



SAS® Risk Management for Insurance

A comprehensive solution for performing risk analysis and risk-based capital calculations for both life and P&C insurance companies

What does SAS® Risk Management for Insurance do?

SAS Risk Management for Insurance is designed to perform risk analysis and risk-based capital calculations for both life and P&C insurance companies. The solution supports the standard model approach for Solvency II compliance. With the solution, you can perform:

- Enterprise risk data management.
- Market-consistent valuation of assets and liabilities.
- Stress testing and scenario analysis.
- Aggregation of risk capital charges.
- Calculation of Solvency Capital Requirements (SCR) and Minimum Capital Requirements (MCR).
- Regulatory and internal risk reporting.

Why is SAS® Risk Management for Insurance important?

Insurance companies conducting business in the EU must comply with the Solvency II regulations. Compliance with this legislation has presented a number of challenges to insurers. The solution provides senior management with a greater understanding of risk and the financial condition of the company.

For whom is SAS® Risk Management for Insurance designed?

The solution is designed for actuarial and investment analysts, risk analysts and managers, IT managers and senior managers.

SAS Risk Management for Insurance is a comprehensive solution for performing risk analysis and risk-based capital calculation for insurers. The solution enables life and P&C insurance companies to implement the Solvency II standard model approach for calculating risk-based capital and is built on a robust data management and reporting platform that includes an insurance-specific data model.

The solution has as its foundation the SAS Business Analytics Framework, which enables insurers to extend the solution's functionality to support the internal model approach for risk analysis, providing insurance companies with additional business benefit.

SAS Risk Management for Insurance addresses these critical areas:

- **Comprehensive data management.** Data integration typically accounts for up to 80 percent of a risk management project's costs. An integrated risk data warehouse that can deliver consistent and accurate data is fundamental for a successful risk solution implementation.
- **Risk analytics.** Insurers must perform complex calculations to anticipate risks and initiate control measures to maintain solvency ratios that meet regulatory specifications.
- **Risk reporting.** Standard and ad hoc reporting capabilities are critical for disseminating risk information to regulators for Solvency II compliance and senior management for improved risk decision making.

Key Benefits

Comply with Solvency II regulations

- Calculate standard model MCR and SCR requirements for solo entities and insurance groups.
- Create regulatory and management reports required for Solvency II.

Reduce volatility

- Improve risk decision strategies by gaining a greater understanding of how economic factors affect your balance sheet.
- Ensure solvency by stress testing your assets and liabilities against sudden and dramatic changes in market conditions.

Gain a greater competitive advantage

- Better allocation of risk-based capital charges enables you to lower your premium rates.
- Enhanced credit ratings improve the availability and price of debt.
- Obtain better investment performance by optimizing investment strategies.
- Reallocate capital and risk capacity for current and future business opportunities as needed.

Perform more accurate risk analysis with an enterprise data warehouse

- Comprehensive data management capabilities improve data quality by eliminating or reducing data inconsistencies.
- An insurance-specific data model serves as a single source of information.
- Prebuilt data management capabilities enable the loading of data from the data model to the risk solutions.



Lower your total cost of ownership

- A single solution provides comprehensive features – from data integration to risk analysis to reporting.
- The solution is flexible and extendible to meet the evolving risk analysis needs of insurance companies.
- The solution provides flexible integration with third-party risk software.

Solution Overview

The following modular applications comprise SAS Risk Management for Insurance:

- SAS® Firmwide Risk Management for Insurance.
- SAS® Market Risk Management for Insurance.
- SAS® Underwriting Risk Management for P&C Insurance.
- SAS® Underwriting Risk Management for Life Insurance.

Each application includes an insurance-specific data model, prebuilt data management capabilities, and risk analytical and reporting functionality.

Risk Data Management

SAS Risk Management for Insurance includes risk data management capabilities that enable insurers to acquire and consolidate historical data from internal and external sources for risk analysis and reporting. The data warehouse provides consistent and accurate data related to asset/liability exposures, claims, reinsurance arrangements, economic/actuarial risk factor assumptions and product configuration.

- **Risk data warehouse.** SAS Detail Data Store (DDS) for insurance serves as a single source of all the information for creating a risk data warehouse.
- **Advanced data quality.** Data quality tools provide the ability to eliminate or reduce data inconsistencies.
- **Prebuilt data management.** Provides capabilities to extract, transform and load (ETL) data from the SAS Detail Data Store to the solution's data mart.
- **Third-party integration.** Supports integration with third-party applications.

