

Financial Toolbox 2.4

Analyze financial data and develop financial algorithms

The Financial Toolbox extends MATLAB® and the Statistics and Optimization toolboxes with a rich set of functions for mathematical and statistical analysis of financial data. Using the Financial Toolbox you can optimize portfolios, determine risk, analyze interest rate levels, price equity derivatives, and handle and convert business dates.

Asset Allocation, Portfolio Optimization, and Risk Analysis

With the Financial Toolbox, you can determine optimal trade-offs between risk and return. A comprehensive suite of tools lets you:

- Convert price-tick time series to return time series and back
- Estimate asset return and covariance data from returns data, with optional exponential weighting
- Simulate multiasset return time series
- Derive the efficient frontier using basic and advanced constraint sets
- Specify portfolio constraints, allocation bounds, group allocation bounds, and group-to-group composition bounds
- Derive portfolio value, risk, and expected return

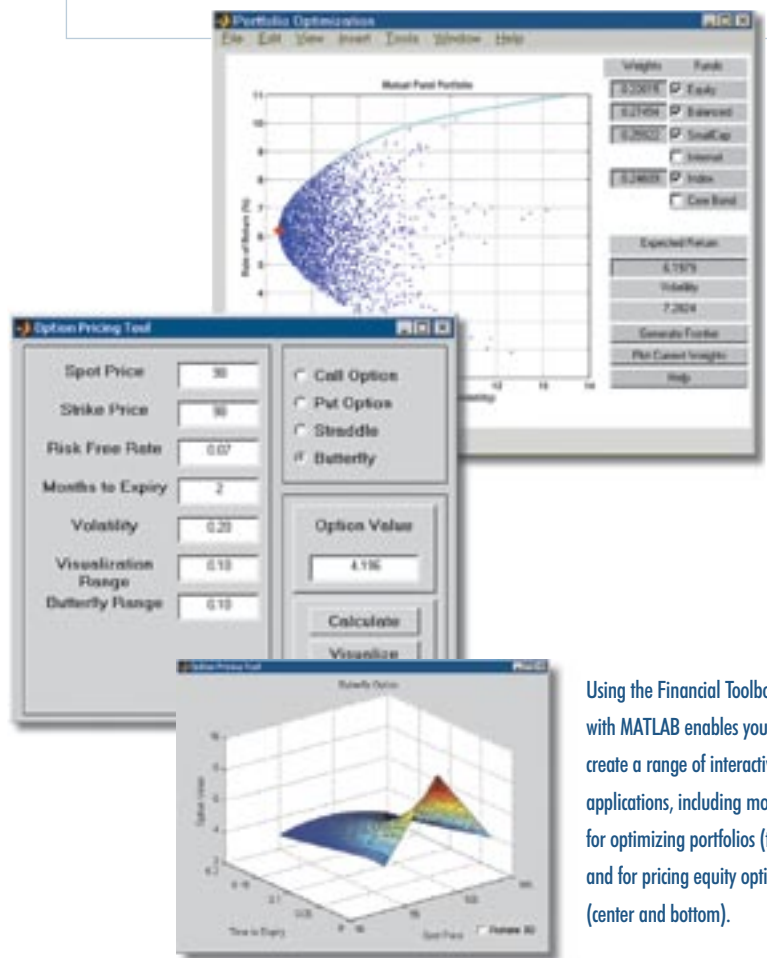
Cash Flow Analysis

Time-value-of-money functionality lets you:

- Calculate present and future value
- Determine nominal, effective, and modified internal rates of return
- Calculate amortization and depreciation
- Determine the periodic interest rate paid on a loan or annuity

KEY FEATURES

- Asset allocation, portfolio optimization, and risk analysis
- Cash flow analysis
- Standard fixed-income security analysis
- Utility functions for handling dates, formatting currency, and creating financial charts
- Black's and Black-Scholes option-pricing functionality



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).



Sample Functions

Efficient frontier with arbitrary constraint set

Portfolio value at risk

Price bonds from a zero curve

Bootstrap zero rate curve from market bond prices

Bootstrap zero rate curve from market bond yields

Forward curve given a zero curve

Black's option pricing

Black-Scholes put and call values

Internal rate of return

Present value with fixed periodic payments

Standard Fixed-Income Security Analysis

Securities Industry Association (SIA)-compatible analytics are provided for pricing, yield, and sensitivity analysis. Security types include U.S. Treasury bills, bonds, and notes; corporate bonds; and municipal bonds. Bonds may have long, normal, or short first or last coupon periods and may be forward starting. Specific analytics include:

- Complete cash flow date, cash flow amounts, and time-to-cash-flow mapping for a bond
- Price and yield maturity
- Duration
- Convexity

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

Equity Derivatives Pricing

The Financial Toolbox provides tools for general types of options and their sensitivities (greeks) using the Black-Scholes formula. These tools include:

- Standard market model of equity pricing with Black and Black-Scholes formulas
- Simple building block for a larger calibration set of tools to support market activity

With the Financial Derivatives Toolbox (available separately), you can price equity and fixed-income derivatives using Heath-Jarrow-Morton, Cox-Ross-Rubinstein, and other modeling methods.

Utility Functions

The toolbox provides a comprehensive set of tools for handling dates, formatting currency, and charting financial data. You can:

- Identify business days, holidays, and working days between set time periods
- Create candlestick, Bollinger band, high-low, and moving average charts

Required Products

MATLAB

Optimization Toolbox

Statistics Toolbox

Related Products

Financial Derivatives Toolbox. Model and analyze fixed-income derivatives

Financial Time Series Toolbox. Analyze and manage financial time series data

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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