Financial Toolbox 3

Analyze financial data and develop financial algorithms

The Financial Toolbox extends MATLAB®, the Statistics Toolbox, and the Optimization Toolbox with functions for mathematical and statistical analysis of financial data. Using the Financial Toolbox you can optimize portfolios, estimate risk, analyze interest rate levels, price equity derivatives, and handle financial time series.

Asset Allocation, Portfolio Optimization, and Risk Analysis

A comprehensive suite of portfolio optimization and analysis tools lets you:

- Estimate asset return and total return moments from price or return data

- Simulate asset return time series

- Compute portfolio-level statistics

- Perform constrained mean-variance optimization and analysis

- Examine the time evolution of efficient portfolio allocations

- Perform capital allocation

Cash Flow Analysis

Time-value-of-money functionality lets you:

- Calculate present and future values

- Determine nominal, effective, and modified internal rates of return

- Calculate amortization and depreciation

- Determine the periodic interest rate paid on a loan or annuity

Using the Financial Toolbox with MATLAB enables you to create a range of interactive applications, including models for optimizing portfolios (top) and for pricing equity options (center and bottom).

KEY FEATURES

- Asset allocation, portfolio optimization, and risk analysis
- Cash flow analysis
- Basic SIA-compliant fixed-income security analysis
- Basic Black-Scholes, Black, and binomial option pricing
- Financial time series and date math tools
- Basic GARCH estimation, simulation, and forecasting
- Regression and estimation with missing data
- Functions for computing technical indicators and creating financial charts
- Utilities for handling financial data
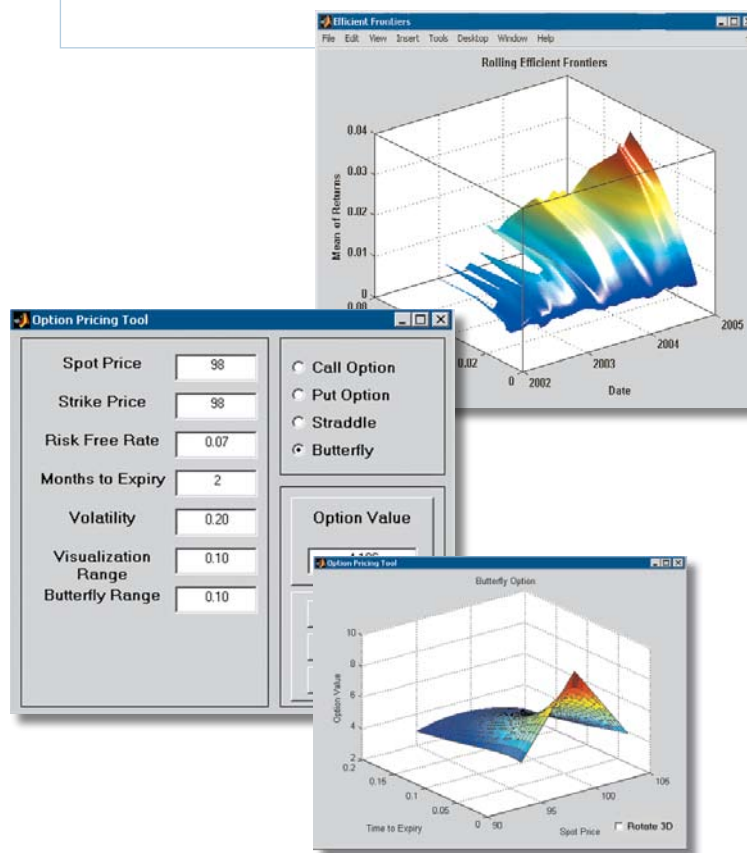
Basic SIA-Compliant Fixed-Income Security Analysis

Securities Industry Association (SIA)-compatible analytics are provided for pricing, yield, and sensitivity analysis for government, corporate, and municipal fixed-income securities. Specific analytics include:

- Complete cash flow date, cash flow amounts, and time-to-cash-flow mapping for a bond

- Price and yield-to-maturity

- Duration and convexity

You can price stepped and zero coupon bonds with the Fixed-Income Toolbox (available separately).

Basic Black-Scholes, Black, and Binomial Option-Pricing

The Financial Toolbox provides tools that let you:

- Use a standard market model of equity pricing with Black and Black-Scholes formulas

- Compute the sensitivities of option greeks, such as lambda, theta, and delta

With the Financial Derivatives Toolbox (available separately), you can price equity and fixed-income derivatives using a wide range of models and methods, including Heath-Jarrow-Morton and Cox-Ross-Rubinstein models.

Financial Time Series and Date Math Tools

The Financial Toolbox includes a financial time series object that handles:

- Date math, including business days and holidays

- Data transformation and analysis

- Technical analysis

- Charting and graphics

Basic GARCH Estimation, Simulation, and Forecasting

The Financial Toolbox includes tools to work with univariate GARCH models. These tools let you:

- Estimate parameters of a univariate GARCH(p, q) model with Gaussian innovations

- Simulate univariate GARCH(p, q) processes

- Forecast conditional variances

With the GARCH Toolbox (available separately) you can work with additional GARCH models.

Regression and Estimation with Missing Data

The Financial Toolbox provides tools for performing multivariate normal regression with or without missing data. You can:

- Perform common regressions based on the underlying model, such as seemingly unrelated regression (SUR)

- Estimate log-likelihood function and standard errors for hypothesis testing

- Complete calculations in the presence of missing data

Functions to Compute Technical Indicators and Create Financial Charts

Numerous well-known technical indicators and specialized plots are provided in the toolbox. These include:

- Moving averages

- Oscillators, stochastics, indexes, and indicators

- Tools for computing maximum drawdown and expected maximum drawdown

- Charting tools, including Bollinger bands, candlestick plots, and moving averages

Required Products

MATLAB
Optimization Toolbox
Statistics Toolbox

Related Products

Database Toolbox. Exchange data with relational databases

Datafeed Toolbox. Acquire financial data from data service providers

Financial Derivatives Toolbox. Model and analyze equity and fixed-income derivatives

Fixed-Income Toolbox. Model and analyze fixed-income securities

GARCH Toolbox. Analyze financial volatility using univariate GARCH models

Platform and System Requirements

For platform and system requirements, visit *www.mathworks.com/products/finance* ∎

For demos, application examples, tutorials, user stories, and pricing:

- Visit **www.mathworks.com**

- Contact The MathWorks directly

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