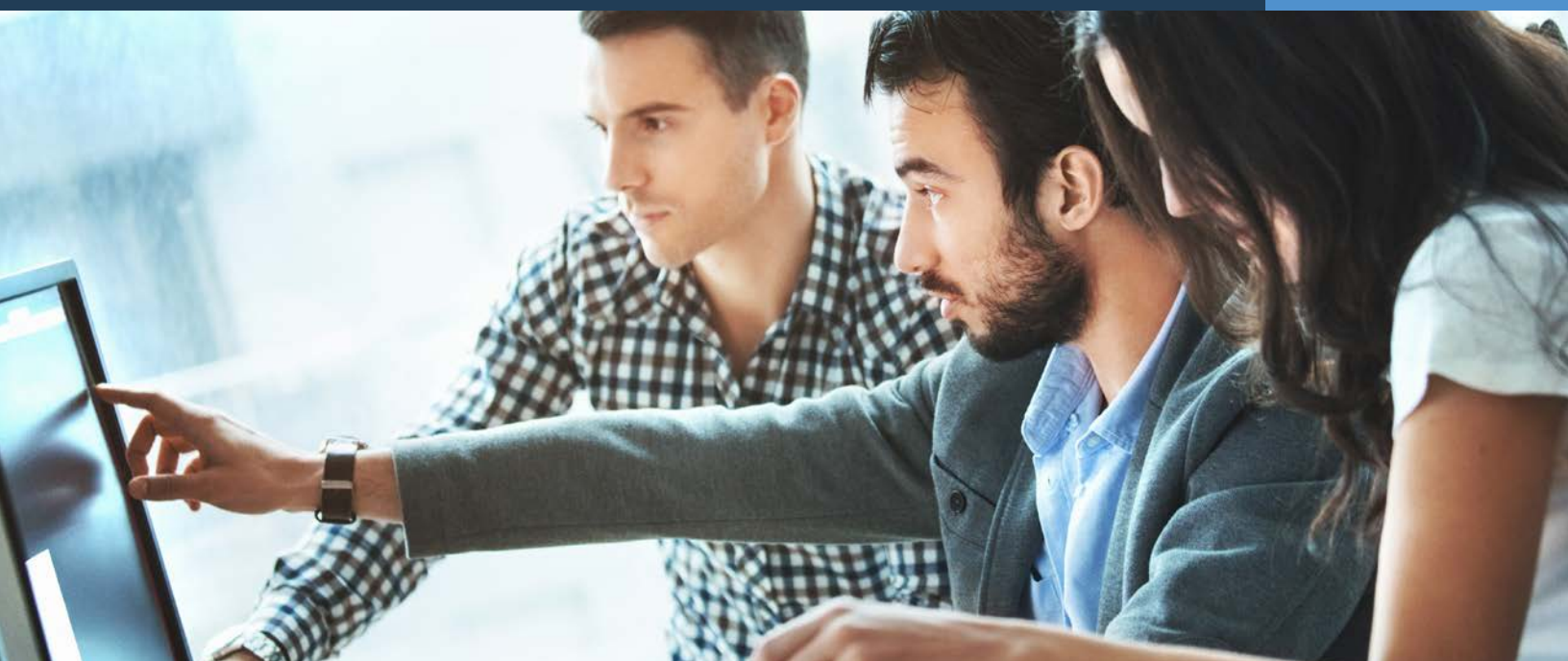


# Comprehensive Enterprise Stress-Testing Solutions

A portfolio for efficiently managing regulatory and internal stress-test programs



## Overview

Enterprise stress testing has become the de facto tool for managing systemic risk within the financial services industry. Today, not only is it the preferred supervisory tool across the globe, but institutions are increasingly adopting stress-testing tools and techniques to better inform their business decisions.

For many finance organizations, scenario-based stress-testing exercises remain a huge burden because they are still executed using a fragmented, inefficient approach. Most organizations use data, methods, processes and tools that are managed independently along product or organizational lines – and with limited central oversight. In addition, the workflows they employ are often resource-intensive, laden with manual processes and key person risks.

