Insights

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Strategic Asset Allocation — A Comprehensive Approach

Investment risk/reward analysis within a comprehensive framework

- *There is a heightened emphasis on risk and capital management within the insurance industry. This is largely driven by the unanticipated loss experience on both the asset and the liability sides of insurers' balance sheets over the past few years, together with the increased scrutiny that rating agencies and regulators have generated. Insurers increasingly are turning to Enterprise Risk Management (ERM) frameworks and Economic Capital Modeling (ECM) to support decision-making and risk management. Strategic Asset Allocation (SAA) is an important extension of insurer's risk modeling initiatives.*
- *This paper reviews approaches to investment risk/reward analysis in a constrained environment, with specific emphasis on how SAA can benefit from and leverage a company's ERM and ECM platforms. We also touch on how a company can use its SAA applications to support rating agency and regulatory Use Test requirements. The paper offers Conning's approach to SAA, as well as insights that can be gained from this type of analysis.*

Introduction

Enterprise Risk Management is an all-encompassing approach that integrates every aspect of a company's functions in order to identify and manage both internal and external risks to an organization. The use of internal models to support economic capital calculations and ERM is becoming more commonplace within the insurance industry. Regulators and rating agencies are placing greater reliance on internal models in their assessment of a company's financial strength and solvency. To help validate that these internal models are robust, regulators and rating agencies are asking companies' managements to provide evidence that they are using these models as a core part of their strategic financial decision-making process. This requirement commonly is referred to as the "Use Test." Strategic Asset Allocation, a critical part of an insurance company's business strategy, can be an effective application for supporting Use Test requirements.

While the underlying financial modeling frameworks for capital management and investment analysis are similar, there are important nuances that make strategic investment analysis different from those applications that support capital management. Recognizing these differences is key to more effective investment analysis.

Strategic Asset Allocation involves the exploration of the risk and reward tradeoffs associated with different asset allocation alternatives. The goal is to maximize the reward potential of the selected investment strategy while minimizing exposure of the company to unacceptable or unanticipated risks. The basic process requires: 1) establishing the trading rules that will govern the implementation of the investment strategy, 2) setting the environment under which the alternative investment strategies are evaluated, and 3) identifying a company's objectives, constraints, and risk tolerance.

This paper discusses the following:

Section I: Implementation considerations as they relate to different investment strategy methods

Section II: Economic scenario generators (ESG) and the various considerations that go into setting economic and capital market assumptions for SAA purposes

Section III: The importance of setting appropriate objectives, risk tolerance levels, constraints, and time horizon

Section IV: Some basics associated with investment optimization and the generation of an efficient frontier

Section V: Conning's approach to SAA

Section VI: Differences between SAA and ECM that insurers need to understand and incorporate, as well as document in order to satisfy Use Test requirements

I. Investment Allocation — Implementation Considerations

An early step in an investment allocation analysis requires defining how investment strategies will be managed and implemented. This involves the important consideration of strategic versus tactical asset allocation and how each factors into the investment allocation process.

A. Strategic Asset Allocation

Strategic Asset Allocation applies rules-based investment strategies to define long-term investment allocation goals that are designed to maximize a company's reward objectives subject to its tolerance for risk. It is based on expected risk and reward assumptions that are consistent with financial theory and informed by historical relationships among asset classes. It is also free from judgments that involve short-term value assessments on particular asset classes, sectors, and individual securities. The objective function used for Strategic Asset Allocation purposes could be based on investment-only considerations or, more commonly within the insurance industry, could account for a company's liabilities, capital structure, and business plans.

Investment strategies come in many shapes and sizes. Defining the specific implementation strategy that will be the basis of a company's investment process is an initial step in the design of an asset allocation framework that will provide the necessary insights to make appropriate strategic investment decisions.

(i.) Constant Mix Strategies — allocation strategies that are constant over time

Constant mix strategies can be applied to total invested assets or to cash as it becomes available for investment. If a constant mix strategy is applied to available cash, then it is referred to as a "buy and hold" strategy. Under a constant mix buy and hold strategy, the allocation for investing new cash is constant over time; however, the asset allocation of the entire pool of invested assets will vary as the older investments change in value and decrease in maturity.