- **User security.** Enables creation and amendment of user security for access, authentication and authorization.
- **Audit functionality.** Enables creation and inquiry of automatic audit trails.

Risk Reporting

The solution's reporting capabilities and risk dashboards ensure that information is disseminated throughout the organization quickly and efficiently.

- **Web reporting tools.** Includes Web reporting tools for customized dashboards and ad hoc reports.
- **Prebuilt risk reports.** Includes prebuilt risk reporting data marts and more than 50 standard risk reports.

Solution Components

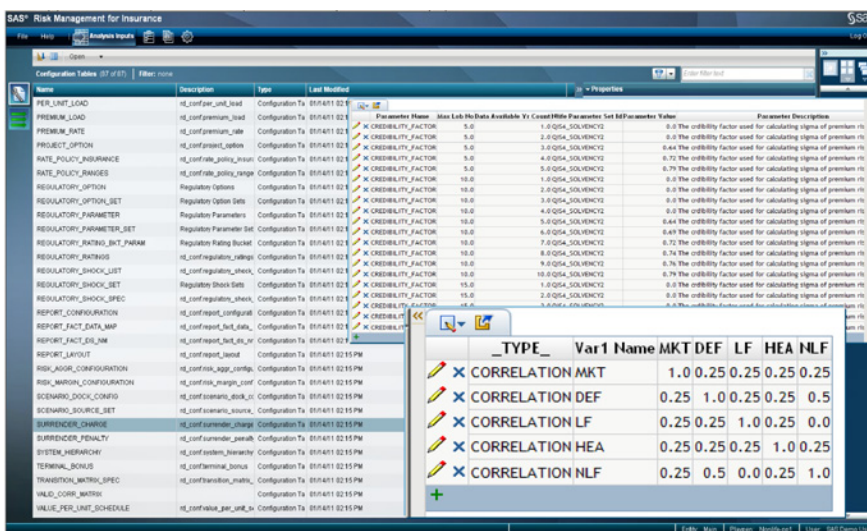
SAS® Firmwide Risk Management for Insurance

This component aggregates risk across the enterprise and calculates the quantitative measures required for Solvency II.

- Calculation of the Solvency Capital Requirement (SCR) and Minimum Capital Requirement (MCR) for solo entities and insurance groups.
- Calculation of risk capital charges for market, life, P&C, health, operational and counterparty default risk.
- Aggregation of risk capital charges across all risk modules.
- Risk margin calculation for non-hedgeable insurance liabilities.
- Calculation of reinsurance receivables.
- Calculates available capital and solvency ratio.

SAS® Market Risk Management for Insurance

Regulations and best practices require insurers to report the true economic value of assets and liabilities, including off-balance-sheet items. SAS Market Risk Management for Insurance allows risk analysts to configure and calculate



An intuitive interface lets users easily configure insurance products and parameters for risk analysis.

market value of financial instruments and assets – e.g., bonds, equity, derivatives, swaps and property. In addition, the solution:

- Supports a variety of financial instruments and property investments.
- Provides a rich library of functions that help in the rapid development of methods to value investment holdings.
- Performs mark-to-market valuation of all asset items.
- Performs stress testing for risk factors, such as interest rates, equity, currency rates and property rates.
- Provides support for a total economic balance sheet approach.
- Calculates and aggregates separate risk capital charges for factors such as interest rate risk, equity risk, currency risk, property risk and illiquidity premium risk.

SAS® Underwriting Risk Management for P&C Insurance

This component helps analysts blend actuarial and financial techniques to value P&C insurance liabilities on both an accident and underwriting year basis.

- Includes a prebuilt framework for rapid development of new methods for estimating P&C loss reserves.
- Calculates loss reserves using prebuilt techniques, including link ratio, chain ladder, Cape Cod and Bornhuetter-Ferguson.
- Calculates and aggregates separate risk capital charges, such as reserve/premium risk and catastrophe.