But enterprise stress testing doesn't need to be an organizational burden. What's needed is a more sustainable approach that replaces time-consuming, resource-intensive processes with a powerful, efficient solution for both regulatory and internal stress-test requirements.

The SAS® enterprise stress-testing solution can help. It combines a flexible analytics platform with best-in-class, feature-rich content to help you efficiently manage – and tailor – the entire stress-testing process to optimally support the unique requirements of your firm. It delivers centralized workflow orchestration, robust data handling, strong analytical capabilities, and a solid control and governance environment. And by integrating this solution with SAS Model Risk Management, you can reduce the effort needed to inventory, manage and monitor models over their entire life cycle.

## Business Benefits

With the SAS enterprise stress-testing solution, you can spend less effort producing results – and focus more on understanding and acting on the analysis. This allows you to elevate stress testing from a simple compliance exercise to a strategic tool for business advantage. You benefit from:

- **Streamlined stress-testing processes:** Create a highly automated process to improve operational efficiencies and increase transparency.
- **Reduced maintenance costs and complexity:** Use a common platform across a range of risk and finance functions (for example, IFRS 9) and significantly reduce the required code base.
- **Reduced operational risks and tighten controls:** Embed a strong control structure to ensure the robustness required by management, auditors and regulators.
- **The ability to use existing models:** Jump-start the stress-testing process using prebuilt templates for stressed ECL and RWA or implement additional models (developed with SAS or another language) using internal or external data sources.
- **Significantly shorter cycle times:** Produce results faster and become more responsive and influential to business decision making. Deepen analysis over a wider range of scenarios in less time.
- **Alignment of stress tests with internal capital planning:** Ensure consistency and alignment across internal planning, budgeting and forecasting exercises.
- **Greater collaboration:** Facilitate process harmonization and information sharing across your organization.

And because you can adapt the solution to support other key activities such as IFRS 9 and CECL tasks, you can reduce overall IT costs, as well as minimize implementation and maintenance time and effort.

## How SAS® Can Help

The SAS enterprise stress-testing solution lets you customize processes and quickly adapt them to meet evolving stress-testing requirements. The result is optimal support for all internal and regulatory stress testing that includes:

- **Powerful data management:** Ensure accuracy, completeness and consistency through a flexible and user-friendly rules engine. Manage segmentation and aggregation with full transparency.
- **Customizable workflows:** Streamline and automate tasks to eliminate bottlenecks and reduce resource dependencies. Embed controls and approvals to ensure consistency and good governance.
- **Centralized orchestration:** Easily monitor progress against plan and quickly address issues as they occur.

- **Scenario management tools:** Create, modify and apply scenarios to selected portfolios and overlay granular portfolio growth assumptions.
- **A model implementation platform:** Implement, manage and quickly execute the required models. Apply user-defined logic to establish interconnections between models to reduce interventions.
- **Dynamic reporting and visualizations:** Automate standardized reports to reduce cycle time and operational risks. Quickly view summarized data and drill into granular detail with point-and-click capabilities.

## Key Capabilities

The SAS solution for enterprise stress testing addresses the entire stress-test production cycle. Key capabilities include:

- Full process orchestration through a web-based dashboard.
- Efficient and transparent data management.
- Highly automated workflows with embedded controls.
- Powerful scenario management tools.
- Centralized model management supporting both in-house and third-party models.
- High-performance computations through a scalable in-memory risk engine.
- Flexible and fully auditable segmentation and aggregation capabilities.
- On-the-fly visualizations and standardized reporting.
- Fully customizable attribution analysis.

### Ensure data quality is maintained throughout the process

Enterprise stress testing requires a myriad of granular data, and the credibility of your results depends on its integrity. The SAS enterprise stress-testing solution provides tools for the entire data lineage, including a customizable rules manager for validation, treatments and pooling. You can also incorporate overlays and qualitative adjustments across different dimensions while maintaining a full audit trail throughout the process.