If the desire is to have a constant mix strategy for the entire investable asset balance over time, then a rebalancing strategy needs to be implemented. A rebalancing strategy will invest new cash and buy or sell existing assets such that the overall asset allocation stays constant. Rebalancing can be undertaken on a periodic basis (e.g., monthly or quarterly) or can be based on the overall asset allocation percentages penetrating a specified tolerance level (e.g., an allocation is more than 5% away from the target allocation). Constant mix strategies with rebalancing lend themselves to benchmarks and performance measurement and thus are commonly used within the insurance industry.

We can illustrate the impact of constant mix strategies on the total portfolio's asset allocation over time with a simple example. Assume that Company A, with annual cash flows of $100, follows a buy and hold strategy, and invests 80% in 5-year zero coupon bonds and 20% in stocks. Company B invests the same $100 annual cash flows using the same 80% bond/20% stock strategy but follows a constant mix rebalancing strategy. Further, assume that the annual returns on the bond and stock portfolios are as follows:

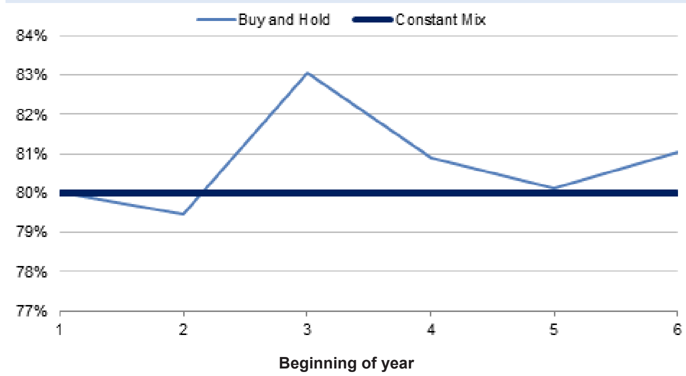
Exhibit 1: Annual Returns (Assumed)

	Year 1	Year 2	Year 3	Year 4	Year 5
Bonds	1%	-2%	5%	3%	1%
Stocks	8%	-20%	15%	7%	-5%

Prepared by Conning. Source: Conning, Inc.

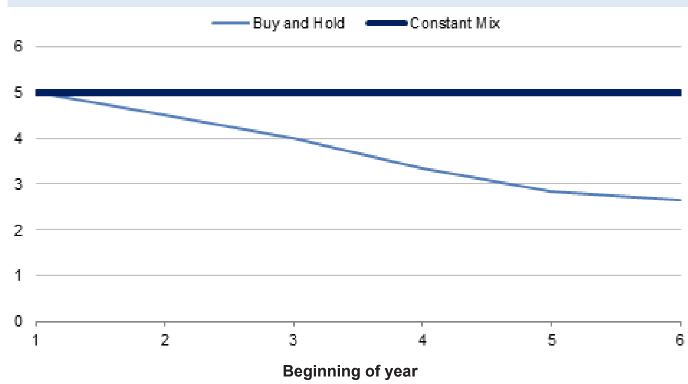
The bond allocation and bond duration for these two strategies would follow the patterns illustrated in Exhibit 2 and Exhibit 3.

Exhibit 2: Bond Allocation



Prepared by Conning. Source: Conning, Inc.

Exhibit 3: Bond Duration



Prepared by Conning. Source: Conning, Inc.

As these exhibits show, the year-to-year investment strategies under a buy and hold versus a constant mix rebalancing strategy can be significantly different. The annual allocations and bond duration patterns for the buy and hold investor (Company A) would further change from those depicted above depending on the operational cash flow that was available to invest as well as the actual annual returns that were realized.

(ii.) Dynamic Trading Strategies — allocation strategies that change over time in response to business, economic, or capital market conditions

Examples:

1. Allocations that are a function of capital (e.g., equity allocation equal to 25% of surplus)
2. Allocations that are a function of liability duration (duration matching, hedging)
3. Allocations that protect against a loss of a certain size (constant-proportion portfolio insurance)

Dynamic trading strategies, by their very nature, are always changing and can be difficult to optimize and implement due to the vast number of possible trading rules that one can use to implement these strategies.

