



When Enough is Enough: Leveraging Capital throughout the Life of a Captive

September 21, 2022

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Agenda

- Relevant Actuarial Standards of Practice
- Capital Modeling
 - Background
 - What is enough
- Actuarial Standards of Practice Considerations and Disclosures
- Capital Modeling
 - Other considerations

Actuarial Standards of Practice (ASOP)

ASOP 1

ASOP 23

ASOP 41

Actuarial Standards of Practice (ASOP)

ASOP 7

ASOP 46

ASOP 47

ASOP 55

ASOP 56

When is “Enough” Enough?

- Captive should be capitalized such that the confidence level of maintained solvency is at a high enough level for:
 - Regulators
 - Owner’s risk appetite
 - Potential outstanding liabilities
 - Exposures and limits being insured moving forward
- Pro forma financial exercise can be performed again—additional considerations:
 - IBNR
 - Projected coverages and exposures
 - Trends
- Other stress testing
 - Simulation analysis
 - Tail analysis

Difference Between Capital Modeling and Reserving/Pricing



Holistic View of Risk

- A capital adequacy assessment should incorporate a holistic view of the captive's risks
 - Underwriting Risk
 - Asset Risk
 - Operational Risk
- These risks make up a captive's economic capital
- Correlation within and between classes of risk should be considered with a special focus on tail correlation

Holistic View of Risk

- Underwriting Risk
 - Premiums insufficient to cover losses
 - Adverse development on loss reserves
 - Inflation (social and economic)

Holistic View of Risk

- Asset Risk
 - Bonds
 - Rising interest rates
 - Risk of default (heightened with high-yield bonds)
 - Equities
 - Poorly performing equities
 - Market corrections
 - Liquidity of assets should also be evaluated

Holistic View of Risk

- Operational Risk
 - The risk of loss resulting from ineffective or failed internal processes, people, systems or external events that can disrupt the flow of business operations
 - Embezzlement of captive funds
 - 9/11
 - Great Recession
 - COVID-19
 - Russia/Ukraine conflict

Sensitivity Testing

- Actuarial models are always exposed to the sensitivity of parameter risk
 - Especially true in the tail of the distribution
 - Consider the following example related to underwriting risk:

Sensitivity Testing

<u>Confidence Level</u>	<u>Modeled Losses</u>	<u>Economic Capital</u>
(1)	(2)	(3)
60%	\$1,031,145	\$31,145
70%	1,088,587	88,587
80%	1,159,889	159,889
90%	1,266,567	266,567
95%	1,362,022	362,022
99%	1,560,911	560,911
99.5%	1,640,770	640,770
99.9%	1,818,563	818,563
Expected	\$1,000,000	

Lognormal Parameters

Mu: **13.796**
 Sigma: **0.200**

<u>Confidence Level</u>	<u>Modeled Losses</u>	<u>Economic Capital</u>
(1)	(2)	(3)
60%	\$1,032,039	\$32,039
70%	1,095,453	95,453
80%	1,174,634	174,634
90%	1,294,004	294,004
95%	1,401,675	401,675
99%	1,628,398	628,398
99.5%	1,720,272	720,272
99.9%	1,926,396	926,396
Expected	\$1,000,000	

Lognormal Parameters

Mu: **13.791**
 Sigma: **0.220**

Diversification

- Important to incorporate benefits of diversification throughout the overall risk profile
 - Ignoring this may materially impact the results of the overall capital adequacy assessment
 - Good year would be very good
 - Bad years would overstate the appropriate risk capital threshold
 - For example, there is no plausible link between asset performance and auto physical damage loss costs
 - On the other hand, be on the lookout for tail correlation between risks that would otherwise not be expected to be correlated

Diversification

Confidence Level	Underwriting Economic Capital	Asset Economic Capital	Undiversified Total Economic Capital	Diversified Total Economic Capital
(1)	(2)	(3)	(4) = (2) + (3)	(5)
60%	\$31,145	\$5,606	\$36,751	\$31,238
70%	88,587	15,946	104,532	88,852
80%	159,889	28,780	188,669	160,369
90%	266,567	47,982	314,549	267,367
95%	362,022	65,164	427,187	363,109
99%	560,911	100,964	661,875	562,594
99.5%	640,770	115,339	756,109	642,693
99.9%	818,563	147,341	965,904	821,018

