

KONDOR GLOBAL RISK PFE & CREDIT VAR

POTENTIAL FUTURE EXPOSURE (PFE)

Assessing the credit risk of market-sensitive instruments requires sophisticated tools. Effectively calculating the Potential Future Exposure (PFE) requires more than just traditional analytic methods since it needs to capture the correlation between market variables and portfolio effects over time.

Kondor Global Risk (KGR) has a module that uses Monte Carlo simulation to calculate PFE. This involves simulating future paths of market variables, aging the portfolio through time with simulated payments and deal events, and computing exposure values at each simulation point – whilst taking into account credit risk mitigation techniques. Monte Carlo methodology is especially important for portfolios which include options and other nonlinear instruments.

Our PFE engine provides Monte Carlo simulated market rates for risk factors such as FX rates, asset prices, IR curves (zero rates) spreads & volatility surfaces. The process simulates risk factor values at user-selected fixed or floating future time nodes for the maturity profile of the portfolio for each Monte Carlo path (the number of paths is selected by the user). PFE is then measured as a quantile of portfolio prices distribution, for a given user-defined confidence level (e.g. 99%).

KGR PFE features

The **Counterparty Exposure Report** displays exposure for a given counterparty vs. time for a given quantile (PFE profile) in gross and net terms (incorporating the mitigation of risk from netting and/or collateral agreements).

The **Simulation Approach** in the KGR PFE engine provides:

- Scenario-generation model based on a cross-asset implementation using the Hull and White one- factor framework
- Correlations are specified directly or calculated from historical time series
- User-defined future time nodes where deals are re-evaluated
- Each deal priced and aged separately along market-rate scenario paths
- Deal aging module updates deal data as it evolves (this is especially important for path-dependent options)
- Engine simulates rate fixings, cash flow amounts for floating rates, and option exercise decisions
- Aggregation module combines 'per leg' results with netting and collateral and computes PFE statistics

Additional **Benefits** of our PFE engine include:

- More accurate calculation of potential future exposures on a portfolio and deal basis
- More precise exposure values which can be compared against regulatory exposures (e.g. mark-to-market plus add-on)
- Captures changes of exposure over time
- Avoids the need to batch-import market values from a front-office system
- Analyzes sources of exposure with drilldown features to evaluate the effect of deal aging, collateral, and netting
- Limits in PFE can be configured and computed by KGR



CREDIT VAR

Quantitative portfolio approach to credit risk management has gained importance among bankers and other portfolio managers since the mid-1990s. Concentration risk can only be mitigated by diversification. Also fixed exposure limits are limited and a more quantitative portfolio approach would make credit lines a function of marginal portfolio volatility. Portfolio effects provide the foundation for rational risk-based capital allocation. Such a model is equally appropriate for economic capital purposes.

CreditVaR with CreditMetrics as the portfolio model is a benchmark in this area. It measures the potential credit risk of a counterparty or portfolio suffering a default or a change in credit quality. This measure allows for an accurate and dynamic calculation of credit reserve requirements, and a systematic diversification of credit risk.

KGR CREDIT VAR FEATURES

The Credit VaR module is based on advanced Monte Carlo simulation and extends the credit risk functions of Kondor Global Risk (KGR) to economic capital.

For Basel II, it anticipates the use of internal models for credit risk and ensures a coherent measure of credit risk which can then be used for limits management by consolidating exposures.

Two types of credit events (counterparty default, and upgrades/downgrades of counterparty ratings) predict the maximum possible loss of a portfolio due to credit migrations at a given confidence level over a given period of time.

- A Black-Scholes-Merton default model predicts default status only, uses asset returns to estimate default and prices portfolio value at default only, applying recovery rates
- A CreditMetrics methodology-based model – which can be seen as an extension of the Black-Scholes-Merton model that predicts rating transitions – uses asset returns to estimate rating changes and price portfolio values for all rating grades, applying credit spreads

The exposure calculation is based on the PFE module of KGR. In the event of default, the recovery value is simulated based on estimated LGD value at the deal level.

After aggregating simulated P&L, which is the loss due to default or rating downgrade, taking into account netting, collateral and guarantees, and computing Credit VaR statistics, several reports could be displayed.

At the report level, the VaR results are shown with and without credit risk mitigation impacts per aggregation terms and totals. Details can be included and sorting criteria can be chosen to display Credit VaR by position or counterparty. Credit VaR Limits are also available on the pre-deal check and reporting levels.

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