B. Tactical Asset Allocation

Tactical asset allocation differs from Strategic Asset Allocation in that it applies value assessments on asset classes, sectors, and individual securities in the investment allocation process in an attempt to generate returns (alpha) in excess of static rules-based investment strategies (e.g., active management versus indexing). In other words, tactical asset allocation involves short-term changes in allocations based on perceived market anomalies. Absolute return strategies are, in essence, extreme forms of tactical asset allocation strategies in that they use a variety of different trading techniques and derivative instruments in an attempt to achieve positive returns under any economic and capital market environment. Tactical asset allocation strategies do not lend themselves to analysis within the type of modeling systems used for financial risk management, however, because the latter systems are not designed to identify under- or over-valued investment opportunities.

II. Strategic Asset Allocation — The Use of Economic Scenario Generators for Setting Economic and Capital Market Assumptions

An economic scenario generator (ESG) is a software tool that simulates future economic scenarios and the risks embedded in them. An ESG feeds into the broader ERM framework and informs risk-based decision-making, and so is a critical component of the suite of models that analyze the external risks to an organization. Specifically, an ESG is the basis for projecting economic and capital market scenarios for use in financial risk management applications such as Strategic Asset Allocation. There are two common applications that are driving the increased use of ESGs:

- Market-consistent valuation work for pricing complex financial derivatives and insurance contracts with embeded options ("market-consistent" models)
- Risk management work for calculating regulatory capital and rating agency requirements ("real-world" models).

The increased use of ESGs, in turn, is driving the need for more sophisticated models that can satisfy the multi-faceted demands of the financial services community.

A. Market-Consistent Models

Market-consistent valuation applications require ESGs to be capable of generating scenarios that can reproduce the observable prices of traded derivative instruments. These same scenarios are then used to determine comparable prices for derivative instruments and insurance contracts with embedded options that are not traded, but that require market valuation. The process of parameterizing an ESG to reproduce observable prices of traded derivative instruments is referred to as "model calibration." ESGs that are used for these purposes need to adhere to strict mathematical properties that are designed to satisfy risk-neutral and arbitrage-free conditions. Because the model calibration process is designed to reproduce the prices of traded derivatives, the ultimate calibration is dependent on both the pricing date and the set of traded derivatives used to calibrate the model. The validation associated with the model calibration is based on how well the model reproduces the market values of the universe of traded derivatives used to calibrate the model.

B. Real World Models

Risk management applications, in contrast, require ESGs to be capable of producing dynamics (e.g., volatility, correlations) that are representative of the possible future paths of economic variables. Commonly referred to as "real world" calibrations, they enable the "what if" questions by management as it tries to gauge the likelihood of future events and the impact on its business. To distinguish real-world calibrations from market-consistent calibrations, we refer to the real-world calibration process as "model parameterization." Because real world parameterizations are forward looking, they require explicit views as to how the economy will develop in the future and, as such, require a significant amount of expert judgment[1] to determine the plausibility of the scenarios that result from the parameterization process. In practice, real world calibrations often are parameterized to be consistent with historical dynamics of economic variables, although the long-term steady state levels associated with these parameterizations can differ from long-term historical averages in favor of current consensus expectations.

