

Risk Management

A comprehensive approach to market risk management is one of the determinants of modern and efficient risk control policy. Comarch's Asset Management platform solutions provide complete supervision of market risk. The user has access to the application functionality, responsible for active risk assessment of the managed portfolios, using self-created analysis and verification of the utilized solutions and management strategies. As well as supporting a wide range of financial instruments, the system allows the use of complex derivative market products which can hedge the potential areas of risk in business. The application allows managers to make more effective investment decisions, which translates into an increase in the competitiveness of the institution on the market.

Business and operational benefits

Business benefits:

- » Active risk assessment of managed portfolios - based on the analysis of current portfolio positions and potential changes in portfolio structure or market data - creates effective hedging against adverse market factor fluctuations such as: exchange rates, interest rates, equity and commodity quotations
- » Risk source identification by decomposition of the portfolios and securities on basic factors
- » Maintaining the accuracy of used risk models through the use of a statistical testing (backtesting)
- » Calculating the potential maximum loss in the managed portfolios (VaR methodologies)
- » Portfolio analysis based on what-if scenarios and stress-testing
- » Calculating the price of derivatives or structured instruments before purchase, giving a real base for price negotiations with the institution offering the product
- » Increasing competitiveness through the use of innovative products from the derivative market

Operational benefits:

- » Access to applications through a web browser eliminates the need to install a development environment on the user's computer
- » Intuitive and ergonomic user interface
- » Interactive charts and tables
- » Drill-down analysis
- » Automation of the processes with scheduler functionality
- » Possibility of integration with different external systems (market data systems, transaction systems)
- » Calculation logs
- » Notice of process completion
- » Granting access to presented information for chosen user groups

Utilized solutions

RISK RATIOS	<p>Ratios:</p> <ul style="list-style-type: none"> » Value at Risk (absolute/relative/benchmark) » Conditional Value at Risk » Incremental Value at Risk » Marginal Value at Risk <p>Methodology:</p> <ul style="list-style-type: none"> » Historical simulation » Monte Carlo simulation » Variance-Covariance » Delta-Gamma (Cornish-Fisher) » Extreme Value Theory
BACKTESTING	<ul style="list-style-type: none"> » P/L vs VaR » Kupiec tests » Berkowitz test
SENSITIVITIES RATIOS	<ul style="list-style-type: none"> » Beta » Duration, MDuration, Convexity, BPV » Greeks
Data calculations	<ul style="list-style-type: none"> » Rate of return dynamics: Vasicek model, CIR, Ornstein-Uhlenbeck, Black-Scholes
Supported derivatives	<ul style="list-style-type: none"> » Futures » Forward (FX, FRA) » Swap (FX, CIRS, IRS) » Vanilla option » Exotic option
Valuation methodologies	<ul style="list-style-type: none"> » Black-Scholes model » Cox-Ross-Rubinstein model » Monte Carlo methodology
STRESSTESTING	<ul style="list-style-type: none"> » Predefined historical scenarios: Asian crisis, Russia crisis, September 11th 2001, Subprime Debacle » User-defined scenarios



Key features

Risk exposure analysis

The functionality enables a clear and quick preview of the current portfolio's positions as well as calculated risk exposure. With wide configuration possibilities – through tables and charts – the user can define aggregation levels (e.g. portfolio, security, currency, sector, issuer), the scope of the presented positions with self-defined filters and a list of the calculated ratios and their parameterization. An interactive interface allows the user to drill-down presented data in order to get a deeper view of the risk position from the portfolio level – through to sectors or the currency level – down to the single instrument. The functionality enables the presentation of risk factors, decomposed and aggregated through the portfolio's positions, that take into account the sensitivity of the positions' value to the risk factor's fluctuations.

Risk ratios

Risk ratios (Value at Risk) offer an opportunity to estimate maximum, potential future losses in the instrument portfolio, thereby affecting an effective protection against adverse changes in market forces. The manager can view the risk of his portfolio in different sections: currency, sectors, regions and instrument class. This helps to verify the most risky areas of investment. Moreover, the backtesting functionality helps to verify the correctness of the risk models based on historical data, which minimizes the consequences of incorrect model usage.

Risk decomposition

This functionality allows the decomposition of the portfolio risk by individual securities or asset groups (sectors, regions, currency, instrument class) in order to identify all the sources of risk. Risk decomposition construction, based on a performance attribution approach, uses marginal risk calculations on different risk measures (volatility, tracking error, value at

risk) to analyze the impact of the different investment areas on the overall risk of the investment portfolio. The tool can be successfully used in the risk budgeting process.

Sensitivity analysis

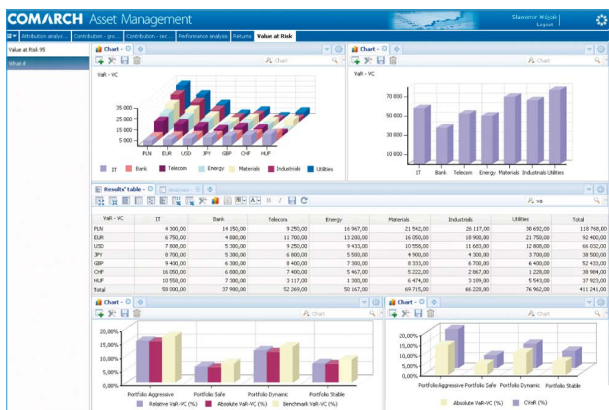
Sensitivity analysis increases transparency in identifying the impact of various market factor fluctuations in the value of individual positions, or the whole portfolio, and allows an effective financial instrument comparison and quicker transaction decisions.

'What-if' scenario analysis

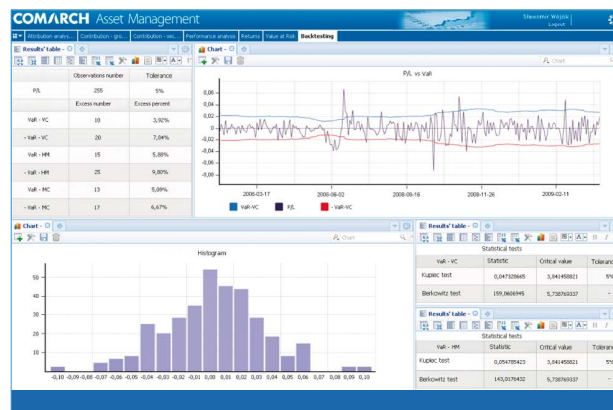
This functionality creates a simulation of an analysis based on a hypothetical assumption about market movements or the portfolio's structure modifications. It increases portfolio management efficiency by maximizing returns and minimizing investment risk. The system is able to create analysis based on the quantity and shares. It can also create an instrument value simulation or designed virtual portfolios. The functionality possesses the option to alter market data according to historical scenarios, large stock market fluctuations (stress testing) or user-initiated changes (ex. yield curve shifts). Various analysis can be conducted using the simulated data.

Derivatives and structured products

Support of derivatives and structured products with a specific structure and defined underlying instrument, gives asset managers the opportunity to use financial instruments, which could adequately hedge risk areas of their activity. Additionally, the system can calculate the current value of derivative instruments portfolio as well as estimating the actual price of the instrument prior to its acquisition on the market or directly from the offering party. This, therefore, gives ground for price negotiations with the institution offering the financial product.



Value at Risk analysis



Backtesting

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