MSCI

Barra Optimizer

An open software library that enables integration of the Barra optimization engine in investment platforms

Barra
An MSCI Brand

Barra Optimizer delivers innovative optimization techniques in an open, flexible software library that can be easily integrated into most investment platforms. It can be used to address a variety of optimization problems ranging from large-scale convex and non-convex cases to more complex combinations of quadratic, nonlinear or mixed-integer constraints.

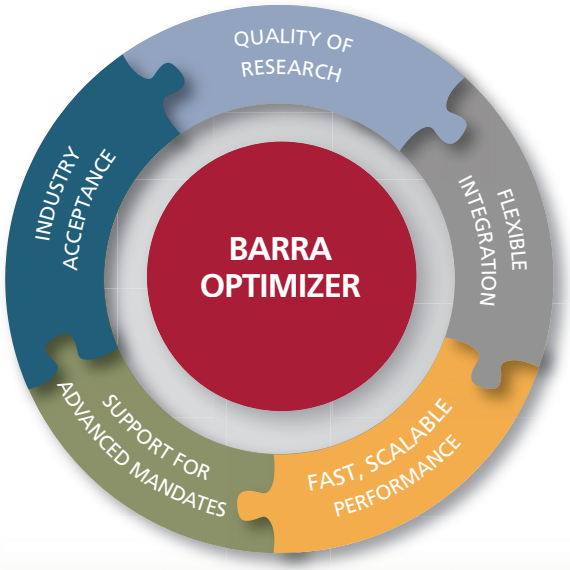
Key Benefits

Quality of Research — The Barra Optimizer incorporates proprietary solvers developed in-house by MSCI's optimization research team. The team continues to support client needs as the investment landscape grows increasingly complex with innovative white papers on optimization.

Flexible Integration — An intuitive programming API, available in C++, Java™ and COM, provides an easy integration with most libraries within statistical tools such as MATLAB™ and SAS™. Documentation and working sample code are included to help accelerate integration time.

Fast, Scalable Performance — The Barra Optimizer takes advantage of the special structure of multi-factor risk models employed by many portfolio managers, providing fast results to large scale problems. Users can refine their large-scale strategies or manage day-to-day portfolio operations interactively.

OPTIMIZER: Create optimal portfolios that reflect your desired risk/return tradeoffs, institutional constraints and other parameters.



Support for Advanced Mandates — Asset managers can leverage Barra Optimizer's heuristic algorithms to implement convex and non-convex cases with a wide array of quadratic and mixed-integer constraints. Long/short portfolios with leverage bounds and risk targets, or passive benchmark replicators with a constraint on the number of names they can hold, are just two of the many types of mandates that Barra Optimizer users can implement.

Industry Acceptance — The Barra Optimizer engine powers the Barra Aegis, BarraOne and Barra Portfolio Manager platforms which are used by a wide range of institutional investors.

Key Features

- Penalizes residual alpha in optimization to correct alpha and risk factor misalignment
- Offers trade paring to limit number of trades/buys/sells
- Applies fixed transaction costs per trade in addition to piecewise-linear and non-linear transaction costs
- Provides soft bounds and constraints on leverage, risk, round-lotting and other settings
- Creates a more flexible constraint hierarchy with the ability to set priority levels for factor constraints
- Enhances long/short optimization with new leverage constraints, round-lotting, additional paring constraints, and non-convex risk constraints
- Allows efficient frontier optimizations
- Apply round-lot constraints during or after optimization
- Supports multiple risk terms in the objective function
- Enables user to prioritize soft-bounds and constraints to increase likelihood of feasibility
- Allows user control of optimality tolerance
- Contains dual risk models and multiple benchmarks
- Maximizes information ratio and/or Sharpe ratio
- Offers a fully parameterized mean-variance utility function

Advanced Constraints

- Bounds on total or active risk at portfolio or sub-group level
- Maximum limit on piecewise-linear transaction costs
- Constraints on maximum and/or minimum number of assets, trades and more

Hedge (Long/Short) Optimization

- Constraints on leverage for longs, shorts and turnover that can be defined independently by side
- Paring constraints on holding or transaction levels on long or short side
- Targets and constraints on risk
- Modeling of short costs

Tax-Aware Optimization

- Bounds on long- and short-term gross gains or losses for tax arbitrage
- Tax lotting, with HIFO, LIFO and FIFO trading rules
- Multiple options for handling wash sales

Technical Highlights

- APIs are available in C++, Java™ and COM (allowing integration with Microsoft .Net and Excel® platforms)
- Library can be incorporated into statistical packages of MATLAB™, SAS™ and R with examples included
- Package is available for 64 bit machines running Microsoft Windows® and Linux® environments
- Complete package includes programmers' references, tutorials and working sample code for all supported development languages
- Optimizer has minimal baseline system requirements

[1] *As of June 30, 2011, based on eVestment, Lipper and Bloomberg data.*