

# Risk Management Approach

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ASSET MANAGEMENT | WHITE PAPER

## What Gets Measured Gets Managed: Best Practices in Risk Management

By Matt Reilly, Managing Director, Yazeed Abu-Sa'a, Director, and Jeremy Lachtrupp, Director, Institutional Solutions

With the ever-present risk of market volatility, it is critical insurers understand the risks that exist across their business and within their investment portfolios. There are many ways to measure and manage risks in a portfolio, Conning has a range of methods to help insurers measure investment risk in isolation, view investment risk in the context of overall enterprise risk, and consider specific “objective” risks that get at the core of an insurer’s operations and goals.

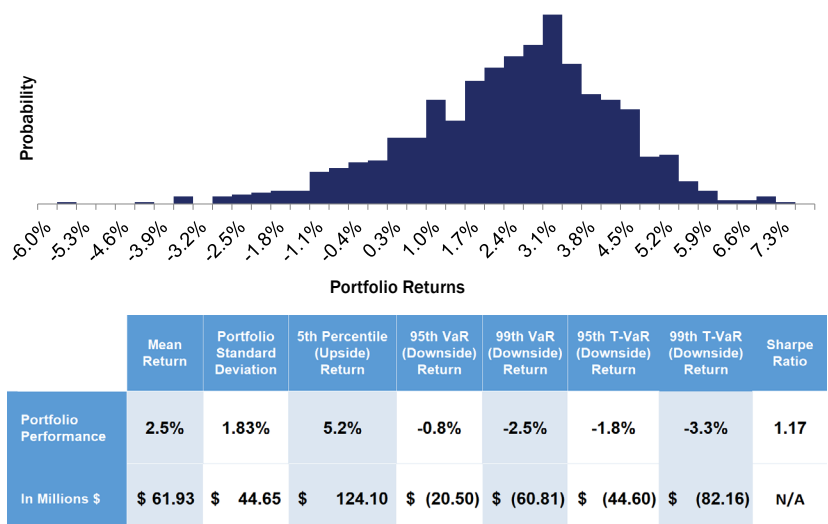
### Portfolio Risk

Analytics such as duration, convexity, and credit ratings provide a well-understood assessment of specific types of risks on a security or across a portfolio. However, they lack depth as they are point-in-time and focus on specific risks. They lack insight into risks that might not be priced in the current market and thus fall short in their ability to assess prospective future economic states and associated risk. For investors worried about risks looming in their portfolio, there are tools that can help measure those risks and provide insight on how to consider positioning the portfolio for a variety of other economic environments.

Conning utilizes its GEMS® economic scenario generator to create a set of 1,000 stochastic economic scenarios and accompanying investment returns to better understand the range of prospective portfolio outcomes. Figure 1 has a histogram and accompanying table of prospective returns for a portfolio over a one-year period. With this in hand, an insurer can understand estimates for average return over the time period across a range of scenarios along with the accompanying volatility. Other risk measures can be added, such as VaR or T-VaR, to better understand drawdown risk, or Sharpe ratio to better understand prospective returns on a risk-adjusted basis. This work can be extended across varying time frames to compare a variety of investment strategies.

Deterministic shocks are another tool to help investors understand how the portfolio could react across a range of scenarios. Figure 2 is a table of projected returns for a sample portfolio across a range of interest rate and credit spread shocks. With this type of tool insurers can understand what happens to their portfolios if spreads widen or tighten, if rates fall or increase, or any combination thereof to varying magnitudes.

**Figure 1 Stochastic Projected Portfolio Returns and Accompanying Metrics**



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**Figure 2 Deterministic Portfolio Interest Rate and Credit Spread Shocks**

