



SAS[®] OpRisk VaR for Financial Services

Analytical tools for generating useful intelligence from risk data

Overview

Financial services organizations are under increasing pressure from clients, regulators and volatile markets – to accurately anticipate the unknown, to gauge the likelihood of some future event by extrapolating from past events, to foresee and prepare for shifting conditions outside their span of control, or otherwise to be held personally accountable for the outcomes.

Yet in the face of these pressures, most financial institutions still operate under a silo approach in which departments and business units maintain their own data, analytics and assumptions for risk management – frequently inconsistently.

Even if they could be consistently applied across the enterprise, traditional risk management systems generally can't manage complex interdependencies among a multitude of risk factors – nor do they reflect the unique aspects of operational risk.

Are capital allocations too low, too high or just right? Are risk control measures effective? Could other mitigation approaches deliver better returns? Can these questions be answered in a way that meets all disclosure and reporting requirements?



Benefits

- Generate distributions corresponding to the frequency and severity of events for every cell in a matrix, and perform a VaR calculation within each cell.
- Integrate data from internal, consortium and public loss databases.
- Splice, dice, drill down, adjust, trend and plot operational loss data at will, following a fully transparent, intuitive and sequential process.
- Use what-if analysis to vary modeling assumptions to assess the sensitivity of VaR to different scenarios.
- Choose from a wide variety of statistical techniques.
- Calculate aggregate loss distributions using Monte Carlo simulation.
- Ease audit and compliance burdens by gaining full visibility into behind-the-scenes calculations.



The solution

SAS OpRisk VaR is just one component of SAS OpRisk Management, a complete operational risk management solution.

Built on the industry-leading SAS Business Analytics Framework, which integrates data management, analytics and reporting technologies, this solution includes three components designed specifically for managing operational risk:

- **SAS OpRisk Monitor** provides a unified environment for defining, collecting, tracking and reporting data on risks, causes, costs, key indicators and acceptable thresholds.
- **SAS OpRisk VaR** applies a wealth of analytics against known information to calculate reliable predictive insights.
- **SAS OpRisk Global Data** provides detailed information about more than 22,000 publicly reported operational loss events to enrich the statistical sample used for analysis.

How SAS® Can Help

SAS OpRisk Management provides a rigorous, scientific methodology for assessing and managing risk. The solution incorporates a broad range of analysis techniques to meet and exceed the best-practice recommendations of the Basel II Loss Distributions Approach.

SAS OpRisk VaR, a key component of SAS OpRisk Management, integrates risk indicators and control assessment scorecard results for dynamic modeling of operational VaR. Having an accurate picture of VaR enables you to optimize capital allocation to satisfy business best practices and regulatory requirements.

Interactive risk matrix

In a risk matrix presentation, rows are organizational units and columns are risk categories. Entries in each cell correspond to the number of event occurrences, mean loss and standard deviation of loss. Analysts can generate distributions corresponding to the frequency and severity of events for every cell in the matrix and perform a VaR calculation within each cell. A third dimension is available to model, for example, the legal entities within a group.

Merging internal and external data

SAS OpRisk VaR supports feeds from internal, consortium and public loss databases, as well as scenarios to enrich the statistical sample used for modeling. SAS OpRisk VaR is perhaps the only model that applies mathematically based “relative relations” techniques for mixing internal and external data. SAS algorithms resolve the normalization (scaling), control and reporting biases inherent in external public and consortium data.

SAS OpRisk VaR uses actuarial science techniques for modeling operational risk VaR in conformity with the Basel II Advanced Measurement Approach.

Flexibility and control in modeling

A user-friendly process provides access to multiple forms of mathematical and graphical analysis. Users can splice, dice, drill down, adjust, trend and plot operational loss data at will, following a fully transparent, intuitive and sequential process. Users control a full range of modeling parameters, such as how many trials to run, over which time period and how to display results.

What-if analysis

SAS OpRisk VaR lets you vary modeling assumptions to assess the sensitivity of VaR to different scenarios. For example, you could test VaR sensitivity to changes in underlying distribution assumptions, the value of certain losses, business line or event risk categories, or alternative risk mitigation and transfer strategies, such as whether or not to outsource or self-insure. All scenarios and assumptions are fully tracked for audit purposes.

Unprecedented choice in statistical techniques

SAS OpRisk VaR lets you exploit advanced maximum likelihood estimation (MLE) distribution-fitting techniques designed to work with a number of parametric families. You could, for example:

- Represent frequency distributions of loss events using Poisson, negative binomial, binomial, hyper-geometric or geometric methodologies.
- Represent severity distribution of loss events using log-normal, generalized Pareto, Burr, lognormal gamma (compound distribution), exponential, beta or Weibull techniques.

Monte Carlo simulation

Advanced VaR models calculate aggregate loss distributions using Monte Carlo simulation. Simulations can be run simultaneously using data sets that apply to multiple lines of business, each of which has had frequency and severity distributions fitted.

Results can be reported for each data set individually, for all data sets and for all levels of the organization's hierarchy, with some results being additive up the hierarchy and others not. An allocation methodology based on distortion functions is available once the VaR results are calculated.

Full visibility into model logic

SAS OpRisk VaR provides full visibility into the behind-the-scenes calculations – how knowledge about risk has been defined, measured, derived, distilled and displayed. This capability is crucial for audit review and for complying with the provisions of Basel II, Pillar 3: “Disclosure of Basel II Process.”

By creating a meaningful, organization-wide view of VaR, SAS OpRisk VaR enables risk managers, senior managers and analysts to improve risk processes and controls, optimize the allocation of capital reserves and mitigate the frequency and severity of risk events.

About SAS

SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions delivered within an integrated framework, SAS helps customers at more than 45,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW®.

www.sas.com



SAS Institute Inc. World Headquarters +1 919 677 8000

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