Scenario Testing

- What keeps you up at night?
 - Material rate of default
 - Dramatic rise in interest rates
 - High degree of tail dependency
 - Reinsurance risk
 - Slow paying reinsurer
 - Reinsurer insolvency
 - Be reasonable!
 - CONOP 8888

Scenario Testing



ASOP 7 – Insurer Cash Flows

- Section 3.2: Determining the Level of Analysis of Cash Flows
- Section 3.3: Identification of Assets
- Section 3.4: Projection of Asset Cash Flows
- Section 3.5: Projection of Policy Cash Flows
- Section 3.6: Other Liability Cash Flows
- Section 3.7: Materiality
- Section 3.8: Reinsurance
- Section 3.9: Separate Accounts
- Section 3.10: Modeling and Data
- Section 3.11: Negative Interim Earnings

ASOP 46 – Risk Evaluation in ERM

- Section 3.3.1: Considerations Relating to an Economic Capital Model
- Section 3.3.2: Reliance on Accounting Framework
- Section 3.3.3: Methods
- Section 3.3.4: Assumptions
- Section 3.3.5: Validation of the Economic Capital Model

ASOP 55 – Capital Adequacy Assessment

- Section 3.1: General Considerations
- Section 3.2: Additional General Considerations
- Section 3.3: Valuation Bases Underlying a Capital Adequacy Assessment
- Section 3.4: Risk Capital Target or Risk Capital Threshold
- Section 3.5: Additional Considerations Regarding Risk Capital Target or Risk Capital Threshold
- Section 3.6: Scenario Tests and Stress Tests
- Section 3.7: Incorporating Management actions
- Section 3.8: Insurers that Operate under More than One Regulatory Regime

ASOP 56 – Modeling

- Section 3.1: Modeling Meeting the Intended Purpose
- Section 3.3: Understanding the Model
- Section 3.4: Reliance on Models Developed by Others
- Section 3.5: Reliance on Experts
- Section 3.6: Evaluation and Mitigation of Model Risk
- Section 3.7: Documentation

Additional Considerations

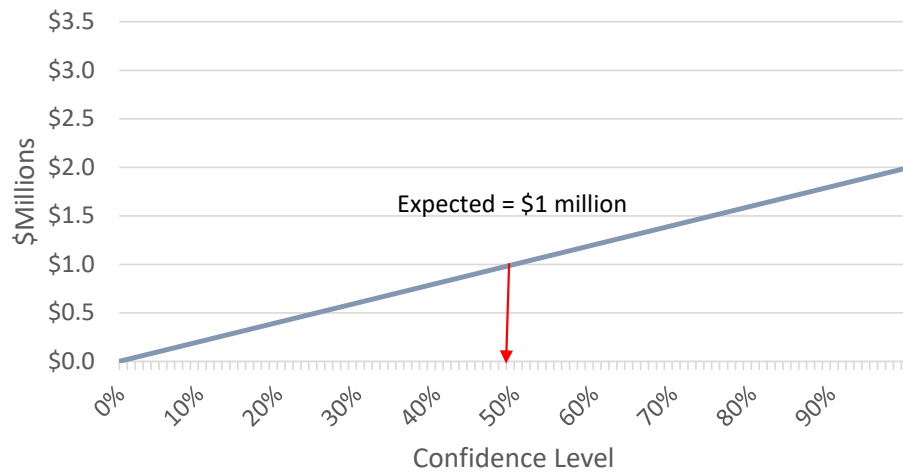
- Time horizon
 - Evaluate capital needs over one year, two years, etc.
- Potential changes over the specified time horizon
 - Has a large dividend already been approved?
 - New exposures introduced?
- What is the minimum level of cash?
 - Plays an important role in liquidity risk

How Much Capital is Enough?