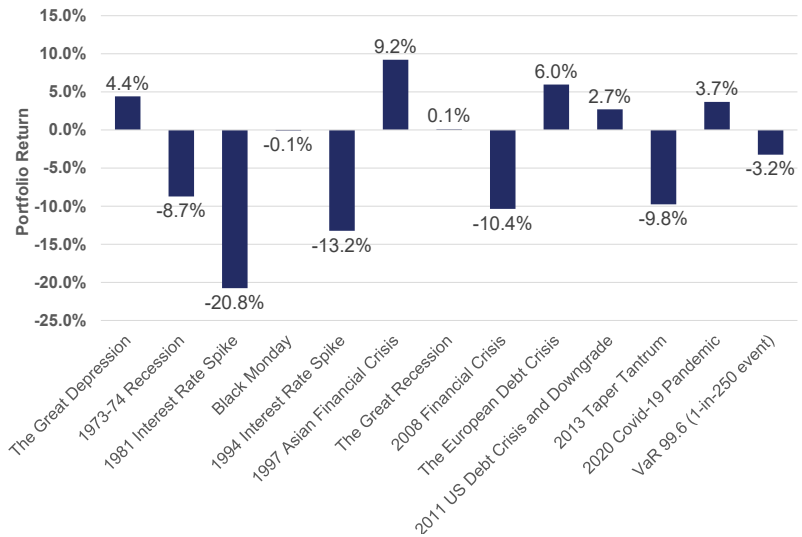
		Portfolio Return										
		Instantaneous Credit Spread Shocks (bps)										
		300	200	100	50	25	Level	-25	-50	-100	-200	-300
Instantaneous Yield Curve Shocks (bps)	300	-32%	-28%	-25%	-23%	-21%	-20%	-19%	-18%	-17%	-16%	-16%
	200	-25%	-22%	-17%	-15%	-14%	-12%	-11%	-10%	-8%	-7%	-7%
	100	-19%	-15%	-10%	-7%	-6%	-4%	-3%	-1%	1%	1%	1%
	50	-16%	-12%	-7%	-4%	-2%	-1%	1%	3%	5%	6%	6%
	25	-15%	-10%	-5%	-2%	0%	1%	3%	5%	7%	8%	8%
	Level	-14%	-9%	-3%	0%	2%	3%	5%	7%	9%	10%	10%
	-25	-12%	-7%	-1%	2%	3%	5%	7%	9%	11%	12%	12%
-50	-11%	-6%	0%	4%	6%	7%	9%	11%	14%	15%	15%	
-100	-8%	-2%	4%	8%	10%	12%	14%	16%	19%	20%	20%	
-200	-2%	4%	11%	15%	18%	20%	22%	25%	28%	29%	29%	
-300	-1%	5%	13%	17%	19%	21%	24%	26%	29%	31%	31%	

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Another deterministic view that resonates with investors is historic market stresses. By looking at how a portfolio might have performed across various market stresses, investors can relate their personal experiences and history with prospective portfolio returns. While we would not suggest an insurer set investment strategy to perform well in these historic market stresses, the related drawdown risk and the subsequent stress on business operations is often a useful lens.

With these tools insurers can better understand potential returns, drawdowns, and expected performance. But broader questions still loom: What does it mean for my business? How do I translate a 5% VaR to my overall balance sheet volatility or earnings potential? To better understand these risks, one must use enterprise-based metrics.

**Figure 3 Historic Market Stress Testing**



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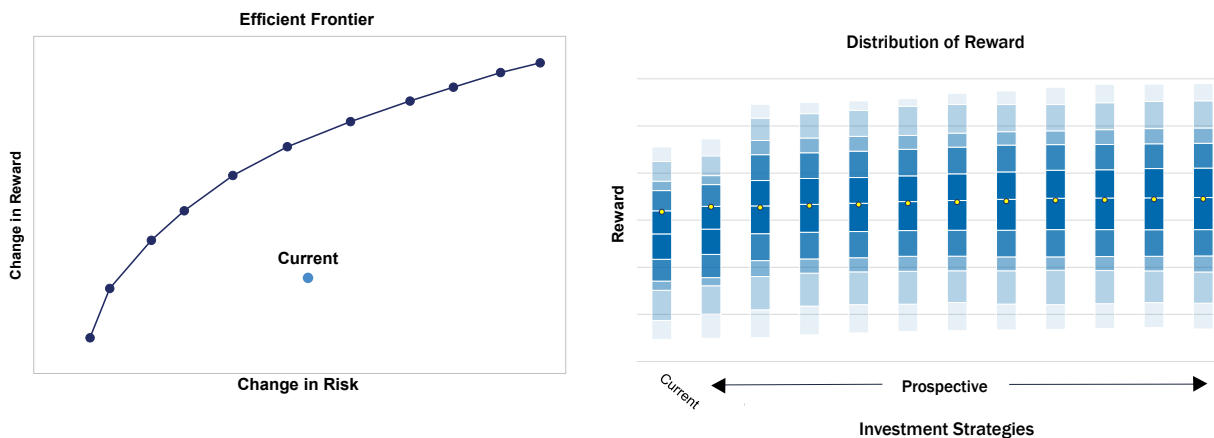
### Enterprise Metrics

