

RBC Ratios and Impairment Risk: Are they related and, if so, when?

Life Risk-Based Capital (E) Working Group

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BACKGROUND

Key Highlights From Previous Research

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AUTHOR	YEAR	Title	Main Drivers of Impairment
Academy	2010	Property/Casualty Insurance Company Insolvencies	Inadequate loss reserves; inadequate pricing; rapid growth; mismanagement
CAS	2012	A Review of Historical Insurance Company Impairments	Middle-sized companies show highest impairment rates
SOA/CAS/ CIA	2018	Actuarial Review of Insurer Insolvencies and Future Preventions	Premium growth; profitability; liquidity; investment mix; leverage; RBC ratio

Observations about previous studies

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1. Academy and CAS studies included only P&C firms
2. SOA/CAS/CIA study included 76 firms across Life, Health and P&C
3. None of the studies provided quantitative impacts for RBC ratios on the probability of impairment or insolvency
4. None of the studies examined all of the drivers in a multivariate analysis

Other Relevant Research

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Canadian Property and Casualty Insurance Compensation Corporation (PACICC):

- [Global Failed Insurer Catalog](#) (including Life, P&C, Composite, and Reinsurance)
- [Research on Why P&C Insurers Fail](#)

Board of Governors of the Federal Reserve System. Comparing Capital Requirements in Different Regulatory Frameworks (2019). Including a careful analysis of the relationship between RBC ratios and defaults for U.S. Life and P&C insurers.

Definition of Impairment, from AM Best

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"[S]ituations in which a company has been placed, via court order, into conservation, rehabilitation, or insolvent liquidation. Supervisory actions undertaken by state insurance department regulators without court order are not considered impairments, unless there are clear indications that policyholder payments may be delayed or otherwise limited in some manner through the regulatory oversight process."

- AM Best, 2023 US Property/Casualty Impairments Update, Jan. 31, 2025, p1.

Results of matching impairment data with RBC ratio data				
	Companies with RBC data (S&P)	Companies with impairment data (AM Best)	% Matched	% Impaired (total)
P&C	4218	433	87%	10%
Health	2147	105	82%	5%
Life	1805	88	82%	5%
Total	8170	626	86%	8%

1. Downloaded ACL RBC ratios from 1996 to 2023 from S&P Capital IQ Pro for all life, health, and P&C insurance companies that had data for those years
2. Downloaded impairment data from AM Best Impairment Reports for all life, health, and P&C insurance companies that experienced an impairment between 2000 to 2023
3. Matched impairment and ACL RBC ratios using state of domicile and the name of the company because AM Best does not use NAIC codes
4. Results are only for 2011-2023.

Methods

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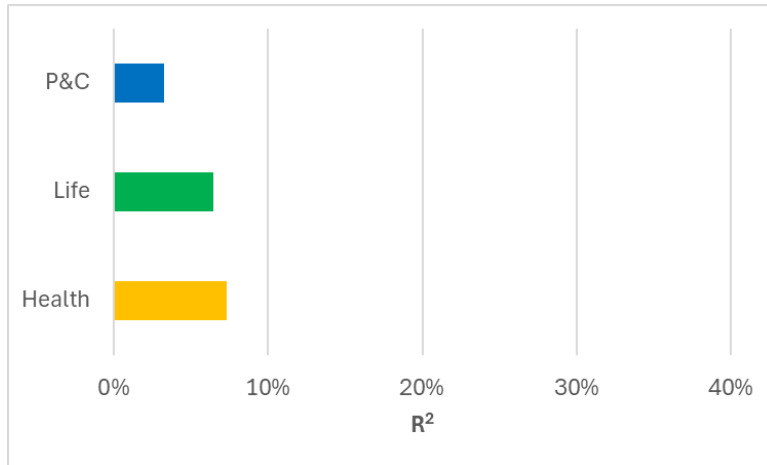
- We assessed whether a meaningful relationship exists by looking at how closely differences in RBC ratios align with differences in the likelihood of impairment. This was done by analyzing max rescaled R-squared (RSQ) values from logistic regressions as an indicator of goodness of fit.
- We selected the “best” sample for each line of insurance by optimizing RSQ and the number of impaired companies in the filtered sample.
- We calculated the estimated probability of impairment by applying the parameters estimated in the logistic regression on the “best” sample to various levels of RBC ratios.