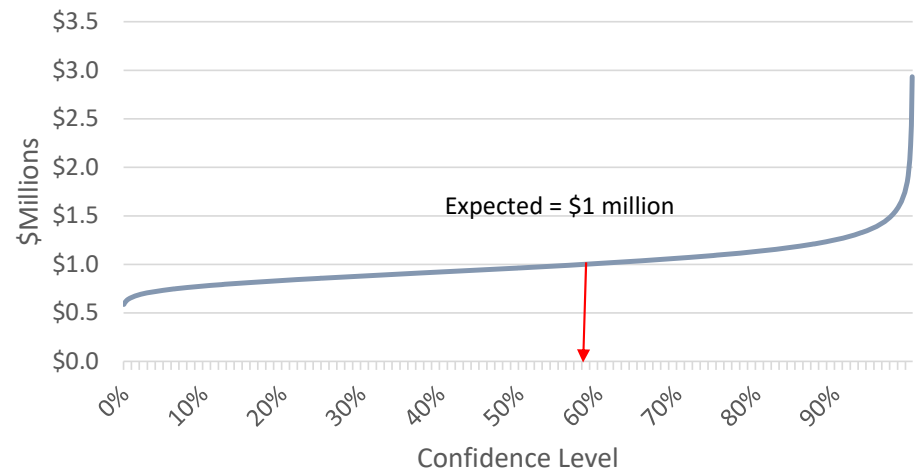
- Rules of thumb
 - Premium to Surplus Ratio
 - Reserve to Surplus Ratio
- Regulatory rules
 - Risk-based capital ratios (RBC)
- Rating agencies
 - A.M. Best's Capital Adequacy Ratio

Comparison of Distribution of Losses

Captive A



Captive B



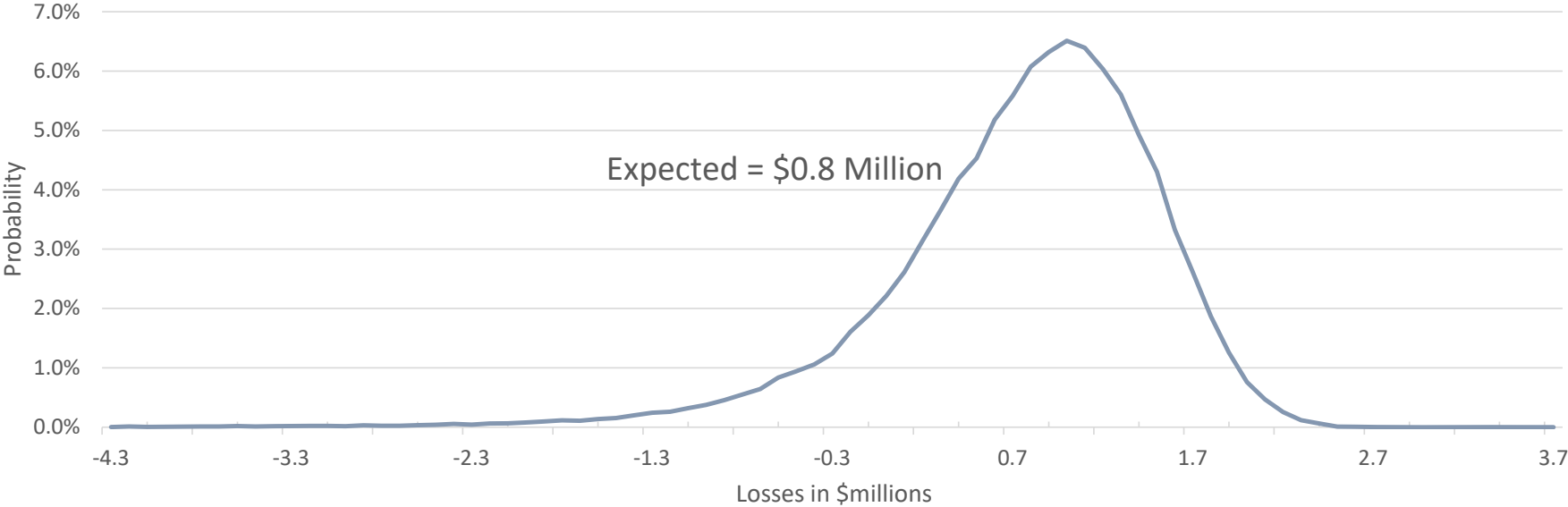
How Much Capital is Enough?