Enterprise-based modeling is critical to better understand the role investments play within the organization. Conning works with insurers to understand their business including their competitive environment, business plans, and sources and magnitudes of non-investment risk, and can then create a comprehensive asset and liability model of their organization. The model lets us test different investment strategies across a range of risk spectrums, highlighting prospective changes to company value, profitability and associated risks.

An enterprise-based model allows us to understand and more accurately model the interplay between asset and liability performance. As an example, for property & casualty insurers, a higher inflationary scenario would likely lead to higher interest rates and a corresponding decline in asset values. At the same time, it would also likely lead to increased claim costs and possible increases in reserves for past and future losses. For a life and annuity insurer, higher interest rates could depress asset values and may lead to an increase in crediting rates or higher surrender rates on certain in-force policies. Conning believes tying together asset and liability performance leads to a better understanding of enterprise risk and return.

Conning uses a variety of tools to better understand prospective investment strategies. In Figure 4, the efficient frontier diagram on the left shows the impact of moving from left (lower investment risk) to right (higher investment risk) and the resulting shift in risk and reward characteristics. The metrics utilized in these exhibits (i.e., economic value or embedded value) vary but all focus on enterprise-level success by helping ensure the investment portfolio is well positioned to meet the insurer's claims and obligations.

**Figure 4 Efficient Frontier and Distribution of Reward by Prospective Strategies**

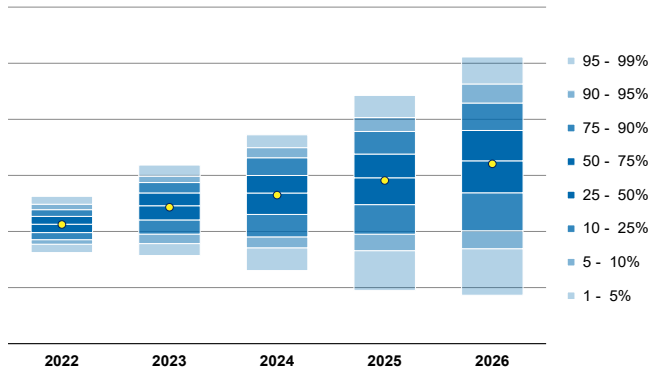


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Conning’s models are focused on investment optimization but they also incorporate all key aspects of the financial statements. Insurers can query and stress variables across a range of economic scenarios, such as learning more of a potential drawdown in surplus levels or the likelihood of experiencing negative cash flows for a particular period. Comprehensive enterprise-based modeling techniques can help insurers better understand these risks.

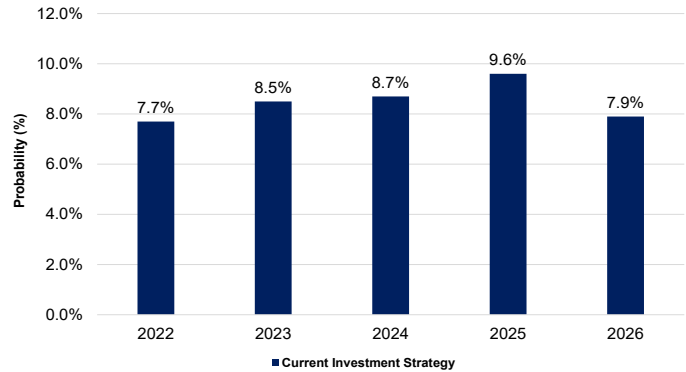
We also provide a view into the surplus available in an insurer’s operation. Figure 5 shows the different projected levels of surplus over the next five years across the 1,000 paths. Figure 6 analyzes the risk of surplus drawing down more than 5%. With this information an insurer can measure, analyze and budget for the risk of surplus drawdowns related to their current and/or prospective investment strategies.

