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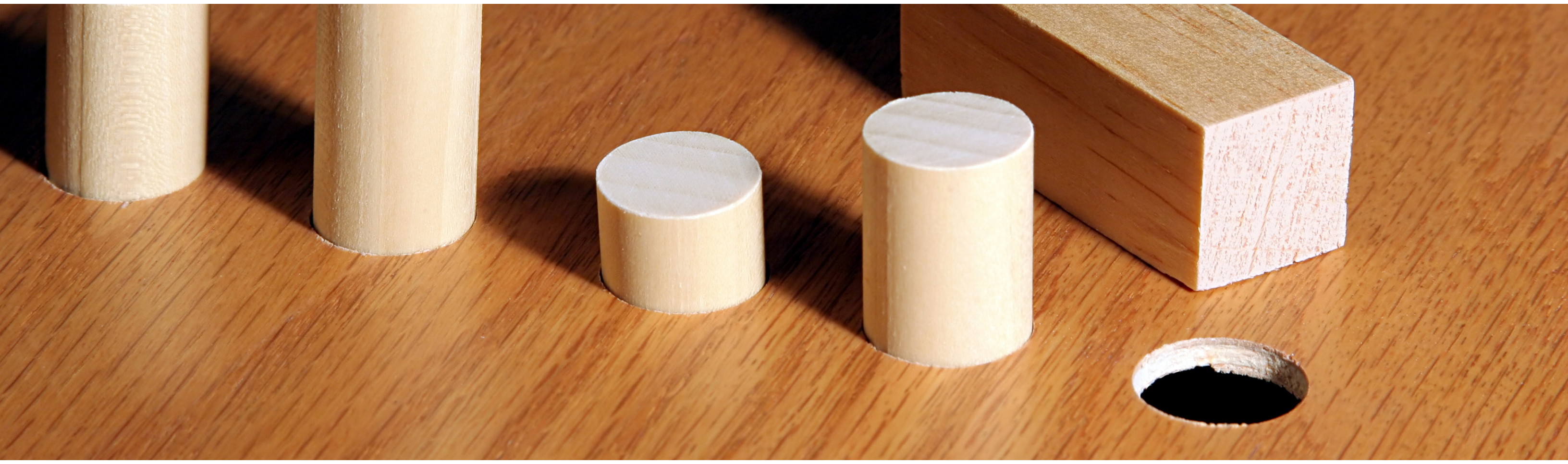


ZILING JIANG
Head of Insurance Analytics, EMEA

STEPHEN SMITH
Global Head of Insurance Analytics

MATTHEW MALLOY
Global Head of Insurance Solutions

The Solvency Sharpe Ratio: Strategic Asset Allocation for Insurers

To maintain book yield, many insurers are shrinking the risk-free asset allocations in their investment portfolios in favor of growing allocations to alternatives. Against this background, a well-designed strategic asset allocation ("SAA") framework could help companies navigate risk and improve investment efficiency. We show that the risk measure used to optimize an SAA has a substantial impact on the output, and believe that an SAA assessed with a range of risk measures is likely to exhibit superior characteristics and improved resilience against a wider range of outcomes, relative to one assessed from a narrower perspective. With that in mind, we introduce the "Solvency Sharpe Ratio" as a new risk measure for insurers' SAA optimizations. We argue that this measure is intuitive for all insurance company stakeholders, and show that it tends to justify a less risk-averse and more long-term-oriented SAA than other, commonly used risk measures. The Solvency Sharpe Ratio is a useful addition to the set of risk measures an insurer can use when they are considering SAAs from multiple perspectives.

Executive Summary

- Declining government bond yields are a challenge on both the asset and the liability side of insurance companies' balance sheet, and investors have responded by allocating more to credit and alternative assets.
- The growing complexity of investment portfolios is putting greater demands on Strategic Asset Allocation (SAA).
- We set out the pros and cons of existing SAA optimization techniques.
- We show the importance of conducting SAA optimizations using multiple risk measures by demonstrating how much of an impact changing the risk measure has on the output SAA.
- In addition to the commonly used surplus volatility, solvency capital requirement (SCR) and tail risk measures, we introduce a new risk measure for insurers: the "Solvency Sharpe Ratio," calculated by dividing surplus return by solvency ratio volatility.
- We argue that this measure is intuitive for all insurance company stakeholders, and show that it tends to justify a less risk-averse and more long-term-oriented SAA than other risk measures.
- Using a hypothetical case study and stochastic asset return scenarios, we show that a Solvency Sharpe Ratio optimization would result in an SAA that reduces short-term volatility and aims for better long-term performance.
- We argue that the Solvency Sharpe Ratio encourages insurance asset allocators to focus more on diversified growth than on short-term capital consumption not caused by the insurer's own business activities, and is therefore a useful addition to the set of risk measures an insurer can use when they are considering SAAs from a range of risk perspectives.

Background

The insurance industry is facing a challenging investment environment. Thirty years ago, government bonds provided enough returns to back long-term guarantees. From the late 1990s, however, risk-free rates declined steadily, forcing insurers to go down the credit spectrum. Since the 2008 crisis, a simple euro investment grade allocation would have led to falling and unsustainable book yield and a "negative spread" between book yield and liabilities. Falling yields did create accumulated unrealized gains in insurers' books, and transitional measures under regulations such as Solvency II helped boost some insurers' solvency ratios—but these positive factors are likely to fade away with time.

During the same time, growth assets could have added meaningful returns. However, insurers are subject to tightening regulations that penalize equity exposure. European insurers in particular are therefore pursuing diversified beta and alpha sources, gradually adding more real economy-related, private, illiquid, opportunistic assets and quantitative strategies to their investment portfolios. Some regulators have adapted to this trend and provided favorable guidance and capital relief. For example, EIOPA, the European insurance regulator, recently approved important revisions to Solvency II that give capital relief to long-term equity, private equity and unrated debt. Other jurisdictions may follow suit.

Against the backdrop of shrinking high-quality allocations and growing allocations to alternatives, a well-designed strategic asset allocation ("SAA") framework could help companies navigate risk and improve investment efficiency.