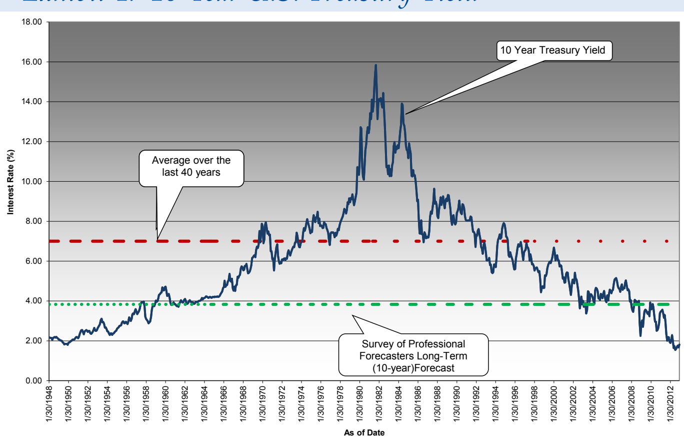
[1]We define "expert judgment" as the application of economic and financial expertise and knowledge to decision-making across a wide variety of arbitrary situations where the outcome is critical to the integrity of the ESG. For a detailed discussion, see Conning's The Importance of Expert Judgment in Generating Economic Scenarios (February 2013).

Parameterizations of real-world ESG models require the user to make choices about the future economic environment that they want to reflect in their risk analysis work. Some of the key decision points when parameterizing a real-world model include (i) selecting the appropriate steady state levels, (ii) determining the appropriate values for the initial conditions, (iii) identifying the key parameterization targets or "stylized facts" that are necessary for the application, (iv) controlling the expected reversionary paths of economic variables, and (v) general assumption considerations. We discuss these below and make note of specific considerations related to SAA applications.

(i.) Selecting the appropriate steady state levels

One can set the steady state levels based on historical averages over some specified period, on consensus long-term economic forecasts, or on a particular company or economic viewpoint. Exhibit 4 shows the type of information that might be used to help set the assumed steady state level of 10-year U.S. Treasury yields within a company's ESG model parameterization. The exhibit shows that 10-year U.S. Treasury yields have ranged between 2% and 16% since 1948 and that the average yield over the past 40 years has been 7.0%. In addition, the Philadelphia Federal Reserve's Survey of Professional Forecasters provides a long-term forecast for the 10-year yield of 3.83%. This variability demonstrates the challenges the model user faces in selecting appropriate assumptions for risk management applications. The steady state level that is ultimately selected will need to involve expert judgment and will be dependent on the specific application for which the model is being built.

Exhibit 4: 10-Year U.S. Treasury Yield



Prepared by Conning. Sources: Conning, Inc.; ©2013 Bloomberg L.P.; Federal Reserve Bank of Philadelphia; Survey of Professional Forecasters (https://www.philadelphiafed.org/research-and-data/real-time-center/survey-of-professional-forecasters) (2013)

(ii.) Determining the appropriate values for the initial conditions

Depending on the particular application, it may be appropriate to set the initial conditions consistent with a particular historical date (e.g., for financial valuation), a set of hypothetical starting conditions (e.g., for sensitivity testing), or at their steady state levels (e.g., for SAA). The latter option is useful to explore risk management strategies that do not depend on an assumption of an upward or downward bias in key economic metrics, such as capital losses on bonds resulting from rising interest rate projections.

(iii.) Identifying the key parameterization targets or "stylized facts" that are necessary for the application

ESGs need to balance complexity and practicality. The historical data can generate an infinite number of statistics, but to keep the models academically credible yet appropriate for practical application, it is necessary to limit the factors used to describe the underlying dynamics of the modeled economic variables. As a result, it is not feasible for these models to hit every parameterization target or capture every stylized fact (i.e., historically observed relationship). Expert judgment is thus used to determine which targets are most important for an intended application. Short-term tail events may be deemed more critical for one-year regulatory capital calculations, whereas long-term mean and standard deviation measures may be of greater importance for strategic investment analysis. The importance placed on these different parameterization targets can have a material impact on the final model calibration and its applicability for specific risk management applications.

(iv.) Controlling the expected reversionary paths of economic variables

Given a set of initial conditions and expected long-term steady state levels, a real-world ESG model will generate a set of scenarios that move from initial levels to their steady state levels over time. These mean reversion dynamics are often calibrated to be consistent with historical reversionary dynamics. While this base case reversionary movement is appropriate for many risk management applications, some users of ESG models may want to reflect expected movements that differ from those implied by the modeled mean reversion parameterization. As an example, users may want the expected movement of economic variables to follow some specific internal or external economic forecast. To the extent that such a specific economic forecast is desired, the model will need to be capable of overriding the base case behavior with some user-specified path. This is typically accomplished by shifting the default scenarios in such a way as to "hit out" to a user-specified path. Alternatively, one could attempt to change the internal model parameters to change the base case behavior, but this would be an extremely difficult task for most ESG users.