**Figure 5 Distribution of Policyholder Surplus**



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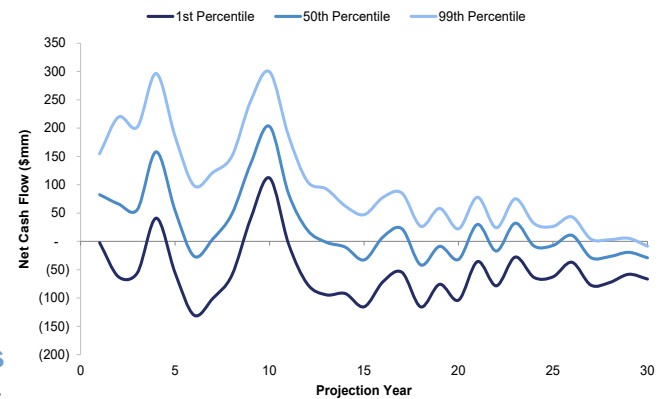
**Figure 6 Probability of Surplus Drawdown**



Prepared by Conning, Inc. Source: Conning Inc.’s GEMS® Economic Scenario Generator and ADVISE® Enterprise Risk Modeler. For illustrative purposes only.

For life, health and annuity writers, looking at a measure like net cash flow can be very important. Figure 7 illustrates the risk of shortfalls in net cash flows across the best and worst 1% of scenarios over 30 years. This analysis shows the prospective cash shortfall risk across a range of scenarios and accounts not only for investment performance but also for variability of any liabilities. For life insurers, this incorporates dynamic changes to crediting rates, modeled lapses or surrenders. For a P&C insurer, that liability variability might be more reliant on adverse loss scenarios or deficiencies in reserves arising from higher inflation environments.

**Figure 7 Distribution of Net Cash Flows**

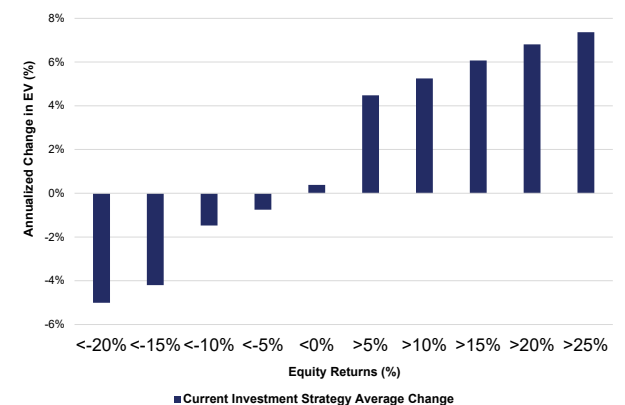


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**Focusing on Downfalls and Drivers of Enterprise Success**

Having a wide range of analytics is certainly powerful, but unless they are aligned with the objectives of the firm they may not be useful. A better understanding of adverse scenarios and measuring them relative to enterprise goals may prove a more productive exercise. Conning has enhanced our modeling capabilities to not just compare varied investment strategies but also to analyze specific economic risks.

**Figure 8 Economic Value by Equity Returns**

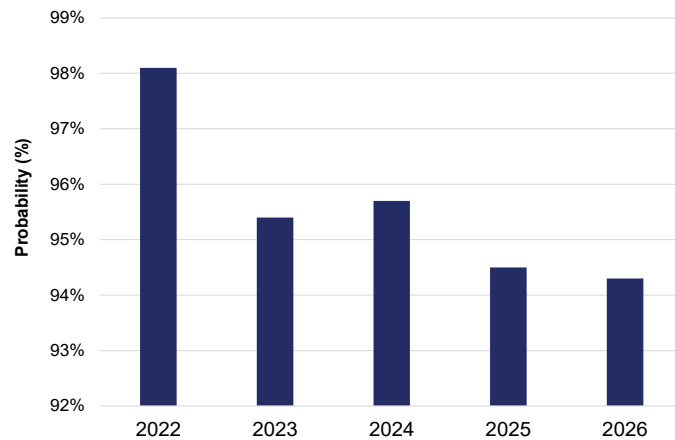


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There are a variety of economic and financial variables that impact the likelihood of insurers reaching their goals. Market volatility, interest rates and inflation are just a few. Figure 8 looks at what occurs to economic value, one of our enterprise valuation metrics, across a range of equity market scenarios. In lower equity markets (left side of the graph), economic value decreases; in higher equity markets (right side of the graph) economic value increases. This not only highlights the upside and downside of current equity allocations, but also displays an insurer’s leverage to equity markets. If levels of equity drawdowns are undesirable, insurers can hedge or reallocate their portfolio away from risk assets.

