FIS Balance Sheet Manager – Credit Value at Risk module

Unlock improved credit risk evaluation and management

The Credit Risk Value at Risk (Credit VaR) module of FIS® Balance Sheet Manager is a sophisticated tool designed to help evaluate and manage credit risk by calculating the unexpected loss of a credit portfolio. This calculation is crucial as it enables users to estimate the required capital to safeguard against potential risks (that is, its economic capital) and is a fundamental step of the ICAAP prescribed by Basel regulation.

The methodology used is based on the Merton-Model, comparable to the CreditMetrics™ model, which simulates changes in creditworthiness using Monte Carlo Simulation. Correlations between exposures are modelled using systematic and idiosyncratic factors, while the realisations of the former copulas are applied.

The methodologies of classical credit portfolio models have been significantly expanded to cover the entire spectrum of the trading and banking book. This includes traded and corporate exposures as well as large and diverse retail portfolios. By extending these methodologies, the system can comprehensively evaluate and manage credit risk across all types of financial instruments and customer segments, for a more robust and inclusive risk management framework.

Output and reporting

The Credit VaR module provides a comprehensive output that includes the full loss distribution and key risk measures such as Value at Risk (VaR), Expected Loss, Standard Deviation and Expected Shortfall (ES). It also offers advanced reporting and analytical capabilities tailored for economic insight.

Users can perform dynamic "slice-and-dice" operations across sub-portfolios for targeted analysis of credit risk exposures by segment, geography, rating class or other dimensions. The flexible reporting engine supports filtering, grouping and comparative views, allowing institutions to isolate and assess risk concentrations, migration trends and capital drivers.

The module also supports deep driver analysis and quantification of diversification effects, both within and across sub-portfolios, providing a clearer understanding of how risk components interact and offset each other. Thanks to the abundance of intermediate simulation results, users can conduct in-depth investigations into the sources of portfolio volatility and capital consumption.

Drilldown functionality enables users to trace aggregated results back to individual exposures, facilitating granular attribution of risk and capital.

"As we navigate through the storms brewing over today's increasingly complex risk landscape, stable banks are more important than ever."

Frank Elderson, ECB Vice-Chair of Supervisory Board, March 19, 2025, "Resilience offers a competitive advantage, especially in uncertain times." Keynote speech at the Morgan Stanley European Financials Conference, London

Risk types

Besides covering default risk by calculating the potential loss related to a default for each exposure in the portfolio over the defined risk horizon, which is typically covered by classical Credit VaR models, Balance Sheet Manager's Credit VaR module covers additional key risk types to provide a comprehensive assessment of credit risk.

Migration risk

Migration risk involves the risk of loss due to changes in the credit quality of an exposure, even if there is no default. This includes both migration gains and losses, reflecting the impact of credit rating upgrades or downgrades. The Credit VaR module assesses the changes in the value of an exposure due to credit rating migrations by leveraging the integrated ALM (for corporate and traded products) as well as ECL (for retail portfolio) engines included in Balance Sheet Manager. Both prospective as well as retrospective migration gains and losses can be taken into account in the Monte Carlo Simulation.

Concentration risk

Concentration risk arises when the creditworthiness of multiple exposures within the portfolio is highly correlated, leading to simultaneous changes in their credit quality. This risk type is significant because high correlation among portfolio members increases portfolio variance. The Credit VaR module models correlations between positions using both systematic and idiosyncratic factors to manage concentration risk effectively.

Stochastic Loss Given Default (LGD) risk

Balance Sheet Manager has extensive collateral modelling functionalities as well as flexible credit risk mitigation (CRM) allocation algorithms to calculate a weighted average LGD. However, as LGD is typically volatile and difficult to estimate in advance due to factors such as potential recovery and uncertainties surrounding insolvency proceedings, the Credit VaR module supports stochastic LGD modelling to account for the variability in losses in case of default. For this purpose, a beta distribution is applied, providing a more realistic representation of potential losses.

Settlement risk

Settlement risk is the risk that a counterparty will fail to deliver their end of a transaction after the bank has already delivered its part. This risk is most relevant for derivative transactions where the exchange of cash flows does not happen simultaneously. The Credit VaR module considers settlement risk by calculating the potential loss if a counterparty defaults during the settlement period.