In this paper, we discuss:

- The SAA optimization techniques currently used by insurers
- The importance of testing multiple flexible-risk measures
- Our new concept of the "Solvency Sharpe Ratio" and its merits, with a case study
- Portfolio optimization techniques that can further improve outcomes

SAA Optimization Techniques: Pros, Cons and Challenges

Large European insurers typically follow a systematic, top-down approach when performing their SAA analysis, although discretionary practices also exist. Their SAA frameworks are often built from their capital models with adjustments to take account of pricing basis, granularity, time horizon and any metrics of interest.

There is a rich set of possible optimization objectives: risk-adjusted return over liabilities, return-on-capital, embedded value, policyholder or shareholder surplus, among others. The typical risk measures used are: investment return volatility, net asset volatility, shareholder burn-through risk and portfolio shortfall risk. Constraints to the SAA can vary greatly among companies and are determined by their capital headroom, risk appetite, business profile, regulatory regime and group structure.

Below, we show the three main SAA optimization techniques deployed. Small to midsized companies tend to use the simpler kinds, while the stochastic optimization techniques, for which tailoring is needed even when a vendor model is bought, are more often used at large institutions.

Mean Variance Optimization (MVO)

Asset interactions are summarized in a matrix

Pros:

- Modern portfolio theory is widely understood and used
- Easy to set up and run
- The algorithm is robust and can handle very granular problems

Cons:

- Variance is minimized, but higher order risks cannot be directly captured, potentially leading to tail risk being insufficiently reflected
- Portfolio rebalancing and non-market-replicable liability can be challenging to model
- Sensitive to assumptions

Historical Return Series

Run historical returns through a balance sheet model, then solve for an SAA that optimizes for a particular objective

Pros:

- Assumption- and model-free
- Suitable for tailored optimization objectives
- Can model multi-entity, multi-jurisdiction group structures

Cons:

- Historical bias (e.g. past 10 years' declining yields) and idiosyncrasies are difficult to remove
- One scenario only; might be insufficient for a balanced vision

Stochastic Scenarios

Similar to the historical return series method, but based on thousands of forward-looking economic scenarios

Pros:

- Can reuse Economic Scenario Generators and Asset-Liability Management models used in reserving and product pricing
- Tail risk can be reflected using scenarios generated through a copula and moment-matching marginals
- Outputs are cross-scenario and can assess shortfall risk by scenarios

Cons:

- Challenging to develop and calibrate
- Sensitive to assumptions

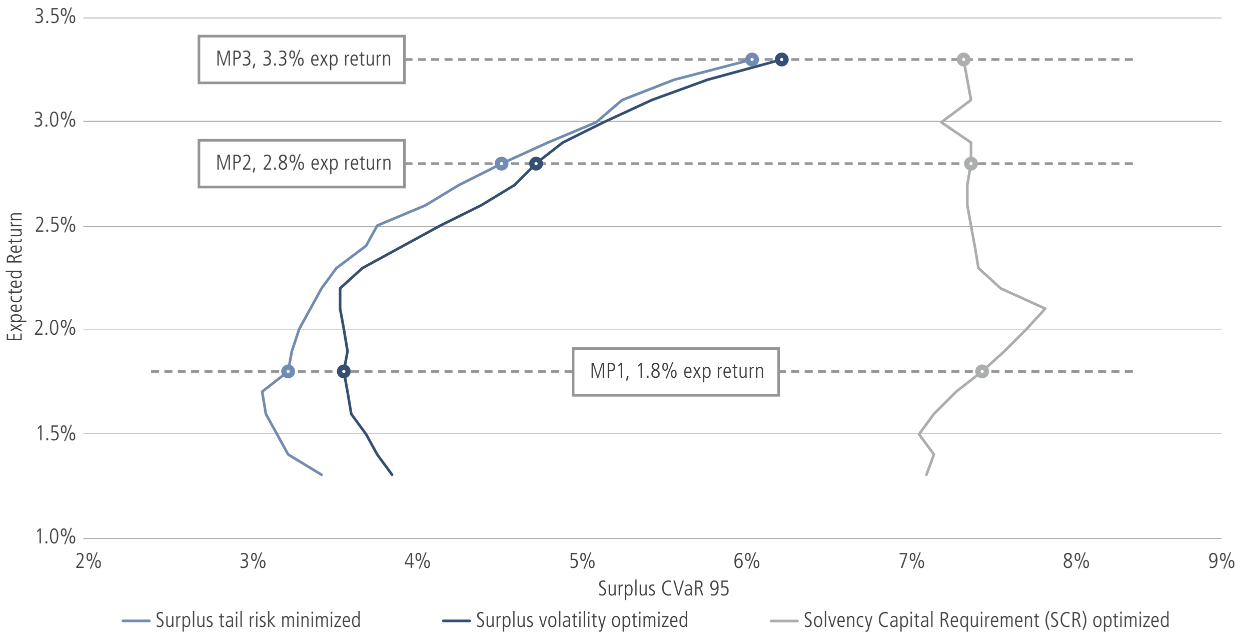
Importance of Testing Multiple Flexible-Risk Measures

We believe that an SAA assessed with a range of risk measures is likely to exhibit superior characteristics and improved resilience against a wider range of outcomes, relative to one assessed from a narrower perspective. This inevitably comes at the expense of model optimality, but optimality in an SAA framework is, in any case, subject to limitations in assumptions, accuracy, granularity, plausibility and whether you are backward-looking or forward-looking. Relying on a wider range of views will help mitigate model errors.