Many investment policy statements have language pertaining to income goals, capital preservation and total return. We can analyze an investment strategy to determine the likelihood of these outcomes. For example, Figure 9 offers a view of an investment strategy’s ability to maintain or increase a specified level of investment income. Similarly, we can view the likelihood of reaching certain levels of excess surplus or risks of certain surplus drawdowns. Either by viewing the analysis through the lens of the current investment strategy or a prospective one, an insurer can better understand and plan for projected income levels or a variety of other metrics. This not only assists in decision making by aligning investment strategy with enterprise objectives, but also provides talking points for rating agency and regulator meetings and helps focus the board and committees on appropriate metrics.

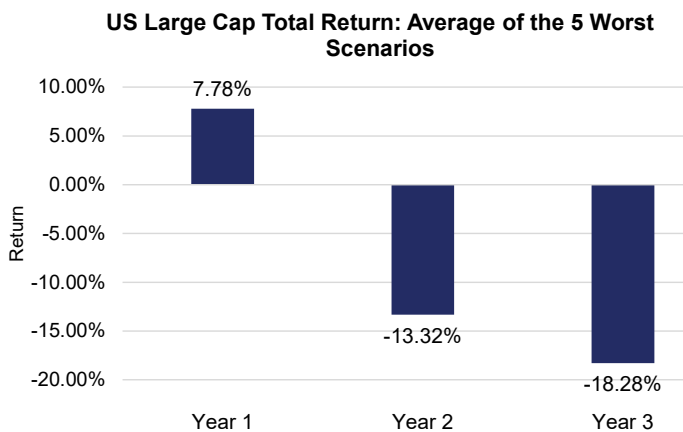
**Figure 9 Probability of Maintaining Investment Income**



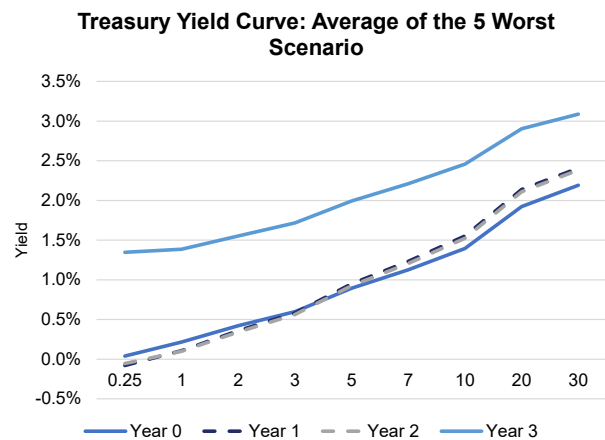
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We can also focus on the most adverse scenarios and identify their drivers. Figure 10 offers a deep dive into the connection between capital market performance and enterprise outcomes for an annuity writer, with a focus on the worst potential outcomes. In this case, the worst outcomes are a result of poor equity markets and lower rates.

**Figure 10 Attributes of Worst Outcomes**



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In summary, understanding risk is critical but seeing it in context can help shed additional light. Conning’s approach to risk management aims to help insurers manage risk in a way that helps them develop a more comprehensive view of their business and to assist them in pursuit of their goals.

**About GEMS®**

An economic scenario generator (ESG) enables financial services companies to model future states of the global economy and capital markets for the purposes of portfolio and risk management. The analysis of a stochastic distribution of possible economic futures—a distribution which includes unexpected but plausible outcomes—is critical for testing a business model under a wide variety of economic conditions.

Conning’s GEMS® Economic Scenario Generator is an award-winning\*, state-of-the-art stochastic economic scenario generator with leading-edge economic and financial models, including alternative assets and a wide range of derivatives. GEMS® provides a comprehensive analysis of the risks that firms face, the relationship between those risks, and the potential rewards in retaining them.

\*Market Scenario Generator of the Year, Risk.net Markets Technology Awards 2021. Awards, rankings, and other forms of recognition are not a guarantee of Conning’s future performance. Awards may not be representative of any one client’s experience. For more information and disclosures about our industry recognition, please visit our website [here](#).

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*This viewpoint also features significant contributions from Conning analyst Jake Meaney.*

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