SAS® Underwriting Risk Management for Life Insurance

This component helps analysts blend actuarial and financial techniques to value complex life insurance liabilities. It supports the ability to configure valuation framework and project cash flows for a variety of individual life insurance

Key Features

Firmwide Risk

- Calculates Solvency II quantitative (Pillar 1) requirements – Solvency Capital Requirement (SCR) and Minimum Capital Requirement (MCR).
- Supports life, market, P&C, health, operational and counterparty default risk capital calculations.
- Aggregates risk capital charges across all risk modules.
- Calculates capital and solvency ratio.
- Calculates reinsurance receivables.

Market Risk Management

- Supports configuration of financial instruments and assets, including:
 - Bonds (fixed, variable, callable, corporate, etc.).
 - Equity – spot.
 - Derivative instruments with underlying equity, currency and bonds.
 - Credit derivatives.
 - Swaps (interest rate and currency).
 - Options on swaps, caps and floors.
 - Property.
- Supports stress tests based on interest rates, equity, currency rates and property rates.
- Calculates and aggregates risk capital charges.

P&C Underwriting Risk

- Prebuilt framework for estimating loss reserves.
- Calculates loss reserves using:
 - Link ratio.
 - Chain ladder.
 - Cape Cod.
 - Bornhuetter-Ferguson.
- Calculates and aggregates risk capital charges.

Life Underwriting Risk

- Values life insurance liabilities using an extensive library of functions.
- Performs stress testing based on mortality, disability, longevity, expenses and lapse rates.
- Supports with and without profit and separate account life policies.
- Calculates and aggregates separate risk capital charges.

Risk Data Management

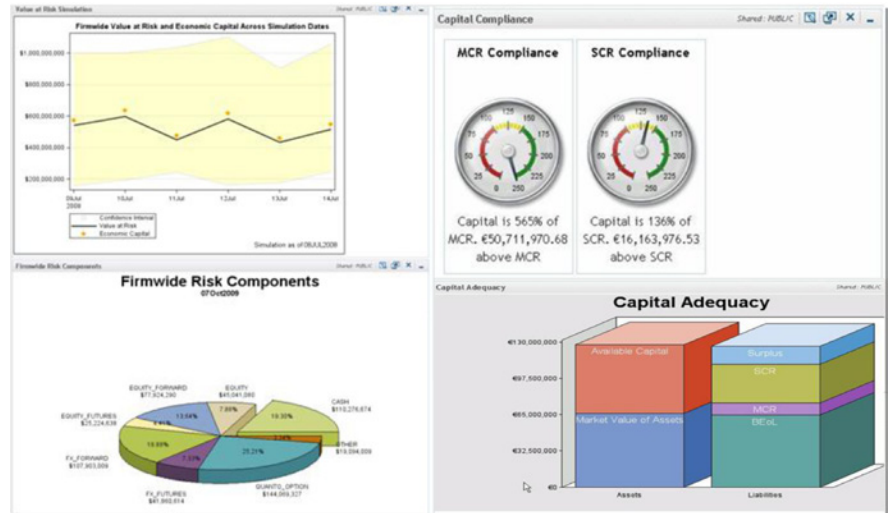
- Ability to read from and write to nearly any data on any technology platform, including Excel, Oracle, DB2, SAP and legacy systems.
- Embedded data quality processes.
- Extensive insurance data model.
- Supports integration with third-party solutions.
- User security – ability to create and amend user security for access, authentication and authorization.
- Prebuilt data management capabilities to extract, transform and load (ETL) data from DDS to solution data mart.

Risk Reporting

- Repository of more than 50 prebuilt reports, including:
 - Regulatory capital.
 - Technical provisions.
 - Statutory balance sheet.
 - Insurance groups.
- Intuitive Web-based query and reporting tool for business users to create, view and share ad hoc reports.

products, including term, annuity, whole of life and endowment products.

- Supports with and without profit life insurance products, as well as separate account life policies.
- Provides a rich library of functions that help speed the development of methods to value life insurance liabilities.
- Includes a user interface for performing stress testing for the following risk factors: mortality, disability, longevity, lapse rates and expenses.
- Calculates and aggregates separate risk capital charges for factors such as mortality risk, disability, longevity, expense risk and lapse risk.



A Web-based risk analysis and reporting user interface allows risk capabilities and reporting to be distributed efficiently across the organization.

SAS® Risk Management for Insurance System Requirements

To learn more about SAS Risk Management for Insurance system requirements, download white papers, view screenshots and see other related material, please visit www.sas.com/insurancerisk.