- Depends on the company's risk appetite
 - What probability of insolvency is appropriate for the company's business plan?
 - This is ultimately a decision that can (or should) be made by a Board of Directors
 - Risk appetite should be dynamic and change as the company evolves over time

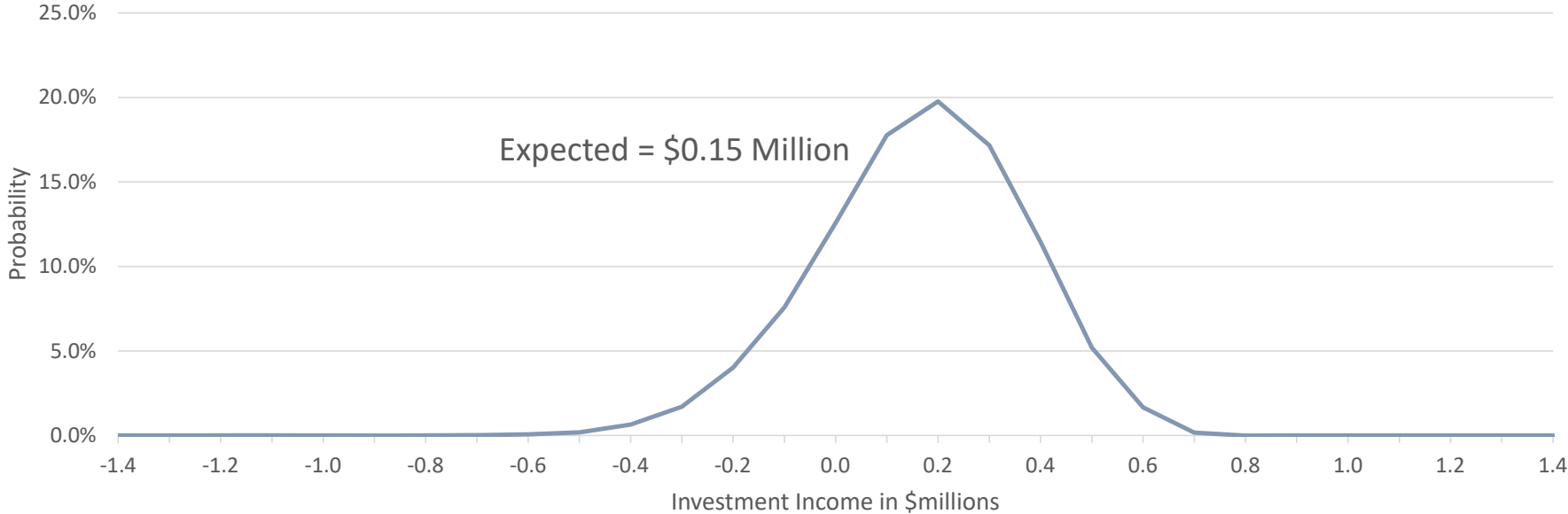
How Much Capital is Enough?

- Benchmarked by probability of insolvency
 - Gives the Board a clear metric that is understandable and easy to explain to others
- For example, let's assume the Captive's Board is incredibly risk averse
 - Board targets a probability of insolvency of 0.01% (i.e., Risk Capital Threshold) over a **two-year time horizon**
 - The company would hold enough capital to support this probability of insolvency—otherwise known as “economic capital”
- Anything beyond this benchmark is considered free capital
 - Can be used to pay dividends, expand limits, introduce new exposures, etc.