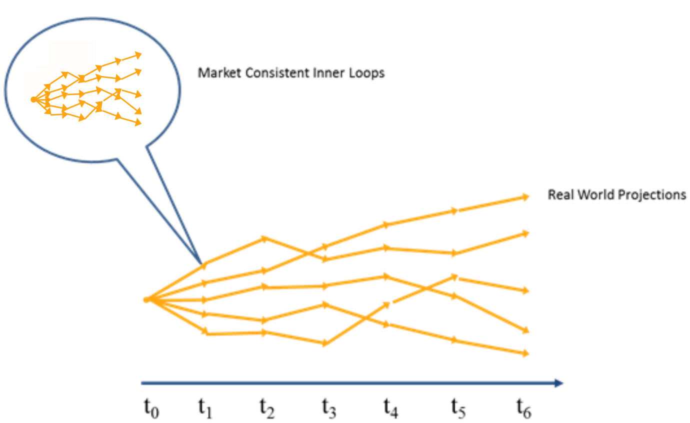
(v.) General assumption considerations

The considerations of steady state levels, initial conditions, stylized facts, and reversionary paths demonstrate that, when setting economic and capital market assumptions, the appropriate scenarios to use for a particular analysis will depend on what a company is trying to accomplish. Scenarios used for regulatory capital assessments and stress testing require particular attention to extreme events, and the focus thus tends to be on the tails of the distributions. Business planning requires consistency with initial economic and capital market conditions, along with a forecast of the expected future path of the economy that is consistent with internal company viewpoints. Strategic risk analysis, which includes Strategic Asset Allocation, more often concentrates on risk as it relates to the entire distribution of outcomes, and replaces specific individual company viewpoints with a steady state view of the economy and capital markets that reflects a neutral or consensus perspective.

C. "Nested Stochastics" — Combining Market-Consistent and Real World Applications

As technological advances facilitate greater computational power and speed, the combination of real-world projections with market-consistent valuations at future valuation dates becomes more of a practical reality. This concept is commonly referred to as "nested stochastics." Nested stochastic capability is an effective technique for valuing complex financial derivatives and insurance contracts with embedded options at future periods. Nested stochastics involve projecting a set of real world economic scenarios and, at each future real world projection node, a set of market-consistent scenarios is projected and used to calculate the future value of financial derivatives and/or insurance contracts with embedded options. (As an explanatory note, the concept of stochastic modeling refers to a mathematical process that combines probability theory with random variables to forecast financial performance; as the name suggests, nested stochastics are stochastic models inside of stochastic models.)

Exhibit 5: Nested Stochastics



Prepared by Conning. Source: Conning, Inc.

It follows from the above discussion that using an ESG for market-consistent valuation or risk management applications requires more than one calibration and parameterization. It thus becomes imperative for the user of an ESG – or the scenarios it generates – to have a thorough understanding of the underlying calibration and/or parameterization criteria that form the basis of the economic scenarios and to evaluate that those scenarios are appropriate for the particular application being analyzed. Model assumption changes, while often necessary to achieve the objectives of different risk management applications, need to be justified and appropriately documented to satisfy regulatory and rating agency Use Test requirements.

III. Strategic Asset Allocation — Objectives, Risk Tolerance, Constraints, Time Horizon

The SAA process is based on an understanding of the objectives and risk tolerance of a company as well as its constraints and time horizon. These considerations help determine the metrics that will be most important in evaluating alternative strategic investment allocations. A clear understanding of the company objectives also helps management to think through, focus on, and communicate how the strategic decisions that they are making support profitability and financial strength. These items typically are stated in terms of financial statement results and, once determined, provide a common set of metrics that management can apply to all of the company's strategic financial decisions.