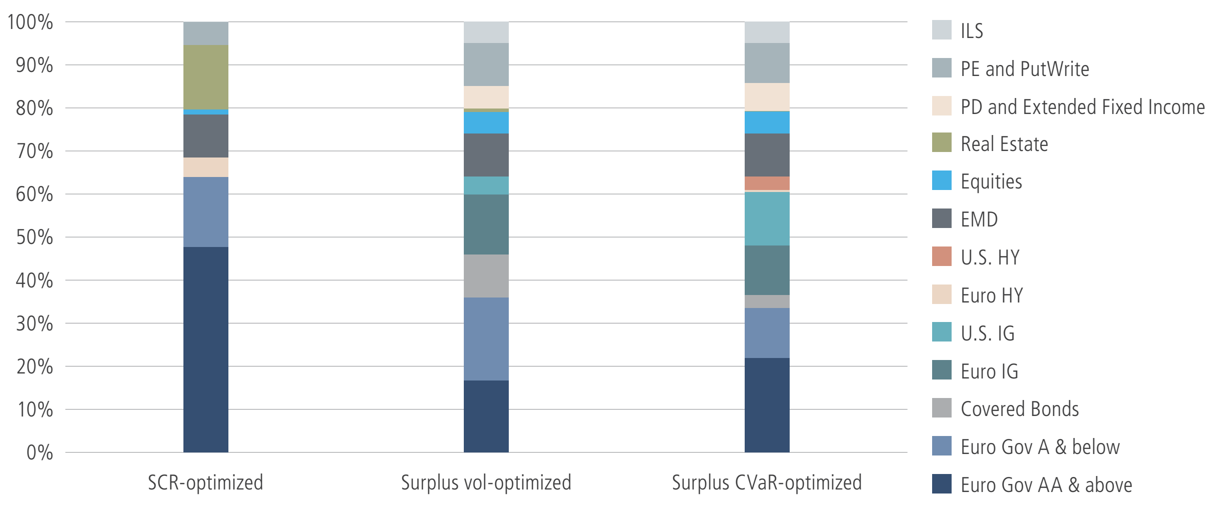
Figure 1 shows a tail-risk efficient frontier alongside two other efficient frontiers expressed along the tail risk axis (Surplus Conditional Value at Risk in the worst 5% of cases). We can see that points at the same level of expected return but using different efficient frontiers are likely to suggest very different model portfolios (MPs). The metric you choose to define risk makes a big difference to the optimal portfolio output.

FIGURE 1. THE CHOICE OF RISK MEASURE HAS A BIG EFFECT ON STRATEGIC ASSET ALLOCATION (SAA) OUTPUTS

Three different optimizations, plotted against the tail-risk measure, showing return and risk for three model portfolios



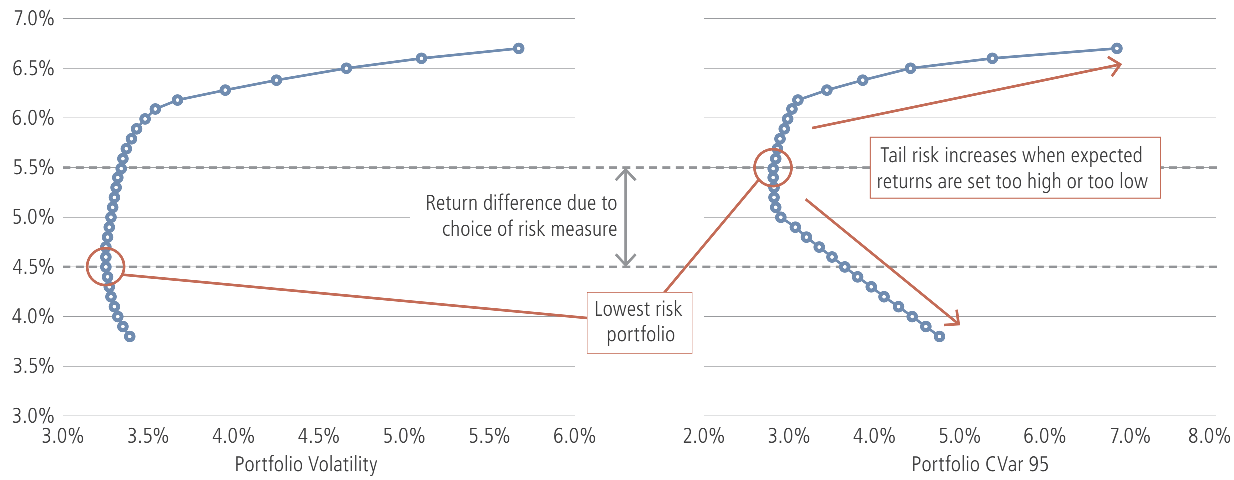
Different SAA outputs for model portfolio 2 (MP2) (expected return 2.8%)



Source: Bloomberg, Neuberger Berman. Asset classes used: Euro Government bonds, Euro Covered Bonds, Euro IG Corporates, U.S. IG Corporates, Euro HY, U.S. HY, EM Sovereigns, EM Corporates, MSCI Europe, MSCI ACWI, European Real Estate, Long-dated U.S. Taxable Municipals, Private Debt, Private Equity, Insurance-linked Securities, PutWrite. Index ticker information is available in Appendix II. Expected returns and correlations are based on exponentially weighed historical moving averages.

Figure 2 shows efficient frontiers derived from a consistent universe of asset classes, including alternatives such as CLO BB bonds and residential mortgage loans, using two different risk measures. Using portfolio volatility in a mean-variance optimization, the lowest risk point occurs at ~4.5% expected return, while under portfolio tail risk optimization the lowest risk point is at ~5.5% expected return. CVaR-95 analysis also shows that tail risk increases significantly when expected returns are set too low.

FIGURE 2. THE CHOICE OF RISK MEASURE HAS A BIG EFFECT ON RISK APPETITE AND THE OPTIMAL PORTFOLIO'S EXPECTED RETURN



Source: Bloomberg, Neuberger Berman. Asset classes used: Cash, U.S. and EU bank loans, High Yield, EM Sovereign, EM Corporates, CLO BB-B, Private Debt, Distressed Debt, Specialty Finance. Index ticker information is available in Appendix II. Expected returns and correlations are based on exponentially weighed historical moving averages.

Practitioners are urged to test multiple risk measures and consider the resulting differences before making an informed final decision on asset allocation and risk appetite.