Performance and memory optimization

To enhance efficiency and boost performance while preserving full accuracy in the Credit VaR calculation even under highly demanding simulation workloads, the Credit VaR module provides sophisticated pooling and memory optimisation algorithms.

Pooling is a special type of aggregation performed for performance reasons. It aims to reduce the number of positions in the portfolio while preserving their risk characteristics, thereby shortening computation times. The goal is to group exposures with similar risk profiles into suitable and efficiently simulated pools. By making minor modifications to the risk parameters of exposures within a pool, the group of comparable but not identical exposures becomes a homogeneous group. Instead of deriving default behavior from multiple independent random variables, it draws from a single binomially distributed random variable for homogenized exposures to obtain the number of defaults. In the extreme case of a very granular, homogeneous portfolio (Large Homogeneous Portfolio), default drawing can be entirely omitted.

During evaluation run-time, under a traditional approach, large portfolios combined with a large number of simulations could easily run out of memory, as well as storage space. To solve this problem, Balance Sheet Manager defines threshold boundaries in the loss distribution and only keeps detailed results for scenarios that fall into the critical range (the tail of the distribution relevant for risk metrics).

As the simulation runs, these boundaries are dynamically recalibrated based on interim results. When a recalibration occurs, any scenario outcomes outside the updated boundaries have their fine-grained data binned or discarded, immediately freeing up memory. This way, the simulation progressively narrows focus on the most extreme outcomes, and memory consumption stays low without losing accuracy in the Credit VaR calculation. By the end, only the necessary tail scenario data is retained, yielding a massive memory reduction while still accurately capturing the portfolio's risk profile.

Aggregation and capital allocation

Balance Sheet Manager supports flexible Credit VaR aggregation mechanisms, which allows for the grouping of multiple positions or legs of a single position into aggregated positions before the Monte Carlo Simulation. This ensures that these positions are treated as one within the simulation, maintaining their economic relationships. For example, multiple exposures of a single customer are commonly assumed to move together or banks might be interested in modelling default clusters to analyse and stress their concentration risk.

By utilizing advanced mechanisms for distributing the overall required capital, the calculated portfolio risk measures are allocated down to the individual position level according to its tail contribution, enabling precise and effective capital management.

Stress testing, capital planning, regulatory compliance and strategic decision making

The Credit VaR module plays a pivotal role in enabling institutions to conduct comprehensive stress testing and capital planning. Fully integrated with other key modules such as ALM for Net Interest Income (NII), ECL for provisions, P&L for other income, Market Risk, Operational Risk, and other risk types, the Credit VaR module ensures a unified and consistent approach to the Internal Capital Adequacy Assessment Process (ICAAP).

This integration allows institutions to leverage any Balance Sheet Manager functionalities, including behavioural and new business modelling as well as extensive scenario and stress testing capabilities. The module enables flexible modelling and stress testing of all key risk parameters – EAD, PD, LGD, ratings, rating migration matrices, factor correlations and factor sensitivities – ensuring robust scenario analysis.

Additionally, the Credit VaR module provides advanced analytical tools to assess diversification effects, identify key risk drivers and support strategic decisions on capital allocation and risk mitigation. This holistic approach not only strengthens regulatory compliance but also enhances financial resilience and decision-making agility.

Key benefits

Comprehensive risk evaluation

Calculates unexpected losses and captures correlations between exposures using advanced methodologies

Detailed risk measures

Provides full loss distribution and key risk measures like VaR, Expected Loss, Standard Deviation and Expected Shortfall

Expanded coverage

Evaluates and manages credit risk across trading, banking books and diverse retail portfolios