(i.) Objectives and risk tolerance

There are many objective functions (risk and reward measures) that can be used for evaluating strategic initiatives. An objective function can be extremely complex or relatively simple. In traditional asset-only efficient frontiers, objective functions typically are defined as total investment return (reward measure) and the standard deviation of the investment return (risk measure). In an asset/liability modeling framework, an equivalent objective measure might be a company's economic value as the reward measure and the standard deviation of economic value as the risk measure. Other common reward objectives are policyholder surplus, shareholders' equity, and present value of distributable earnings (PVDE). Various downside risk measures can be substituted for standard deviation as the risk measure, or company-specific risk/reward functions can be defined.

For regulatory and economic capital modeling applications, the key measure of interest tends to be extreme tail events, such as the "1-in-200" economic capital measure that is the required capital calculation under Solvency II regulations (reflecting the probability of a company having sufficient capital to support its risk-taking activities over a one-year period). Strategic Asset Allocation applications, while interested in the extreme tail metrics, tend to be more focused on expectations and what is happening across the entire distribution of financial results. Thus, standard deviation is the common risk metric and total investment return is the traditional reward metric for asset allocation studies. The risk metrics have been further extended in an asset/liability context to include measures of economic value, which factor in a company's liabilities, capital structure, and even the value of its ongoing operations.

(ii.) Constraints

Constraints are specific metrics that must be satisfied, but, unlike objectives, which are maximized or minimized, they are binary conditions that are either met or not met. Investment strategies that do not satisfy a particular constraint are invalid and excluded from consideration in identifying efficient and optimal investment portfolios. Despite their binary nature, constraints can be simple (e.g., no more than 20% of the available assets can be invested in equities), or complex (e.g., the duration of the fixed income assets must be greater than two but less than five). Constraints allow companies to gain comfort that the efficient investment strategies that are identified will satisfy internal and external investment and regulatory requirements.

(iii.) Time horizon

Time horizon is another important consideration when setting an investment strategy, for different investment strategies will be more or less attractive from a risk/reward perspective depending on the time horizon over which they are evaluated. The time horizon is usually set to be consistent with the period over which the assets are being put to work; this could be a period that ties to a company's strategic planning horizon, set to the product life cycle, or a period equal to the duration of the existing reserves. Whatever the basis for setting the time horizon for Strategic Asset Allocation analysis, rarely would it be as short as the typical one-year time horizon that is used for many regulatory economic capital modeling applications. Using a longer time horizon for Strategic Asset Allocation purposes does not prevent the use of shorter-horizon metrics as constraints.

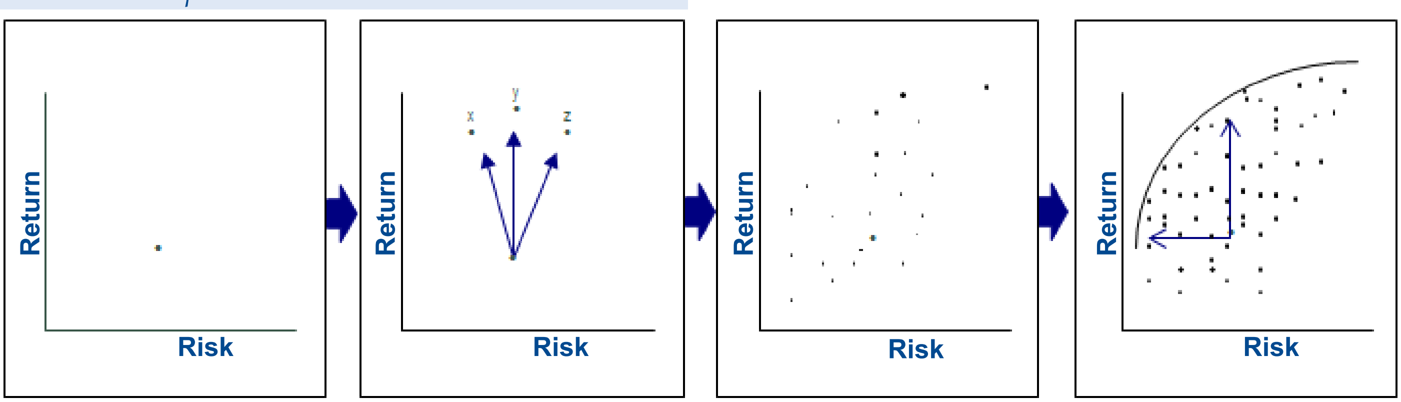
IV. Strategic Asset Allocation — Investment Optimization and the Efficient Frontier