The Solvency Sharpe Ratio and Its Merits

We have developed a new concept that is an adaptation of the classical Sharpe Ratio to an insurance balance sheet context. The "Solvency Sharpe Ratio" is defined as:

"Solvency Sharpe Ratio" = Surplus return / solvency ratio volatility (adjusted for shortfall risk)

This is similar to the classical Sharpe Ratio with the following changes:

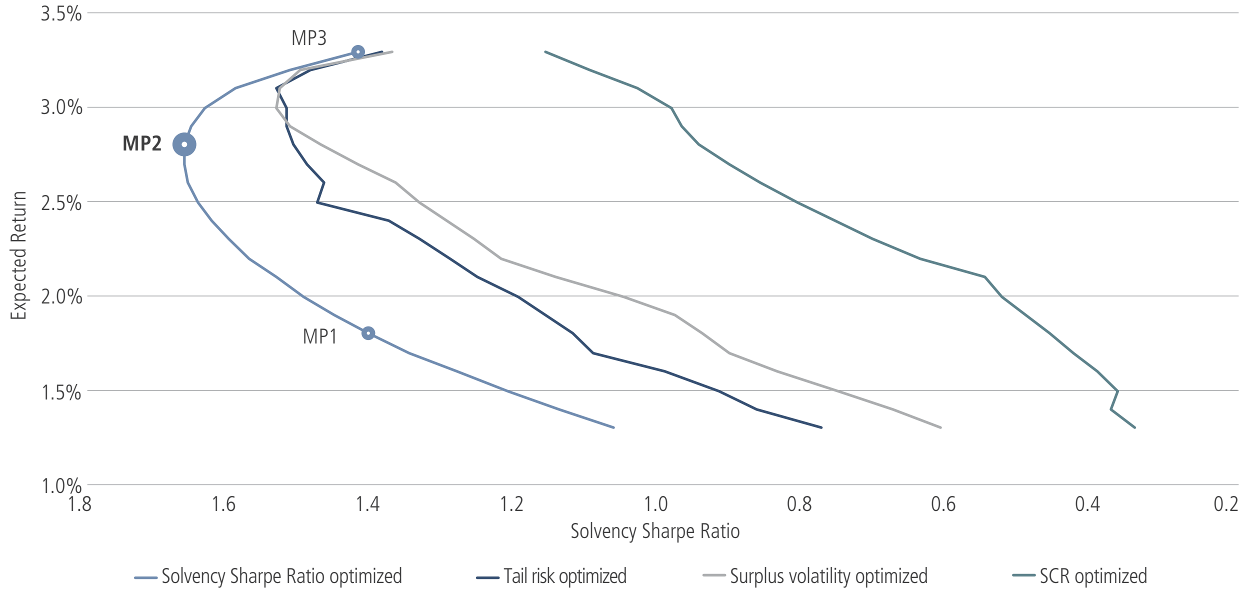
- The risk-free rate is replaced with a liability growth rate because both are meant to be hurdle rates against which portfolio performance is measured
- Asset volatility is replaced with solvency ratio volatility to reflect an insurer's focus as a liability- and solvency-driven investor (this demands more frequent marking-to-market of the solvency level than regulatory reporting, thus placing higher demands on ALM and capital management capabilities)
- We also apply an adjustment factor to account for shortfall risk because surplus return and solvency ratio volatility cannot be calculated for scenarios in which the investor's surplus is exhausted; this factor is the scaled inverse of the shortfall scenario probability, and is applied to the Solvency Sharpe Ratio value, i.e. 1/(shortfall risk %)/10.

The numerator is what CIOs and shareholders care most about, while the denominator is what actuaries and regulators care most about. To get this right, both teams need to communicate effectively with one other—but the reward is a performance benchmark that both will find relevant.

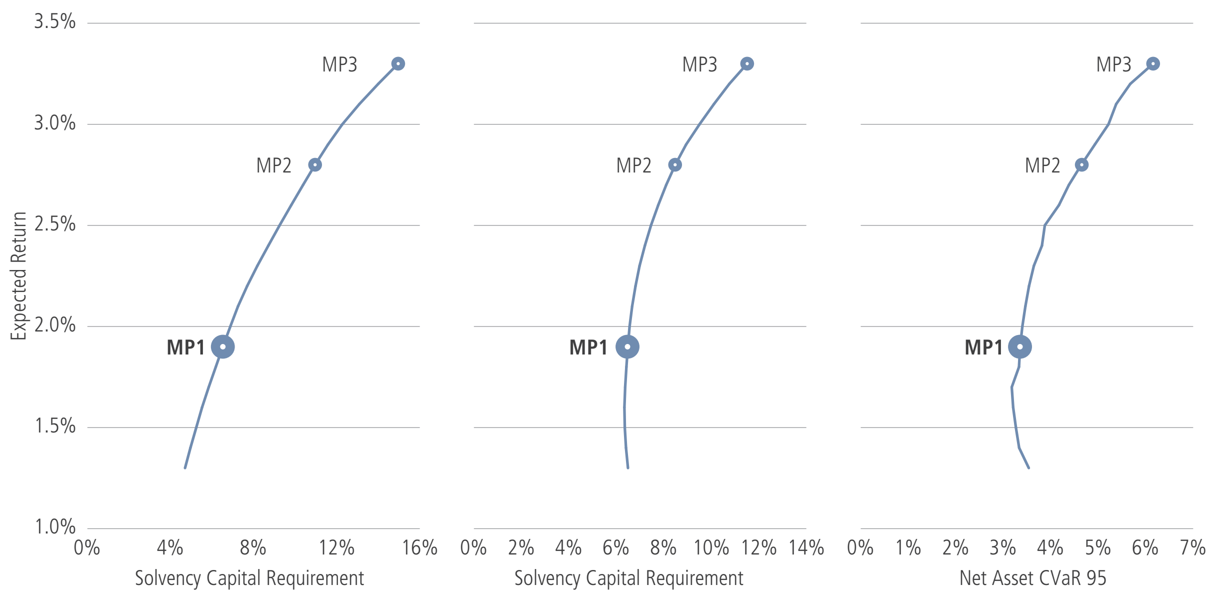
Figure 3 shows the efficient frontiers for the three risk measures we have already examined (surplus volatility, solvency capital requirement and tail risk) alongside a fourth efficient frontier for the Solvency Sharpe Ratio.

