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Enterprise Risk Quantification

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OVERVIEW

Insurance is a risk-taking business. As risk managers, we must ensure that the risks taken are intentional and understood, as well as aligned to the organization's objectives. This can be achieved only through a well-designed risk management framework, with effective governance and high-quality risk information. To provide management with the information it needs, risks should be quantified through various lenses, at aggregate and more granular levels. This article focuses on risk quantification at an enterprise level.

We will discuss two important risk quantification topics: economic capital and stress testing. Each provides management with different information needed to influence capital management, investment and other business decisions, and require coordinating information across the enterprise.

We will provide background on some of the factors driving risk management enhancements across the industry and the limitations of common industry approaches. Then we will discuss the purpose, key methodology decisions and practical challenges for economic capital and stress testing.

DRIVERS

Across the insurance industry, companies are enhancing risk management practices as they recognize both risk management's importance and increased regulatory focus. As the 2008 financial crisis unfolded, financial institution losses emerged in ways companies had not anticipated. Two risk quantification realities quickly became apparent to management and regulators alike. First, many companies did not have a framework in place to evaluate enterprise-level risk exposure to adverse environments. And second, many did not have the infrastructure in place to perform timely risk analysis.

Regulation of insurance companies with a U.S. presence varies based on the size and complexity of an organization and location of the parent company. With the emerging regulatory developments, most companies will soon fit into one of the following categories:

1. U.S. parent, not systemically important, no bank ownership — Legal entities are regulated by state regulators or local foreign regulators; group disclosures to state regulators
2. U.S. parent, systemically important or bank ownership — Group is regulated by the Federal Reserve; legal entities are regulated by state regulators or local foreign regulators; group disclosures to state regulators
3. European parent — Group is regulated per Solvency II; legal entities are regulated by state regulators or local foreign regulators; group disclosures to state regulators

Companies in each category are experiencing an increased regulatory emphasis on risk management, with different regulators introducing various requirements, some of which are similar. For instance, the U.S. insurance regulators will soon require that companies produce an Own Risk and Solvency Assessment (ORSA) report. To comply, U.S. companies must provide their internal

view on group-required capital and a prospective view of required and available capital in normal and stressed environments. Companies deemed systemically important financial institutions (SIFIs) by the Financial Stability Oversight Council (FSOC) or that own a bank will be subject to the Federal Reserve's Internal Capital Analysis and Assessment Process (ICAAP), for which a robust enterprise stress-testing framework is a key component. Finally, companies with European parents are preparing for Solvency II enterprise risk reporting,



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including economic capital, stress testing and capital projections.

Companies in the first group are subject to less rigorous and prescriptive requirements than those in the others, though additional factors may influence them. The U.S. ORSA will provide insurance regulators with a new window into risk management practices and quantification methods, and ensure that risk management topics are on board of directors' agendas. What boards or U.S. regulators will do with this information is not yet known, but it's preferable for companies to show regulators that they are on the leading side of industry risk management practices. Companies with more rigorous regulatory requirements—SIFIs and European subsidiaries—will redefine leading practices and place pressure on the rest of the industry.

LIMITATIONS OF EXISTING APPROACHES

Measuring risk exposure is hardly a new concept for insurers, though common industry approaches have limitations. Insurers often manage capital needs with frameworks based on U.S. risk-based capital (RBC) or rating agency benchmarks, quantify individual risks in silos with widely varying techniques, and lack the ability to aggregate risks across businesses or project full future balance sheets in adverse conditions.

State regulators designed RBC to provide early warning of financial trouble, but companies have often relied on it beyond its intended use, employing it as a primary capital adequacy measure. A company's position on RBC—and rating agency capital, which aligns closely to RBC—is a very real constraint, but it does not necessarily lend itself to understanding the company's specific risks. RBC is built on a U.S. statutory balance sheet, which is book-value-based and may show losses slowly over time. It also has known missing risks (e.g., longevity, operational) and is not tailored to the risks facing specific organizations. Finally, since it is applied at the insurance legal-entity level, risks taken by non-insurance entities (including the holding company) are not captured.