Strategic Asset Allocation involves evaluating the investment and financial implications of alternative asset allocation strategies in an attempt to maximize a company's specific business objectives while staying within its identified risk tolerance. The strategy that does the best job of satisfying both the company's objectives and risk tolerance is referred to as the optimal investment strategy. Finding the optimal investment strategy can be achieved with a financial projection model by evaluating pro-forma financial results of numerous alternative investment strategies and selecting the strategy that produces results that are closest to the desired objectives and risk tolerance. However, this brute force process is tedious and does not assure that any of the strategies under evaluation are technically efficient, much less optimal.

A more robust method of identifying efficient investment strategies is to use a stochastic optimization engine. These engines are designed to quickly evaluate thousands of different investment strategies and identify those strategies that provide the maximum reward for a given level of risk. The set of all portfolios that maximize reward at different levels of risk is referred to as the efficient frontier.

While all investment strategies that make up the efficient frontier are efficient by definition, there is only one strategy that is optimal. The optimal investment strategy is the highest-re-

Investment Optimization



warding efficient investment strategy that satisfies the company's specific risk tolerance.

V. Conning's Best Practice Strategic Asset Allocation Checklist

Having discussed the components of SAA — implementation considerations; economic and capital market assumptions; objectives, risk tolerance, constraints, and time horizon — we now summarize guidelines that define Conning's approach and that we believe are critical in achieving an optimal allocation of assets.

- Use constant-mix strategies to establish benchmarks and performance measurement — Benchmarks are a standard part of the investment management process, providing actionable instructions about investment strategy to the investment professionals and giving management a means to evaluate the performance of the manager's tactical deviations.
- Define an objective that considers liabilities and capital structure — Optimizing investment risk/reward expectations from an investment-only perspective will not necessarily optimize the economic value of a company. Liabilities and capital structure have a significant impact on an insurer's optimal investment strategy.
- Factor in ongoing business plans — Duration management, liquidity, and profitability are important factors in determining an optimal investment strategy, and a company's business plan can significantly affect these factors. Ignoring cash flows from future business can lead to overly conservative and sub-optimal investment strategies. Care should be taken that new business is included, because it introduces additional assumptions about the future that need to be appropriately sensitivity-tested.
- Use a time horizon that is consistent with a strategic planning horizon or liability duration — Selecting the appropriate time horizon is a major part of the strategic asset allocation process. The luxury of time allows a company to capture the increased reward expectations associated with higher-risk assets. However, as time horizon increases, the business plan becomes less certain. Using a time horizon consistent with your business planning or liability duration tends to appropriately balance long-term value creation with short-term operating constraints.
- Reflect a reasonable consensus economic and capital market viewpoint — Reasonability is in the eye of the beholder, but setting asset strategy based on viewpoints that deviate substantially from the consensus opinion runs the risk of mixing strategic asset allocation with tactical positioning. If the investment professionals further overlay a tactical position onto the strategic benchmark, then the company runs the risk of doubling up on tactical views.
- Concentrate on investment strategies that produce sound economic value results – There are many valid reasons for the rules that make up accounting standards, but none of them were designed for strategic asset allocation purposes. Economic results remove the smoothing mechanisms inherent in many of these accounting rules and thus provide a truer measure of value creation.
- Factor in accounting and regulatory considerations as constraints — While economic measures may be purer than accounting measures, insurance companies are still constrained in what they are able to do based on accounting implications. Accounting metrics thus are still important to analyze when putting together an optimal investment strategy.
- Make sure that the recommended investment strategies are implementable – An implementable investment strategy allows an insurer to realize the expected risk/reward benefits of the strategic asset allocation process. Custom benchmarks and investment policy and guideline revisions assure that the strategic allocation can be put to work to achieve the desired benefits from the investment portfolio.
- Understand the difference between efficiency and optimality — efficiency involves achieving the greatest reward for the level of risk being undertaken but says nothing about how much risk *should* be taken. Optimality involves finding the efficient asset allocation strategy that satisfies company risk tolerance constraints.