### Incorporate strong analytical capabilities

The projection of portfolios over multiple scenarios requires complex, granular analytics. You may need to use different modeling techniques, while maintaining logically consistent assumptions, across asset classes. SAS allows you to develop and implement models and easily incorporate interdependencies and hierarchies between them. Powerful model implementation capabilities significantly reduce coding requirements, making the stress-test process easier to implement and maintain. And thanks to the software's user-friendly interface, a broad range of staff can execute models and analyze results.

## Challenges

- **Tight timelines.** Stress tests demand fast turnaround, and institutions struggle to ensure robust delivery with existing resource-intensive processes.
- **Limited resources.** Competition for analytical talent is tough, and institutions fight to acquire and maintain the skills needed for sustainability and reduce key person risks.
- **Siloed systems and processes.** Institutions struggle to construct enterprise-level views from discretely modeled stages that are often run independently along product or organizational lines.
- **Technology limitations.** Current systems are strained by the complex, granular computations required for scenario-based analysis. Long cycle times constrain the number of scenarios that can be considered.
- **Competing demands.** Institutions must balance their time and resources to address both regulatory expectations around stress testing and implementation of new accounting standards (e.g., IFRS 9, IFRS 17, CECL).

### Support flexible portfolio segmentation

Whether you are performing regulatory stress testing or internal scenario analyses, you'll need the ability to run different tests and analyses on your portfolio in multiple ways. That's why our enterprise stress-testing solution includes a segmentation feature that allows you to define specific portfolio segmentations based on user-defined variables. Each of these segmentation schemes can be applied to different calculations to obtain results that are tailored to a given analysis or stakeholder's requirements.

### Establish a controlled orchestration

Because enterprise stress tests typically rely on the contributions of many people from across your institution, managing the entire process can be difficult. To simplify the process, the SAS enterprise stress-testing solution streamlines everything from data alignment and mapping to coordination of tasks and approvals. At the same time, it allows you to centrally orchestrate the process with confidence and defend results against management challenges, regulatory reviews and audits.

## Differentiators

Only SAS offers a comprehensive solution for all types of stress testing, as well as:

- **An adaptive architecture:** SAS solutions are scaled to your institution and are adaptable to changing business needs and market requirements.
- **Purpose-built content:** SAS solutions are continuously updated to provide industry-leading capabilities and ensure ongoing best practices.
- **Constructive collaboration:** No black box here. With centers of excellence around the world, staffed with subject matter experts, you are ensured our support throughout the analytics journey.
- **Industry-leading analytics:** For over four decades, SAS has been the undisputed leader in business analytics, enabling

organizations all over the world to obtain the best results, discover new insights and make confident, fact-based decisions – no matter how big the data nor how complex the analysis.

## The SAS® Portfolio of Enterprise Stress-Testing Solutions

The SAS enterprise stress-testing solution brings together three powerful SAS applications:

- **SAS Risk Stratum.** A centralized, flexible, high-performance risk and finance analytics environment.
  - o Provides a single platform and modular structure for managing workflows, capturing data, executing models, and consolidating and reporting results.
  - o Scales to support multiple risk initiatives, such as enterprise stress testing, IFRS 9 and CECL.
- **SAS Solution for Stress Testing.** An add-on component to SAS Risk Stratum, regularly updated to provide industry-leading capabilities.
  - o Accelerates the implementation and maintenance of a best-in-class enterprise stress-testing program.
  - o Includes powerful, purpose-built components for data quality assurance, process orchestration, scenario management and reporting.
- **SAS Model Risk Management.** A complementary solution that provides organizations a fully integrated model governance framework.
  - o Inventories entire model library, complete with documentation, validation detail and interdependencies.
  - o Identifies and reports model risk from the individual model level to the aggregate enterprise level.

To contact your local SAS office, please visit: [sas.com/offices](https://sas.com/offices)

