ORACLE FINANCIAL SERVICES MARKET RISK

Global financial services institutions need to accurately assess the relationship between existing capital and level of risk, enabling them to effectively develop their business strategy while offering operational value to their stakeholders. Oracle Financial Services Market Risk provides extensive and robust computations that enable institutions to effectively evaluate and manage risk across interest rate, commodity, equity & currency exposures through calculation of measures such as Value-at-Risk (VaR), Conditional Value-at-Risk (CVaR) and Component Value-at-Risk and covers a wide range of instruments types including exotic derivatives.

Assess risk at any level of granularity
Oracle Financial Services Market Risk enables institutions to estimate the risk for multiple, user-defined portfolios. Portfolios are defined based on a combination of one or more dimensions such as counterparty, line of business, legal entity, asset class and instrument type that enable risk assessment at any required level of granularity in the organization. This provides institutions with a holistic view of market risk on their trading book. It also enables them to regulate risk at the level of each dimension and thereby develop effective risk management strategies.

Estimate portfolio risk across multiple models
Oracle Financial Services Market Risk offers the flexibility of estimating the risk of the portfolios based on user specified parameters such as time horizon, decay factor, confidence level and supports seasonality adjustments, which are critical in case of commodity exposures. The parameterization process is driven by a business user-friendly GUI and is configured in a manner that allows for estimation of risk of a portfolio across multiple models.

Comply with regulatory requirements
Instrument valuation and risk measure estimation is based on industry standard methodologies and statistical techniques. Oracle Financial Services Market Risk provides for analytic, historical simulation and Monte Carlo simulation methods for estimation of risk measures. These methodologies are compliant with the Internal Models Approach of capital calculation for Market Risk under Pillar I of the Basel Accord.

Robust risk calculations

Variance-Covariance Estimation: Oracle Financial Services Market Risk supports two standard methodologies, Exponentially Weighted Moving Averages (EWMA) method and Generalized AutoRegressive Conditional Heteroskedasticity (GARCH) method, for estimating the Variance – Covariance Matrix of risk factors. Seasonal adjustments are factored in while estimating variance and covariance for risk factors, such as commodities, which exhibit seasonal behavior in the price movements.

Cash Flow Mapping: Cash flows of instruments are calculated and allocated to a set of standard vertices in a manner such that the present value and risk is preserved. The cash flows from each instrument are reported at the individual vertex level as well as at the instrument
Instrument Pricing: Oracle Financial Services Market Risk has integrated pricing routines that enable valuation of a wide range of instruments, including exotic derivatives such as caps, quants and basket structures. Instruments are priced based on their underlying risk factor. The pricing functions enable the assessment of the sensitivity of option instruments to multiple parameters by estimating the Greeks, such as Delta, Gamma, and Rho.

Risk Factor Modeling & Simulation: Underlying risk factors for each instrument are modeled using stochastic processes such as Black, Ho-Lee & Hull-White, and Garman-Kohlhagen. The parameters of each of these processes are estimated using standard statistical techniques that are based on generalized linear models are used for calibration of the parameters of each of these processes.

Risk Measure Estimation: Oracle Financial Services Market Risk enables institutions to estimate the risk measures such as VaR, CVaR, Undiversified VaR and Component VaR for multiple portfolios of market traded instruments based on user specified parameters. The profit and loss distribution is estimated under the simulation methods. Sensitivity of option instruments to the underlying parameters, such as price of the underlying, volatility, time to maturity, or interest rates is estimated. The application calculates and ranks the Component VaR of each vertex or instrument position by its contribution to the portfolio risk. This allows institutions to identify risk concentrations within a portfolio and thereby assists in strategic decision making.

Validate market risk estimates

Oracle Financial Services Market Risk enables validation of an institution’s market risk models by comparing the P&L with the estimated VaR values and calculating back testing measures based on user defined look back period. In addition to reporting the number of exceptions, the application utilizes a Kupiec Test which verifies whether the frequency of exceptions is greater than the frequency of expected exceptions as determined by the VaR model. Other back test measures computed as part of validation of market risk model include loss exception deviation, average loss duration and loss duration deviation.
Figure 2: Hypothetical P&L v/s VaR Estimates

Estimate risk under extreme scenarios

Stress testing supplements VaR estimates and provides the bank with a robust estimate of market risk. Oracle Financial Services Market Risk enables banks to define scenarios and assess the impact of such scenarios on the profit or loss of the portfolio. These scenarios may be based on historical events such as Gulf War, Black Monday or may be defined based on user judgment. Scenarios comprise of shocks to risk factors, specified as absolute values, percentages or standard deviation or log standard deviation shifts in the values. It also allows curve shocks in the case of term structure risk factors based on shock models such as parallel shifts, twists and curvature.

The application estimates stressed loss of a portfolio under each scenario mapped to it. It also provides insight into the scenario which would result in maximum portfolio loss by enabling comparison of stressed loss across multiple scenarios mapped to the portfolio. Additionally it allows for a detailed analysis of the P&L distribution under each stress scenario.

Figure 3: Portfolio Loss across Stress Scenarios

Comply with multi-jurisdictional reporting mandates

Oracle Financial Services Market Risk offers the flexibility of defining multiple Market Risk VaR Models, each catering to the requirements of a different regulator. A single portfolio is allowed to be mapped to multiple models and the VaR measures can be estimated under multiple sets of parameters thereby enabling multi-jurisdictional reporting of the regulatory capital as well as reporting for internal monitoring and management of market risk.

Advanced Market Risk Analytics

Oracle Financial Services Market Risk has strong dashboard capability which enables the delivery of advanced market analytics through reports, charts and graphs having drill-through capability. The risk metrics reported include VaR, CVaR, portfolio value, Greeks, loss under
The following solutions are also available from Oracle Financial Services:

- Oracle Financial Services Economic Capital
- Oracle Financial Services Retail Credit Risk
- Oracle Financial Services Corporate Credit Risk
- Oracle Financial Services Operational Risk Economic Capital
- Oracle Financial Services Operational Risk
- Oracle Financial Services Basel Regulatory Capital
- Oracle Financial Services Asset Liability Management

Stress scenarios and, number of exceptions. Alerts are also displayed based on pre-specified rules. The VaR metrics are reported at portfolio level as well as at individual dimension, vertex and position levels. Cash flows are reported at the individual vertex level as well as at the instrument position level, while the stressed loss and back test measures are reported at the portfolio level. Stressed loss of a portfolio is displayed under multiple stress scenarios. The reports and metrics are presented in a manner such that the information can be easily understood by the business user.

The dashboard allows the comparison of risk and back testing measures across multiple portfolios and market risk models. This allows the top management to compare the relative risk and performance of each portfolio and devise appropriate strategies.

Analyze market trends

The market trends characterized by the movements in the values of key risk factors are captured and reported on a daily basis. These market movements can then be analyzed by institutions to understand the trends in the markets that they are operating in.

Figure 4: Market Analysis

**Oracle Analytic Applications for Enterprise Risk Management**

Oracle Financial Services Enterprise Risk Management suite enables financial institutions to establish a single measure of risk across the organization, thereby optimizing capital requirements.

The Oracle Financial Services Enterprise Risk Management suite includes best-of-breed applications for Credit Risk, Treasury Risk, Operational Risk, Regulatory and Economic Capital, all of which uniquely share a common analytical infrastructure comprising a unified financial services data model, shared analytical computations and finally, the industry-leading business intelligence platform.

**Contact Us**

For more information about Oracle Financial Services Market Risk, visit oracle.com or call +1.800.ORACLE1 to speak to an Oracle representative.

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