SAS® High-Performance Risk

A fast, on-demand risk calculation engine for accurate risk decision management and aggregated risk reporting

What does SAS® High-Performance Risk do?

SAS High-Performance Risk calculates firmwide risk exposure with speed and precision across all risk types – market, credit and liquidity – on an intraday or near-real-time basis. Our powerful risk engine technology processes risk calculations and aggregates results over an in-memory grid. Because the software can store large volumes of results and perform complex calculations very quickly, you can investigate risk information in near-real time using on-demand hierarchies.

Why is SAS® High-Performance Risk important?

Obtaining consolidated risk results across asset classes, portfolios and lines of business can be daunting for most large financial institutions and trading desks. SAS High-Performance Risk strengthens an organization's ability to make strategic decisions, improve efficiency and reduce the probability of losses. It also helps boost profitability by enabling risk managers to analyze and report risk exposures in an on-demand environment.

For whom is SAS® High-Performance Risk designed?

SAS High-Performance Risk is designed primarily for chief risk officers (CROs) and risk analysts in banks, investment banks, and capital markets.

How quickly can you assess your risk exposures? Fast enough – and with enough accuracy – to respond to market fluctuations? What about in times of financial crisis? If you're unable to respond quickly and precisely, you will be unable to make timely decisions to unwind and/or hedge your holdings. And the fallout can prove disastrous.

These days, already-huge data volumes are continuing to grow. Problems are increasing in complexity. Performance expectations are rising. Decision-making windows are shrinking. And regulatory requirements are ever-growing and ever-changing. In spite of all this – or perhaps because of it – there has never been a greater need for the timely assessment of firmwide exposure across all risk types.

SAS High-Performance Risk merges the power of an integrated risk engine with a high-performance analytics infrastructure to enable fast, accurate risk exposure assessments and swift, well-informed decisions that can safeguard and enhance your firm's overall financial position.

The solution gives you fast, accurate answers to questions about current and potential P&Ls, cash flows and risk exposures. This enables you to make prompt, well-informed portfolio decisions – even in highly volatile and stressed environments. In addition, you get:

- The ability to reduce regulatory compliance costs.
- Faster computation speed, by several orders of magnitude, for producing key risk results within the time frames that critical decisions demand.
- Considerably greater precision in complex portfolio valuations, liquidity analysis and cash flow projections.
- Up-to-date portfolio views of aggregated risk by accommodating near-real-time data feeds for data relating to portions of the portfolio.
- On-demand, interactive reporting using in-memory technology to reduce I/O burdens.
- The right level of detail for any user – from executives needing high-level summary views, to analysts needing to drill into the most granular details in response to inquiries from many regulatory agencies with little notice.

Key Benefits

Get fast, accurate portfolio risk and exposure measures. Quickly conduct complex risk analyses of very large portfolios. Patent-pending techniques deliver significant performance gains, so you can:

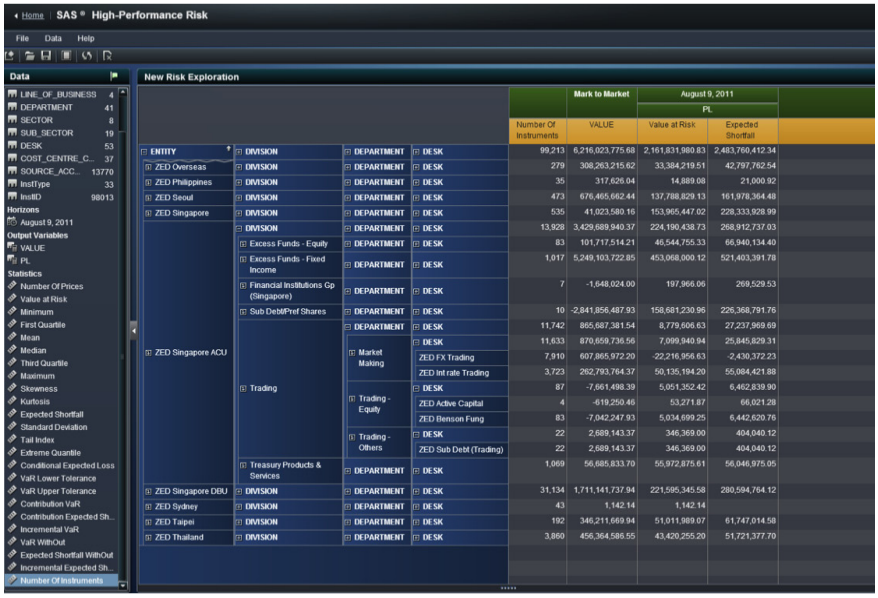
- Calculate risk measures from a variety of models that deal with millions of marketable securities, market indices, and financial assets and obligations.
- Complete risk aggregations and calculate market risk, liquidity risk, credit risk, exposure and CVA in near-real time (intraday).

