

# Quaternion™ approach to Backtesting Model Validation

The Basel Committee stated that banks using Internal Model Method (IMM banks) to calculate regulatory capital are required to carry out on-going validation of their counterparty credit risk (CCR) exposure models. For these IMM banks, ensuring the accuracy of CCR models – the risk that a counterparty to an OTC transaction will fail to meet its obligations and the resulting losses – is essential. The key ingredients in CCR modelling are Loss Given Default (LGD), Probability of Default (PD) and Exposure At Default (EAD).

For derivatives portfolios, EAD is the hardest to establish, because unlike for loans and bonds, it is not just determined by a notional amount. An IMM bank will compute EAD using the output of a Monte Carlo simulation of future exposure. However, international regulators require IMM models to pass backtesting at the **Risk Factor Evolution (RFE)**, portfolio and correlation level. Backtesting is the assessment of the predictive power of that model by comparing its past predictions with realized outcomes.

Backtesting CCR models can be anything but simple. It has become increasingly important in the financial industry – since both the CCR capital charge and CVA management have become a core activity for most global banks. Furthermore, failure to pass backtesting leads to capital penalties. However, there are no clear guidelines by regulators as to how to perform this backtesting, in contrast to Market Risk models, and this is where Quaternion can support clients. Quaternion has devised a proven quantitative methodology to backtest model predictions based on four different statistical tests.

Quaternion has developed a software module – an extension of ORE – for a number of leading global financial institutions, which ensures IMM banks can meet their backtesting requirements while increasing the accuracy and robustness of their IMM model frameworks. Without the need to build a trade data interface, this module can be employed, with very limited effort, to perform backtesting on the RFE by generating market scenarios. Additionally, by integrating the exposure calculation engine, the full spectrum of backtesting tasks can be covered.



## CLIENT MODEL

A client's internal model has been developed by the risk or technical units based on the existing frameworks of the organisation itself



## ORE

Open Source Risk provides an Open Source engine under an open BSD license providing a fully transparent, cutting edge platform for the Quaternion product suite



## ORE+

Quaternion has developed a series of libraries integrating with Open Source Risk to deliver superior results in terms of speed and breadth

## Features

- Coverage of all asset classes
- Large coverage of derivatives products
- Speed and accuracy
- Open Source Quantlib libraries an integral part

## Benefits

- Transparency of the core model
- Independent model validation
- Regulatory compliance
- Extending Open Source Risk
- Developed by Quaternion experts