Additional, more economic risk exposure measurement techniques are also utilized but are often considered in risk silos (e.g., credit risk exposure), resulting in varying quantification approaches and levels of rigor. Limits are often applied for some risks and not others, and the individual risk quantification approaches are not linked to the overall company risk appetite.

An emerging leading practice is to produce a forward-looking projection of a company's balance sheet for various adverse scenarios under various accounting lenses (statutory, GAAP/IFRS, and/or economic). Although the value in the exercise is appreciated, few companies have robust stress-testing frameworks, and current capabilities have shortcomings. Projecting stochastically calculated balances, determining assumptions under stressed conditions and aggregating for the enterprise are some current challenges, resulting in slow turnaround times and use of shortcut methods that compromise accuracy.

EMERGING ENTERPRISE RISK QUANTIFICATION APPROACHES

Economic capital

Management must understand the organization's overall risk and whether taking that risk provides an adequate return. Capital frameworks measure exposure across quantifiable risks. Economic capital models can align with the organization's specific risks and objectives, provide a consistent view on the capital required to support those risks, and help inform management about risk and return trade-offs.

Economic capital is commonly understood to utilize a value-at-risk measure on the potential loss of market value balance sheet surplus. While a popular application—and the Solvency II definition—economic capital need not be constrained to this interpretation. Regardless of the precise methodology, any economic capital framework seeks to determine how much capital should be held to support the actual risks the company faces. The capital definition should be aligned to a company's risk appetite definition and its unique objectives.



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statutory-based framework may be utilized with a long-term run-off approach.

- *Risk measure and confidence level:* Regardless of the balance sheet and time horizon, a company must decide to what part of the tail it plans to measure exposure. While 99.5 percent value at risk is common, different confidence levels and risk measures (e.g., CTE98) could also be considered, depending on the valuation framework. Ultimately, the risk metric and confidence level should align to the unique objectives of each organization.

Once a methodology is agreed upon, implementing the approach presents challenges:

- *Management buy-in:* Building senior management understanding and buy-in is often the greatest challenge with economic capital. An economic capital model is only as useful as the management actions it influences. To make it more than a theoretical exercise, economic capital’s value must be demonstrated to management, and sometimes theoretical purity must be sacrificed for ease of understanding.
- *Risk distributions and aggregation:* Capital calculations, by definition, seek to measure potential losses in risk distribution tails. Unfortunately, limited data exists to understand and illustrate the actual shapes of the tails and how risks are correlated within them. These assumptions typically require significant judgment and have greater uncertainty. It is instructive to perform calculations for a range of assumptions to understand the sensitivity of the results and where significant model risk may be present.
- *Coordinating across the organization:* Insurance companies are generally organized around multiple business units and corporate functions, each with responsibility for balances that feed the enterprise results. To produce meaningful and timely results, the capital modeling approach must be consistently applied across the organization and be efficiently aggregated.

Some key, and interrelated, methodology decisions are as follows:

- *Valuation framework:* Commonly economic capital frameworks utilize observable market variables to value assets and liabilities. Alternatively, an economic balance sheet can be defined with a discounted cash flow approach using current, but not necessarily market-consistent, assumptions. Because of their book value principles, GAAP and statutory balance sheets do not capture risk if required capital is quantified in terms of short-term losses.
- *Time horizon:* Most commonly economic capital is defined by the potential loss over a one-year horizon, where the market value at each point in time reflects the full tail of the liabilities and the applicable risk margins. A run-off approach is sometimes used that could focus on how cash flow or surplus emerges over a long-term projection, but companies typically prefer the simplicity of a short-term approach. The time horizon should be linked to the valuation framework. For example, a market-consistent valuation framework is commonly used with a short-term horizon, where a

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Stress testing

Stress testing is a powerful tool to supplement a company's internal capital model due to its conceptual simplicity. Stress-testing results are easy to explain to senior management and can drive home an understanding of a company's most material risk exposures. The approach does not attempt to capture all quantifiable risks, but instead illustrates the future financial impact over several periods of adverse, yet plausible, scenarios involving one or more risk factors. Executives hesitate to act on measures they do not fully comprehend—like a diversified 99.5 percent value-at-risk measure on an economic balance sheet, for example. Conversely, “If this economic scenario unfolds over the next several years, here's how our balance sheet will look” can be powerful enough to drive management actions.