React to market events with greater speed and precision. Price and manage complex, intraday incremental exposures based on the full distribution of market states. Promptly recognize and address economic shocks in order to take advantage of better arbitrage opportunities.

Quickly identify optimal actions and make the best informed decisions. Conduct rapid, on-demand scenario analyses to uncover optimized solutions to liquidity and capital needs at the speed of the market. In addition, you can:

- Produce what-if scenarios based on the most complex portfolios, positions and instruments across multiple time horizons.
- Change parameters and rerun scenarios on demand to examine outcomes relative to potential capital gains/losses, changes in yield or cost of funds.

Plan ahead and formulate contingencies. Use in-memory technology to simultaneously deal with millions of correlated positions, overlapping constraints and hundreds of thousands of market states relative to market shocks, asset or currency depreciation, funding shortages, domino effects, etc.



Perform risk analyses and explore risk results quickly and easily.

Product Overview

SAS High-Performance Risk features a powerful, flexible risk engine in an open environment that lets users configure new instruments, develop new pricing functions, add new risk factors and create new scenarios as needed. In-memory grid computing increases responsiveness and concurrency to dramatically reduce run times. Risk analysis results are held in memory, enabling instantaneous stress testing, scenario analysis and interrogation of results on multiple portfolios.

Flexible Risk Analysis Capabilities

Perform smarter analyses faster using the most advanced analytics available. With the solution, you can:

- Build new, custom risk analysis projects, and interact with analysis results based on user-defined outputs.
- Analyze and measure risk using a range of techniques – simulation, sensitivity analysis, profit/loss analysis, cash flows, liquidity, etc.
- Quickly aggregate results and calculate risk measures on demand at designated hierarchies post-aggregation.
- Perform interactive scenario analyses, mark-to-market valuation and stress testing on demand, along with multiple types of simulation – covariance, Monte Carlo, etc.

Interactive Stress Testing

All levels of users – from quantitative analysts to business users – can create and run complex shock and recovery scenarios interactively via a user-friendly interface. With the solution, you can:

- Create ad hoc scenarios, define subportfolios and compare scenario results. Interactively change parameters and rerun scenarios to analyze the effects of extreme changes in risk factor values.
- Aggregate across the banking and trading books, trading desks, and lines of business in a single environment that accelerates stress testing and allows the application of a common set of scenarios and factors.
- Integrate most of the firm's existing stress-testing models, which eliminates the need to rewrite them.

Open Pricing Model Library

SAS High-Performance Risk supports user-defined pricing functions. In addition, third-party libraries (e.g., FINCAD) may be used, enabling you to easily program, test and implement any pricing model.

Flexible Web-Based Interface

A user-friendly interface lets risk analysts and executives explore risk information on demand by choosing dimensions, hierarchies and variables on the fly, versus traditional cubes that must be defined in advance. You can:

- Develop new risk aggregation or stress testing queries.
- Explore risk analysis output in a richer context for a better understanding of overall risk position and capital adequacy.