Broad risk type coverage

Includes default, migration, concentration, stochastic LGD and settlement risks

Aggregation and pooling

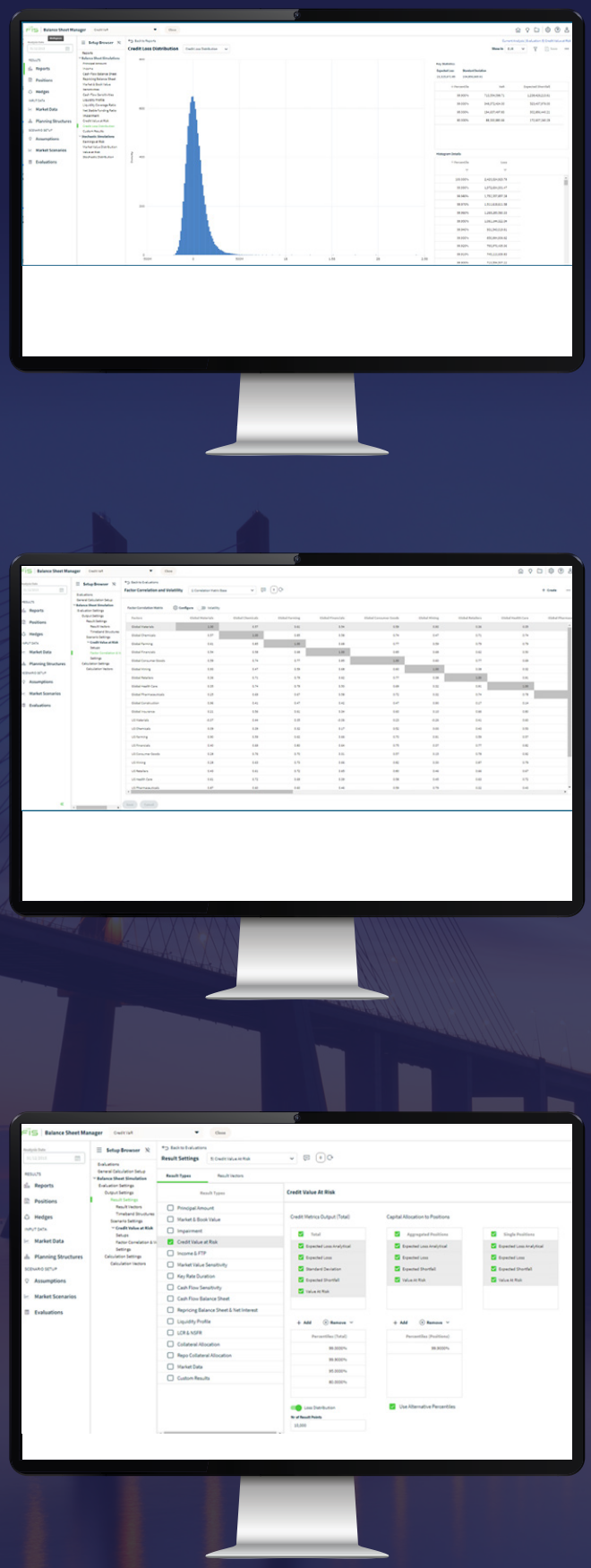
Enhances efficiency by grouping positions and pooling similar risk profiles, enabling precise capital management

Stress testing and scenario analysis

Simulates severe conditions to ensure sufficient capital and inform strategic decisions

Capital planning and regulatory compliance

Supports strategic decision-making and helps meet regulatory capital adequacy requirements as well as to decrease capital costs.



A leader in risk management

FIS is a member of the Fortune 500® and the Standard & Poor's 500® Index and receives consistent industry recognition. We were most recently awarded Category Leader across the Chartis ALM Solutions, 2024 report.

Learn more

For more information on FIS Balance Sheet Manager - Credit Value at Risk, contact your account manager or visit **FISGlobal.com/contact us**.

Money at rest Money in motion Money at work™

FIS Balance Sheet Manager allows you to manage material risks to drive sustainable growth.

Our technology powers the global economy across the money lifecycle.

Money at rest

Unlock seamless integration and human-centric digital experiences while ensuring efficiency, stability, and compliance as your business grows.

Money in motion

Unlock liquidity and flow of funds by synchronizing transactions, payment systems, and financial networks without compromising speed or security.

Money at work

Unlock a cohesive financial ecosystem and insights for strategic decisions to expand operations while optimizing performance.

About FIS

FIS is a financial technology company providing solutions to financial institutions, businesses and developers. We unlock financial technology that underpins the world's financial system. Our people are dedicated to advancing the way the world pays, banks and invests, by helping our clients confidently run, grow and protect their businesses. Our expertise comes from decades of experience helping financial institutions and businesses adapt to meet the needs of their customers by harnessing the power that comes when reliability meets innovation in financial technology. Headquartered in Jacksonville, Florida, FIS is a member of the Fortune 500® and the Standard & Poor's 500® Index. To learn more, visit FISglobal.com. Follow FIS on LinkedIn, Facebook and X (@FISglobal).

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