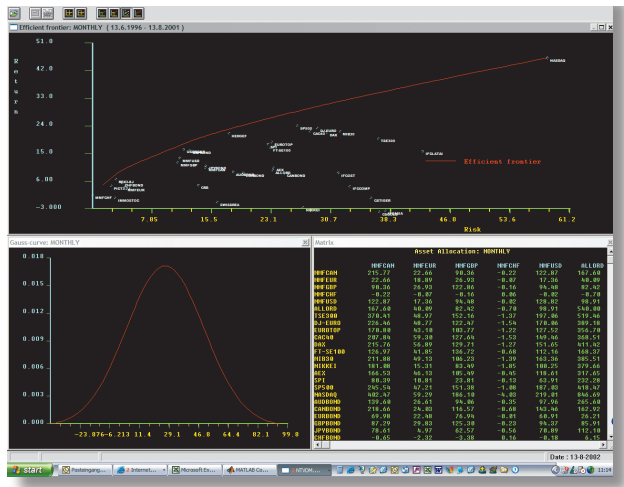


Expersoft Develops Portfolio Management Software in Half the Time Using MATLAB®



PM1-e portfolio management system.

THE CHALLENGE

To develop a portfolio management application that would be easy to use and could perform complex calculations quickly

THE SOLUTION

Use MATLAB and related toolboxes to develop and test algorithms for portfolio optimization software

THE RESULTS

- Development time cut by 50%
- Routines simplified
- Time-consuming programming tasks eliminated

Expersoft Systems AG, based in Switzerland, manages the portfolios of hundred of banks, brokers, financial service providers, and insurance companies worldwide. To ensure that their clients receive an optimal return on investment, Expersoft must accurately forecast and respond to fluctuations in the stock market. Their new portfolio management tool, PM1-e, helps them meet this objective by calculating these fluctuations.

Expersoft developed and optimized PM1-e using MATLAB® and Financial Toolbox. According to Managing Director Jean-Frederic Gueret, these tools enabled Expersoft to develop their new application in just 50% of the time it would have taken with C/C++.

“MATLAB has become essential for our development team,” Gueret says. “We were surprised at how easy it was to use. We only had to learn minor rules of syntax and how to work with matrices. This saved us a lot of time. Thanks to MATLAB, we have more time to dedicate to our product’s actual functionality.”

THE CHALLENGE

Expersoft set out to develop a software program that would meet the specialized demands of portfolio management. These included accessing information instantly to make investment decisions quickly, such as portfolio comparisons, analytics, performance history, and recent transactions.

To supply portfolio managers with key information on the evolution of risks, this program would need to calculate risks, such as Sharpe and Sortino ratios, Treynor index, beta, and tracking error, using a variety of calculation models. To minimize risks and define them clearly, the software must also consider and display risk-influencing factors, such as timing/weight, market situation, and exchange rate fluctuations.

“Meeting these demands required the development of complex algorithms, such as polynomial regression, Markowitz, and Black-Scholes, which would have been very time-consuming to code in C/C++,” says Gueret.

“ We would not have been able to complete this project within the same time-scale had it not been for MATLAB.”

Jean-Frederic Gueret, Expersoft Systems AG

THE SOLUTION

The Expersoft team chose MATLAB as their development environment. “We were impressed by the MATLAB financial modeling and analysis products and by the fact that MATLAB routines can be converted into C and C++,” Gueret says. “Another primary reason we chose MATLAB was for its ability to compute portfolios along the efficient frontier.”

The Expersoft team used MATLAB extensively for developing and testing algorithms for PM1-e. MATLAB helped them test hypotheses and formulas. For example, they were looking for a way to identify outliers and correct gaps in price series. They used MATLAB to connect to their database and then used Financial Toolbox to explore function fills. Using this method, they quickly determined that it was not possible to determine outliers accurately, and so were able to avoid wasting valuable development time on exploring this possibility further.

MATLAB graphical tools also helped them test PM1-e functionality. “The easiest way to determine whether a point of tangent to efficient frontier is calculated correctly is to draw the efficient frontier, the result point, and the tangent. Using MATLAB visualization tools, you see immediately if the results are not correct,” explains Gueret.

Expersoft will continue to use MATLAB for developing future versions of PM1-e and other products, including a Risk Options/Futures module of PM1-e for valuation.

THE RESULTS

■ Development time cut by 50%.

“MATLAB saved us a lot of work, especially with complex and time-consuming algorithms,” says Gueret, who estimates that because of the ease of developing mathematical routines in MATLAB, Expersoft reduced their development time by approximately 50%.

■ Routines simplified.

“MATLAB makes all the functions that we’ve programmed very easy to read. We don’t even need to add comments,” says Gueret.

■ Time-consuming programming tasks eliminated.

“With MATLAB, we were spared from programming many numerical methods, such as value-at-risk. It is possible to program numerical calculations of the integral of probability density function using C/C++ or other programs, but the MATLAB `portrisk` function makes this task far easier.”

To learn more about Expersoft Systems AG, visit www.expersoft.ch

APPLICATION AREAS

- Financial modeling and analysis
- Algorithm development
- Data analysis
- Computation

PRODUCTS USED

- MATLAB
- Financial Toolbox

www.mathworks.com