VI. Summary of Key Differences Between SAA and ECM Modeling

An objective of this paper has been to demonstrate that financial risk modeling can provide a solid basis for investment allocation analysis, albeit with important differences. Before we summarize the key differences between SAA and ECM modeling, it is worth noting the commonalities that are critical for the satisfaction of Use Test requirements. Insurers can benefit from using the same assumptions and modeling methodologies for both SAA and ECM; this is highly desirable for supporting Use Test requirements, because it demonstrates that management has sufficient confidence in the internal risk management platform to use it for the important task of setting investment strategy. Because both applications use common elements, there is less need to discuss model methodology differences that may result from using different models, assumptions, and methodologies for these different applications. The Use Test documentation thus can concentrate on the necessary differences as they relate to the application-specific model assumptions. Furthermore, the results generated from the Strategic Asset Allocation analysis easily can be run through the company's economic capital model to provide yet an additional link between the two applications and provide further ammunition to satisfy the Use Test requirements.

Noteworthy differences between SAA and ECM applications are:

Financial metrics of interest — ECM typically concentrates on economic or solvency capital as its core metric; SAA objectives typically are broader and deal with many other financial variables. Key financial metrics for SAA analysis include accounting and regulatory surplus, income, cash flow, liquidity, investment statistics, and tax considerations.

Time horizon — ECM calculations that have their foundation in regulatory capital analysis are based on a one-year horizon. SAA tends to focus on both short-term and long-term horizons, enabling the analysis to be consistent with a company's planning horizon or the duration of its liability profile.

Primary risk measure — ECM specifically concentrates on the tail of the economic capital distribution; SAA looks across the entire distribution of each key financial metric, and deviations from expectations are every bit as important as tail risk.

Number of scenarios — Because ECM concentrates on tail risk, such analysis requires a large number of scenarios to obtain appropriate confidence that the calculated tail result is statistically significant. For SAA, fewer scenarios are required to determine, with statistical significance, which of two alternative investment strategies is more efficient.

Economic and capital market assumptions — ECM reflects initial conditions and market-consistent calibrations. SAA reflects real-world risk and return assumptions that are based on history or prospective viewpoints. SAA analysis often will be performed using a steady-state economic and capital markets environment.

Valuation versus optimization — ECM requires the prospective valuation of a company's existing business strategy; SAA evaluates a large number of alternative strategies in order to identify the most efficient risk/reward strategies using an efficient frontier framework. An optimal strategy is the most efficient strategy that satisfies the company's specific risk tolerance guidelines.

Accuracy versus insight — The objective of ECM is a single number that reflects the risk assumed within an insurance company and assures solvency at a specified probability level. As such, it tends to require significant attention to detail and often involves modeling at a very granular level. SAA is designed to provide insight rather than accuracy; the goal is to identify optimal investment strategies rather than precise calculations, and thus can be achieved using less granular model structures.

Summary and Conclusion

A number of factors have put the spotlight on risk and capital management among insurers – the continued globalization of the financial industry and the increasing complexity of products, the 2008 financial crisis, unanticipated losses on both the asset and liability sides of balance sheets, and the intensified scrutiny of rating agencies and regulators. More and more, insurers have turned to Enterprise Risk Management as a comprehensive framework for making decisions and managing risks across all functions of an organization. While financial risk modeling has been widely used in support of ERM and for regulatory capital requirements, it has been less often used as a tool for investment analysis. This paper has shown, however, an economic capital modeling system can be extended to provide a strong basis for investment analysis. Together with well-defined business objectives, risk tolerances, and constraints, a company can achieve an optimal allocation of assets and use Strategic Asset Allocation as an effective application in support of regulatory Use Test requirements.