RESULTS

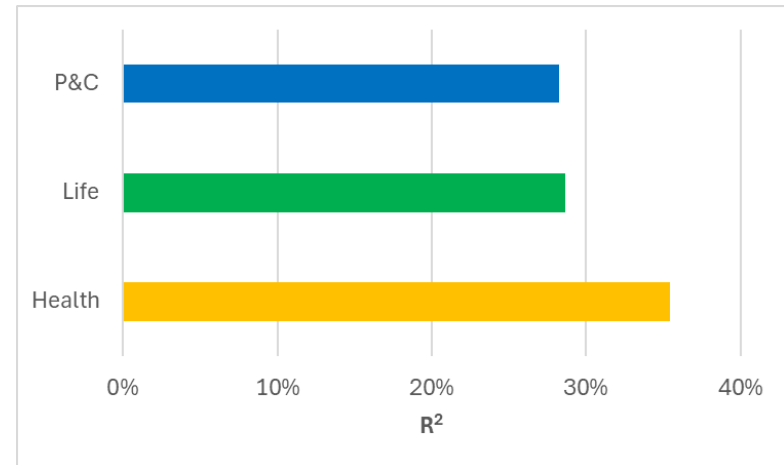
Extent of Variation in Impairments Accounted For by ACL RBC Ratios (R^2), by Line of Business (2011-2023)

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**All Insurers Included:
Little correlation**

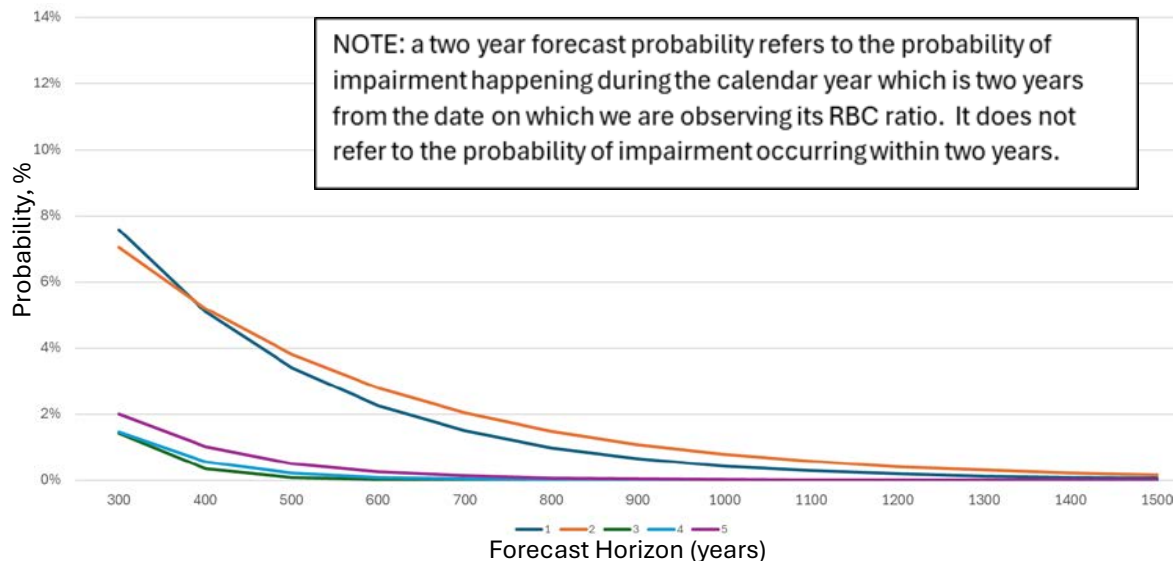


**Large RBC ratios (> 1000%-1500%) and
Small size (smallest 10%)
Insurers Excluded: More correlation**



Life, 2011-2023, Probability of Impairment

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Takeaways

- Probabilities of impairment forecast are much higher in years 1-2 than 3-5
- For RBC ratios of 700+, the probability of impairment is approximately 2% or less for all forecast periods
- With RBC ratios of 1100, all forecast probabilities approach 0

Probability of Impairment by RBC level and Forecast Horizon (years)

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ACL RBC	Life				
	1	2	3	4	5
1500	0%	0%	0%	0%	0%
1400	0%	0%	0%	0%	0%
1300	0%	0%	0%	0%	0%
1200	0%	0%	0%	0%	0%
1100	0%	1%	0%	0%	0%
1000	0%	1%	0%	0%	0%
900	1%	1%	0%	0%	0%
800	1%	1%	0%	0%	0%
700	1%	2%	0%	0%	0%
600	2%	3%	0%	0%	0%
500	3%	4%	0%	0%	1%
400	5%	5%	0%	1%	1%
300	8%	7%	1%	1%	2%
	1	2	3	4	5

Forecast Horizon (years)

Key Takeaways

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- RBC ratios, on their own and across all lines of insurance (P&C, Life and Health) show little meaningful relationship with impairment experience.
- Once we remove very small insurers and companies with extremely high capital levels, a much clearer and more stable predictive pattern emerges.
- In these filtered samples, RBC levels become materially less informative of impairment risk when ACL RBC ratios exceed 1000% - 1500%.

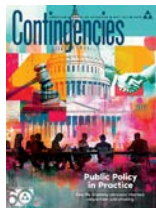
Next steps: In addition to sensitivity testing of the results presented here, the relationship between the RBC ratios and impairment risk when accounting for other factors, which are very likely also related, will be examined.

Other Academy Resources

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Questions?

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