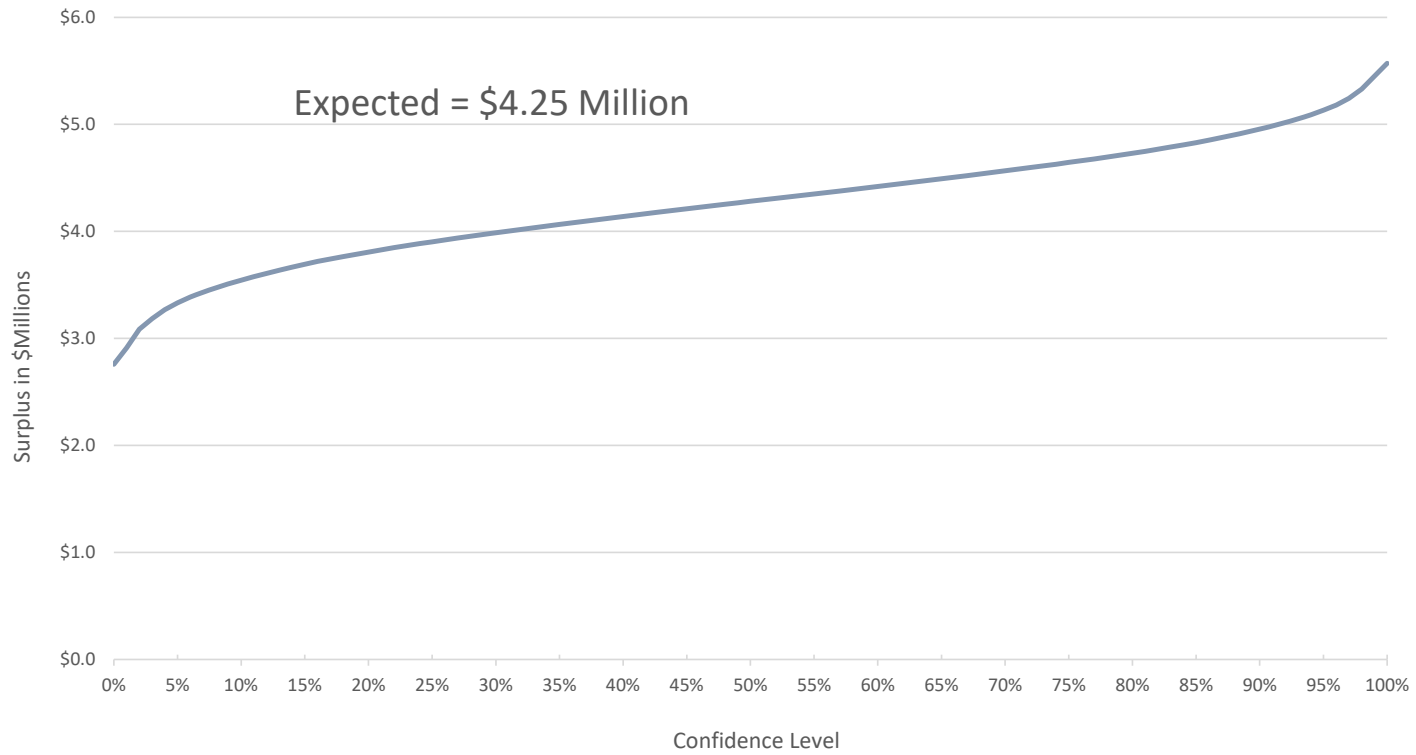
Distribution of Underwriting Results



Distribution of Investment Results



Surplus Range of Outcomes



Surplus Range of Outcomes

Confidence Level	Modeled Capital
(1)	(2)
5.0%	\$3.2
10.0%	3.4
20.0%	3.8
25.0%	3.9
33.1%	4.0
40.0%	4.1
50.0%	4.3
60.0%	4.4
70.0%	4.5
80.0%	4.7
90.0%	4.9
95.0%	5.1

- There is a 33.1% probability that capital will be at most \$4 million in the next year.
- In other words, a 33.1% probability of a call on capital

Evaluation of the Tail

Confidence Level	Modeled Capital	Economic Capital	Free Capital	Total Capital
(1)	(2)	(3)	(4) = (5) - (3)	(5)
0.1%	1 / 1,000	\$4.98	(\$0.98)	\$4.00
0.5%	1 / 200	3.32	0.68	4.00
1.0%	1 / 100	2.07	1.93	4.00
1.5%	1 / 66.7	1.48	2.52	4.00
2.0%	1 / 50	0.99	3.01	4.00

Figures presented in \$millions

Uses of Free Capital

- Issue dividends
- Expand limits
- Introduce new coverages
- Opportunities on the asset side of the balance sheet
 - Non-traditional investments
 - Fine art
 - Bitcoin
- Loan-back to parent
- High-yield bonds

Key Takeaways

- Capital protects captive solvency at a high confidence level
- Initial capital need varies based on regulation and risk appetite
- Captive Boards should create a capital policy statement and review this document at each annual Board meeting
 - Especially if pricing with a risk margin
 - If capital falls out of the specified range of targeted capital, the Board should strongly consider actions that would adjust the capital to appropriate levels

Key Takeaways

- Capital need evolves over time based on exposure and financial results
 - Risks are constantly changing and evolving. Keeping a pulse on threats and opportunities will allow for a higher degree of success long-term
- Although having too much capital is better than not having enough, an overcapitalized captive is using resources inefficiently
- The appropriate amount **will** be different for every captive

The background of the slide features a repeating pattern of white, three-dimensional question marks. These question marks are rendered with soft shadows, giving them a sense of depth and volume. They are scattered across the frame, with some appearing larger and more prominent than others. The overall color palette is a light, warm yellow, which provides a subtle contrast to the white question marks.

Questions

Thank You

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