate Risk
    - C_{3b} – Health Credit Risk
    - C_{3c} – Market Risk
    - C_{4a} – Business Risk
    - C_{4b} –Health Administrative Expense Component of Business Risk
    - $Operational\ Risk$ – 3% add-on

- P&C
  - $Total\ RBCAC\ Before\ Operational\ Risk = R_0 + \sqrt{(R_1^2 + R_2^2 + R_3^2 + R_4^2 + R_5^2 + R_{cat}^2)}$
    - R_0 – Affiliated Insurance Companies and Misc. Other Amounts
    - R_1 – Asset Risk – Fixed Income
    - R_2 – Asset Risk – Equity
    - R_3 – Asset Risk – CreditR_4 – Underwriting Risk – Reserves
    - R_5 – Underwriting Risk – Net Written Premium Risk
    - R_{cat} – Catastrophic Risk
    - $Operational\ Risk$− 3% add-on

- Medical
  - $Total\ RBCAC\ Before\ Operational\ Risk = H_0 + \sqrt{(H_1^2 + H_2^2 + H_3^2 + H_4^2}$
    - H_0 – Insurance Affiliates and Misc. Other
    - H_1 – Asset Risk – Other
    - H_2 – Underwriting Risk
    - H_3 – Credit Risk H_4 – Business Risk
    - $Operational\ Risk$− 3% add-on

Conclusion

- Continuous review process helps ensure updates are considered and implemented as appropriate