FIGURE 3. THE SOLVENCY SHARPE RATIO RISK MEASURE GENERATES AN OPTIMAL PORTFOLIO WITH A RELATIVELY HIGH EXPECTED RETURN

Using the Solvency Sharpe Ratio, MP2 is the optimal model portfolio, with an expected return of 2.8%



Using other risk measures, the optimal portfolio is closer to MP1, with an expected return of just 1.8%



Source: Bloomberg, Neuberger Berman. Asset classes used: Euro Government Bonds, Euro Covered Bonds, Euro IG Corporates, U.S. IG Corporates, Euro HY, U.S. HY, EM Sovereigns. Index ticker information is available in Appendix II.

The first chart shows all four efficient frontiers expressed along the Solvency Sharpe Ratio x axis. The other charts show each of the three traditional efficient frontiers expressed along their corresponding x axes. This leads us to an interesting finding: When solvency capital requirement, surplus volatility or surplus tail risk are used as the risk measure, we find that MP1, with an expected return of 1.8%, tends to be closest to the most efficient portfolio. As the first chart shows, however, with the Solvency Sharpe Ratio the most efficient of the three portfolios is MP2, with an expected return of 2.8%. This level of expected return generates a portfolio well beyond the minimum risk point for the other risk measures. We observe the same phenomenon across different SAA cases and liability profiles.

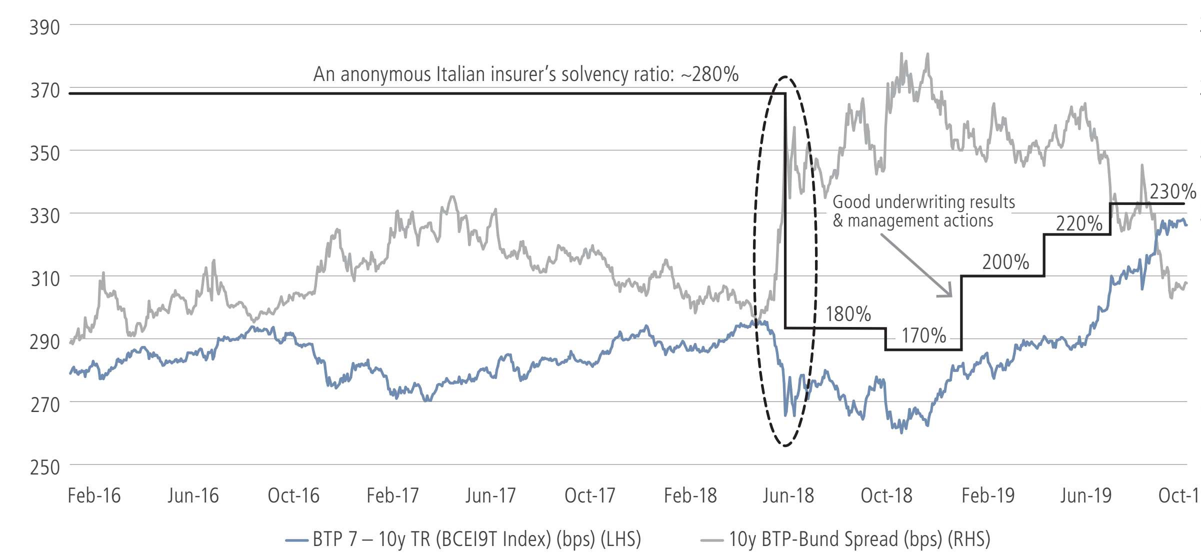
In other words, the Solvency Sharpe Ratio justifies a more ambitious SAA than other risk metrics. It encourages us to think more long-term and focus more on diversified growth than on short-term capital consumption not caused by the insurer's own business activities.

Our argument here is not that the Solvency Sharpe Ratio is superior to other risk measures, but that it provides another useful addition to the set of risk measures an insurer can use when they are considering SAAs from multiple perspectives.

Case study: Navigating Through Sovereign Debt Volatility

Domestic sovereign debt is usually a major component in an insurance investment portfolio. Under Solvency II, European sovereign debt receives favorable treatment. Nonetheless, Solvency II and the new IFRS 9 and IFRS 17 are all market-consistent frameworks that will continue to expose insurers to the mark-to-market volatility of sovereign debt. In Italy, for example, some companies' reported solvency ratios dropped by over 100 percentage points in a matter of months in 2018 due to widening spreads in Italian government debt (figure 4).

FIGURE 4. SOVEREIGN DEBT VOLATILITY CAN HAVE A BIG IMPACT ON SOLVENCY RATIOS



Source: Bloomberg; Investor presentations.

The insurance company shown in figure 4 posted good underwriting results and applied various capital management actions and accounting/tax optimizations during 2018, and as a result its solvency ratio gradually returned to a normal level. From a pure investment perspective, it is useful to imagine what the company's SAA would have looked like just before the sovereign spread crisis, and what the implications of different allocations would have been.

Imagine we are at year-end 2017. The company's investment committee is carrying out its SAA. The six allocation plans shown in figure 5 are considered, with Italian government bonds (BTP) being the largest allocation in each of them. The SAAs vary from low-risk appetite (A) to high-risk appetite (F).

We then model 1,000 stochastic scenarios of asset returns for a horizon of 10 years, from December 31, 2017 through December 31, 2027, calibrated without using any information available to us after 2017. The simulated series are moment-matched against history (that is, volatility, skewness, kurtosis and correlations are matched between simulation and history), while their returns are adjusted according to Neuberger Berman's long-term forward-looking assumptions as of that time (shown in Appendix II). The projected confidence intervals for each asset class and for the three SAA plans are plotted in the charts in figure 5, along with the subsequent real histories, plotted as red lines.