A forward-looking stress test projects a balance sheet for a given adverse deterministic scenario. Consider the following in such an approach:

- *Balance sheet:* Any balance sheet definition that is important to the organization (e.g., GAAP, statutory, economic) should be considered. The Federal Reserve's Comprehensive Capital Analysis and Review (CCAR) framework is built around a GAAP balance sheet, but for some organizations statutory and/or economic balance sheets may take priority.
- *Income statement:* For companies utilizing a GAAP-based stress-testing approach, the balance sheet and income statement respond differently to market changes (e.g., unrealized gains flow through other comprehensive income rather than net income). Typically a projected balance sheet is the test's focal point, but management also values understanding the income impacts.
- *Scenario types:* The risk materiality should drive the scenarios selected. This will vary by company, though commonly market risk is the most material and scenarios are hence focused on market events.
- *Scenario quantity:* No absolute rules exist for the number of scenarios. Companies should use

enough scenarios to cover the most material risks, but not so many that the message gets lost.

- *Projection length:* The emerging consensus is to project the balance sheet for the business planning period (typically three to five years) since the purpose of the exercise is to inform management decisions.

Stress testing, while simple in concept, can be a challenging to implement. An insurance company balance sheet is complicated enough to calculate at a point in time; calculating it several years in the future in severe market conditions is even more difficult. Some particular challenges are:

- *Forecasting complicated balances:* Stochastic balances are particularly difficult to project, because they require stochastic-on-deterministic calculations. Additionally, the complicated and non-continuous rules in GAAP and statutory reporting (e.g., asset-adequacy reserves, Actuarial Guideline 43, Actuarial Guideline 38, GAAP loss recognition) present significant challenges. Well-designed processes and sufficient computing power are essential.
- *Setting assumptions for adverse scenarios:* Secondary effects of the scenario tested must be considered. For example, policyholder behavior will respond to adverse market environments. Assumptions for this are required for the models, but experience needed to set the assumptions probably does not exist. As a result, significant actuarial judgment is required, and a range of assumptions should be tested.
- *Precision level:* As noted above, precise calculations of future balances are not trivial, leading companies to rely on simplifications and rules of thumb. However, overdependence on such techniques can lead to answers that are less meaningful and can draw ire from regulators.
- *Coordinating across the organization:* The same coordination challenges noted for economic capital are present for stress testing as well.

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CONCLUSION

Both internal and external risk management drivers vary from company to company, but enhancing risk management is a common goal across the insurance industry. Producing high-quality risk information to inform management decisions is critical to an organization’s success. Risk management information must provide management perspective through various lenses and at various levels of detail.

Economic capital and stress testing both require coordination across the organization to provide management with vital risk information. There is no single correct approach and careful consideration is required both in setting up the right approach for the organization and the plan to implement. As the external environment and strategic objectives differ from organization to organization, so too should risk quantification.

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SAVE THE DATE

2014 Centennial Celebration
and Annual Meeting

New York City, NY – Hilton Midtown
November 9 – 12, 2014

The graphic features a blue background with a yellow rectangular area containing the CAS logo, the text "100 Years of Expertise, Insight & Solutions", and the large text "SAVE THE DATE". Below this, a black silhouette of a city skyline is shown. At the bottom, the event details "2014 Centennial Celebration and Annual Meeting" and "New York City, NY – Hilton Midtown November 9 – 12, 2014" are displayed in white and yellow text.