- Store most granular results in memory to support on-demand hierarchical queries, which may specify certain portfolio dimensions (e.g., asset class, trading desk, line of business) and levels of data (e.g., trade level, trader, security owner and execution window).
- Drill into risk portfolios to aggregate risk exposures, asset positions and calculate risk measures down to any level of detail, and customize the view.

Event Stream Processing Integration

Capital markets firms with trading operations need fast risk analytics that can analyze pre-trade risks, dynamically value portfolios and continuously monitor limits. This requires a risk engine that you can connect with high-speed, low-latency streams of market, reference and pricing data.

The SAS High-Performance Risk engine includes an interface to the SAS Event-Stream Processing Engine, an event processing solution that can feed high-speed data sources – including market and reference data feeds – to the risk engine for analysis.

SAS® High-Performance Risk System Requirements

To learn more about SAS High-Performance Risk, download white papers, view screenshots and see other related material, please visit sas.com/hprisk.

For information on configurations and system requirements, please contact your local SAS sales representative.

Key Features

A Scalable, In-Memory Risk Engine

- Transparent risk environment configuration.
- Flexible pricing library definition and integration.
- Rich risk analysis capability.
- Fast valuation and risk aggregation.
- Ability to work with big data.
- Rich reporting tools.
- Integration with event stream processing, high-performance analytics and visual analytics.

Flexible Risk Analysis Capabilities

Provides the ability to perform:

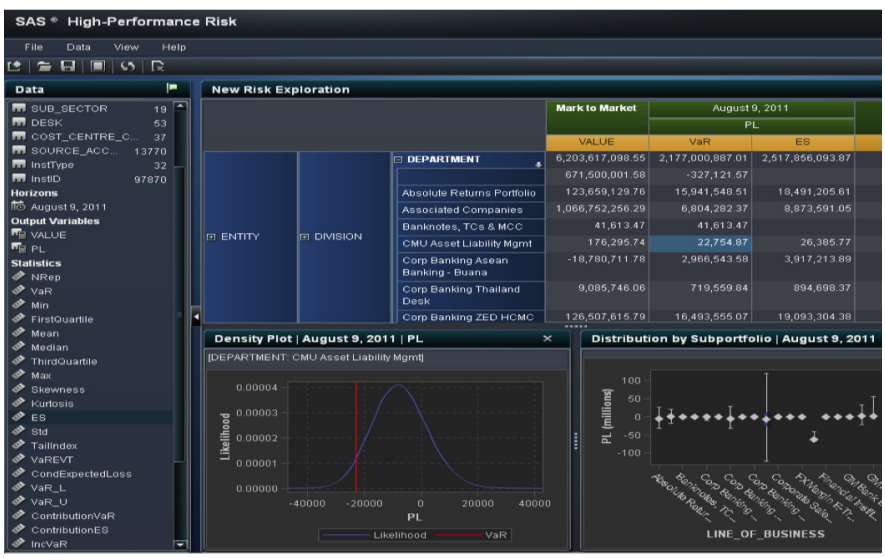
- On-demand regulatory risk analysis.
- Profit and loss analysis based on market, credit and liquidity risk.
- Sensitivity analysis.
- Fast, interactive stress testing and scenario analysis.
- Advanced simulation-based risk analysis.
- Counterparty risk and collateral risk analysis.
- Cash flow analysis.
- Incremental risk and risk contribution analysis.

Open Pricing Model Library

- User-definable open pricing code.
- Compatibility with third-party or internal pricing libraries.
- Broad instrument coverage – loans, mortgages, repos, equities, FX, fixed income, derivatives, structured products.

Web-Based Interface

- Flexible, on-demand reporting hierarchy definition.
- Real-time aggregation responding to user-defined drill path.
- Risk exploration template on the viewing preference.
- Multivariable, statistics and horizon view.
- Interactive, ad hoc scenario and stress test builder.



Run queries on demand.

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