Finally, these asset-class-level scenarios are used to evaluate and compare the risk-return characteristics of the allocation plans, as well as the insurance company's balance sheet statistics, at the end of the projection horizon.

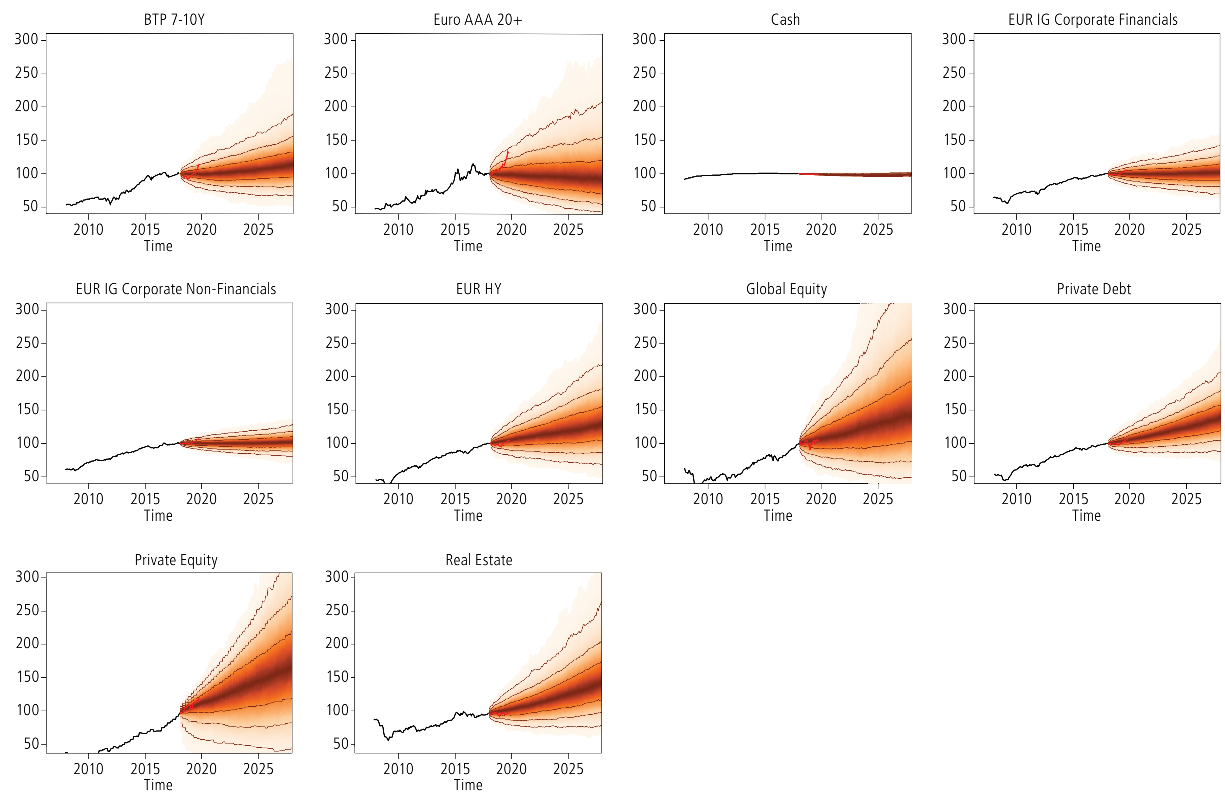
FIGURE 5. THE PERFORMANCE OF SIX HYPOTHETICAL STRATEGIC ASSET ALLOCATIONS AT AN ITALIAN INSURANCE COMPANY, 2017 – 2027

Asset allocation plans at end-2017

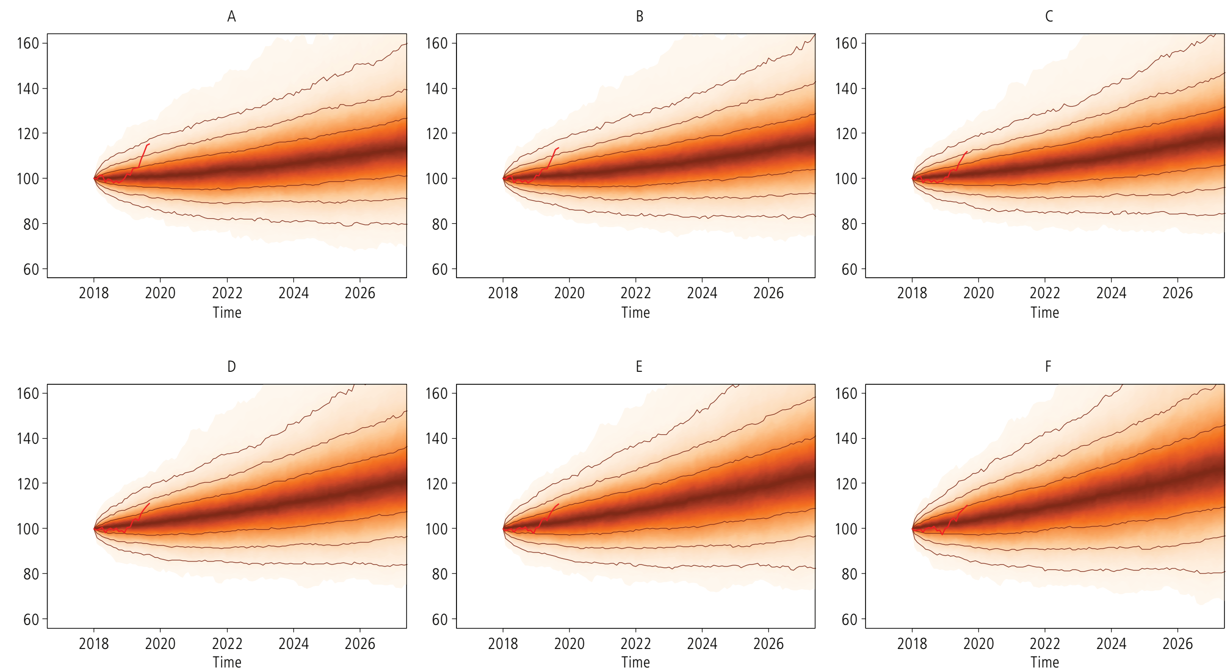
INCREASING RISK

Asset Classes	Plan A	Plan B	Plan C	Plan D	Plan E	Plan F
BTP 7-10Y	45%	40%	35%	26%	22%	18%
Euro AAA 20+	15%	10%	5%	5%	5%	5%
Cash	2%	1%	0%	0%	0%	0%
EUR IG Corporate Financials	10%	12%	14%	14%	12%	10%
EUR IG Corporate Non-Financials	10%	12%	14%	14%	12%	10%
EUR HY	2%	3%	4%	5%	6%	7%
Global Equity	5%	7%	9%	15%	20%	25%
Private Debt	2%	3%	4%	5%	6%	8%
Private Equity	3%	4%	5%	6%	7%	7%
Real Estate	6%	8%	10%	10%	10%	10%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Simulated asset classes total return confidence intervals, calibrated as of end-2017, with subsequent real histories plotted in red



Simulated SAA plan return confidence intervals, calibrated as of end-2017, with subsequent real histories plotted in red



Return and risk statistics for each SAA plan, 2017 – 2027

Statistics at End of Year 10	Plan A	Plan B	Plan C	Plan D	Plan E	Plan F
Asset return	1.44%	1.60%	1.85%	2.09%	2.35%	2.56%
Asset volatility	5.67%	5.43%	5.43%	5.74%	6.19%	6.76%
Market Risk SCR as % of Assets, at t=0	3.40%	4.80%	6.20%	8.00%	9.50%	10.90%
CVaR 5% asset return	-2.34%	-1.96%	-1.81%	-1.84%	-1.98%	-2.21%
% of Shortfall (negative surplus) scenarios	4.80%	3.60%	3.80%	4.30%	5.30%	6.80%
Solvency Sharpe Ratio	**0.34**	**0.63**	**0.83**	**0.95**	**0.93**	**0.83**
Surplus ann. return	3.80%	4.80%	6.20%	7.50%	8.90%	10.60%
Solvency ratio volatility	25.50%	21.80%	19.40%	18.20%	18.40%	19.20%
Shortfall risk adjustment factor	2.08	2.78	2.63	2.33	1.89	1.47

Source: Neuberger Berman. For illustrative purposes only.
The charts show 1,000 stochastic scenarios of asset returns, moment-matched against history (that is, volatility, skewness, kurtosis and correlations are matched between simulation and history), and calibrated according to long-term forward-looking capital market assumptions as of end-2017; the lines show the 50th, 80th and 95th confidence intervals and the outermost boundary of the colored region is the 99.5% confidence interval; the subsequent real histories of each asset class are plotted as red lines. Asset allocations are rebalanced annually and shareholder dividends are ignored.
The summary statistics, with the exception of the CVaR measures, are all calculated as the median of the scenarios. In calculating surplus return and solvency ratio volatility, shortfall scenarios were excluded because they would have led to management actions outside the scope of our modelling. The shortfall risk adjustment factor is the inverse of the shortfall percentage scaled up by 10, i.e. 1/(shortfall risk %)/10.
Balance sheet modelling method and assumptions include: best estimate liabilities (BEL) start at 75% of asset portfolio value and each year its size is increased by an annual bonus that equals 30% of the investment return of the year if above 0%, and if the company's solvency ratio is above 150%; risk margin is assumed to be 5% of BEL throughout; insurance premiums and payouts assumed to cancel out each other; base SCRs are calculated at asset class level and aggregated; and loss-absorbing capacity of technical provisions and deferred taxes are assumed to be 50% of the base SCR.

The Solvency Sharpe Ratio consistently prefers Plan D (and not just for the 10-year horizon but for all time horizons). When we look more closely at three other measures—percentage of shortfall scenarios, CVaR 5% asset returns and surplus returns—we find that they look worse for the higher-risk plans initially, but improve over time. At the end of Year 10, Plan C exhibits the lowest tail risk (-1.81%), while Plan D exhibits slightly higher tail risk (-1.84%) but notably higher surplus growth (7.5% versus 6.2%). The Solvency Sharpe Ratio is a balanced measure of these multiple considerations and therefore peaks with Plan D at 0.95. Plans A and B appear too conservative, whereas Plans E and F do not provide sufficient surplus growth to justify the increased downside risk to which they are exposed.

Plan D is closest to the "turning point" in a classical efficient frontier analysis, and this would have been the asset allocation suggested by the Solvency Sharpe Ratio at the end of 2017. The conclusion would certainly be different if we look at the plans through an SCR lens (which would have suggested Plan A) or the tail-risk lens (which would have suggested Plan C).

As we can see in the six plan-level charts in figure 5, so far, in real history since 2017, Plan A has outperformed the other five due to the strong recovery of BTPs and the rally in long-dated European AAA bonds, and an increase in the volatility of risky asset classes since mid-2018. Nevertheless, we still have more than eight years to discover whether the Solvency Sharpe Ratio indicator would have pointed this Italian insurer in the right direction at the end of 2017.

Portfolio Optimization Techniques That Further Improve Outcomes

Insurance investment portfolios typically allocate more than 60% to government and corporate bonds ("Core Fixed Income", or CFI), held on a buy-and-maintain basis. An SAA should be augmented with line-level fine-tuning of these CFI portfolios. To enable insurance experts and their portfolio management partners to work synergistically, and to ensure that CFI portfolios can be maintained efficiently and with minimal operational costs, we think it is best to take a systematic approach to dealing with common objectives, such as book yield and return-on-SCR; duration and quality; liquidity and cash flows; turnover and P&L realization; and concentration limits and restricted exposures.

Line-level portfolio optimization closely resembles asset-class-level SAA planning in that it involves multidimensional and sometimes contradicting objectives. There are practical considerations associated with market accessibility and the large size of the investable universe versus limited research capacity. How should practitioners balance fundamental opinion with quantitative optimization, or manual and discretionary with automatic and systematic portfolio construction? What is the appropriate time horizon for consideration? We shall discuss how to deal with these insurance-specific CFI optimization challenges in a separate paper.

Appendix I: Neuberger Berman's Strategic Asset Allocation Process for Insurance Clients

Neuberger Berman has a dedicated Insurance Analytics Team with expertise in all global regions and jurisdictions, specializing in asset allocation, asset-liability modelling, portfolio construction, capital optimization and statistical analysis. We can provide a range of analytical services to clients and potential clients, including the SAA analysis presented in this paper.

SAA is a portfolio optimization process that incorporates multiple objectives and constraints to enhance a portfolio's risk-return profile; results from the SAA can be used to support benchmark construction and/or quantify the impact of constraints within the investment policy.

Data Request

To tailor an SAA solution for a client, NB requests:

- Asset data (investment & overlay details)
- Liability data (projected liability cash flows)
- Balance sheet data (capital details)
- Objectives/constraints (client-specific)

The more detail the client provides, the more NB can customize the analysis.

Asset Class Mapping

NB classifies each investment in the client portfolio into an asset class and compares the client's portfolio analytics with representative index analytics.

The goal is to validate the representative indices, which will be used to proxy current and investable asset classes.

Strategic Asset Allocation

NB constructs an optimization framework that seeks to maximize risk-adjusted returns while incorporating the client's constraints.

The strategic asset allocation can be run as a single-entity SAA or as a multi-entity SAA; the multi-entity SAA solves for an optimal combination of single-entity portfolios, each with their own unique constraints.

The results provide clients with an investable strategic allocation on which tactical adjustments can be applied, and can be iterative depending on feedback.

Customizable Methodology:

- NB can structure the process to minimize asset risk or asset-liability (surplus) risk.
- NB can provide return and risk attribution.
- NB can customize constraints to include regulatory capital, income volatility, rating, cash flow constraints, etc.

Historical Analyses

NB provides historical analyses such as scenario testing or shock analysis to measure the tail risk of portfolios, including those from the SAA.

Forward-looking Analyses

NB runs Monte Carlo simulations to evaluate portfolio strategies and measure potential risks; the stochastic engine incorporates asset-liability correlations, non-normal distributions and fat-left tails.

Customized Analyses

NB has run a variety of SAA-related analyses to target client-specific goals; analyses include but are not limited to benchmark construction, capital analysis, cash flow testing and OTTI analysis.

Ongoing Maintenance

- Neuberger Berman will continue to monitor the recommended strategic asset allocation after the initial analysis is complete.
- A refresh of the SAA is recommended every two to three years or after a significant change in capital markets, liabilities or other client-specific events.

Appendix II: Asset Class Assumptions

Expected returns and volatility

Asset Class	Index Source	Index Name	Frequency of Calibration	Currency of Calibration	1 year expected return	5 year expected return	10 year expected return	Ann. Vol (%)
BTP 7-10Y	BCEI9T Index	Bloomberg Barclays Italy Govt 7 to 10 Year TR	Monthly	EUR	0.00%	2.00%	2.50%	7.86%
Euro AAA 20+	H18120EU Index	Bloomberg Barclays Euro Treasury 20+ Yr AAA Total Return Index Hedged EUR	Monthly	EUR	0.00%	0.00%	0.00%	13.10%
Cash	BXIIE3MC Index	Barclays 3 month Euribor Cash Index	Monthly	EUR	-0.50%	-0.15%	0.45%	0.42%
EUR IG Corporate Financials	QW5M Index	IBOXX Euro Financials Overall Total Return Index	Monthly	EUR	-1.50%	-0.10%	1.00%	5.41%
EUR IG Corporate Non-Financials	QW51 Index	IBOXX Euro Non-Financials Overall Total Return Index	Monthly	EUR	-1.90%	-0.40%	0.80%	3.68%
EUR HY	75% BCBATREH + 25% LP01TREH	75% US HY (BCBATREH) + 25% EU HY (LP01TREH)	Monthly	EUR	3.20%	2.50%	3.00%	9.23%
Global Equity	M0WOHEUR Index	MSCI World 100% Hedged to EUR Net Total Return EUR Index	Monthly	EUR	4.00%	4.60%	5.10%	14.59%
Private Debt	2/3 EUR Corp + 1/3 EUR HY	2/3 LP01TREH Index + 1/3 I02566EU Index	Monthly	EUR	3.00%	3.50%	3.70%	6.45%
Private Equity	Cambridge Associates, de-smoothed	Cambridge Associates US PE Index, de-smoothed	Quarterly	USD	5.61%	5.61%	5.91%	12.73%
Real Estate	EPRA INDEX / 2	FTSE EPRA Nareit Developed Europe Index / 2	Monthly	EUR	3.00%	4.50%	4.90%	9.18%

Correlation Matrix	BTP 7-10Y	Euro AAA 20+	Cash	EUR IG Corporate Financials	EUR IG Corporate Non-Financials	EUR HY	Global Equity	Private Debt	Private Equity	Real Estate
BTP 7-10Y	1.00									
Euro AAA 20+	0.41	1.00								
Cash	-0.02	0.10	1.00							
EUR IG Corporate Financials	0.42	0.12	-0.29	1.00						
EUR IG Corporate Non-Financials	0.58	0.45	-0.03	0.60	1.00					
EUR HY	0.09	-0.25	-0.31	0.62	0.58	1.00				
Global Equity	0.06	-0.35	-0.52	0.67	0.24	0.74	1.00			
Private Debt	0.28	-0.07	-0.35	0.84	0.68	0.93	0.77	1.00		
Private Equity	-0.14	-0.49	-0.52	0.39	0.17	0.77	0.85	0.67	1.00	
Real Estate	0.28	-0.05	-0.49	0.64	0.37	0.68	0.79	0.74	0.64	1.00

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Neuberger Berman
1290 Avenue of the Americas
New York, NY 10104-0001

www.nb.com