Barra Open Optimizer 9.2 Release Notes

December 2021

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Barra Open Optimizer 9.2 Release

Introduction

This version of Barra Open Optimizer includes major enhancements to Tax-Aware Optimization. It also introduces general convex quadratic risk constraints for single portfolio optimization and non-linear transaction costs in Multi-Period Optimization.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through MSCI products such as Barra PortfolioManager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic features of Barra Open Optimizer 9.2 include the following:

- Support for the “Trade-Off Wash Sales” option in tax-aware optimization
- Support for general convex quadratic risk constraints (upper bound only) for single portfolio optimization
- Support for non-linear transaction costs in the objective of each period of a multi-period optimization

Enhancements and Bug Fixes

Major enhancements and bug fixes of Open Optimizer include the following:

- Generate asset-level capital gain/loss information in output of tax-aware optimization *(OPTSERVER-1729)*
- Application crashes for a large-scale tax-aware case *(OPTSERVER-2561)*
- Non-linear transaction costs can be handled by the second-order cone solver for any power. *(OPTSERVER-2703)*
- Added options for eliminating tiny trades produced by the second-order cone solver *(OPTSERVER-2779)*
- Fixed an issue in which not all general PWL constraints were saved to XML. *(OPTSERVER-2649)*
- Fixed an issue in which the optimizer crashed when opening a WSP file with unexpected file version *(OPTSERVER-2687)*
- Fixed an issue in which the *TaxExcluded* attribute of assets were not saved to XML. *(OPTSERVER-2693)*

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 9.2, updated from Barra Open Optimizer 9.1.1:

Class/Enum	C++ API Changes
CQuadraticConstraints	**New Class**
EConsType	**New member:** eQUADRATIC_CONS
CPortfolio	**Modified member function:** AddWashSaleRec() returns a string now
CSymmetricMatrix	**New Class**
CConstraints	**New member functions:** InitQuadraticConstraints() and GetQuadraticConstraints()
CWashSaleDetail	**New member function:** GetDisallowedLotID()
CNewTaxOutput	**New member functions:** GetCapitalGain() and GetTotalCapitalGain()
CWorkSpace	**New member functions:** GetLastError() and CreateSymmetricMatrix()

Previous Barra Open Optimizer Releases

For information about the previous releases of Barra Open Optimizer, see the following sections:

Barra Open Optimizer 9.1.1 Release Notes

Barra Open Optimizer 9.0.3 Release Notes

Barra Open Optimizer 8.9.1 Release Notes

Barra Open Optimizer 8.8.1 Release Notes

Barra Open Optimizer 8.7 Release Notes

Barra Open Optimizer 8.6 Release Notes

Barra Open Optimizer 8.5 Release Notes

Barra Open Optimizer 8.4 Release Notes

Barra Open Optimizer 8.3 Release Notes

Barra Open Optimizer 8.2 Release Notes

Barra Open Optimizer 8.1 Release Notes

Barra Open Optimizer 8.0 Release Notes

Barra Open Optimizer 2.1 Release Notes

Barra Open Optimizer 2.0 Release Notes

Barra Open Optimizer 1.3 Release Notes

Barra Open Optimizer 9.1.1 Release

Introduction

This release of Barra Open Optimizer introduces Expected Shortfall Optimization, an important new feature that allows users to control the downside risk of portfolios. In addition, it includes enhanced functionalities for Multi-Account Tax-Aware Optimization and Risk Parity Optimization.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through MSCI products such as Barra PortfolioManager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic features of Barra Open Optimizer include the following:

Open Optimizer 9.1.1:

- Support for Total Gain/Loss/Net constraint
- Support for ratio constraint

Open Optimizer 9.1.0

- Expected Shortfall Optimization:
  - Support for Expected Shortfall term in the utility
  - Support for Expected Shortfall constraint
  - Support for Target Mean Return constraint
- Multi-Account Tax-Aware Optimization:
  - Support for account grouping and tax limit on an account group
  - Addition of a new approach (Total Welfare + Direct Solve)
- Support for Loss Benefit term in the utility of Tax-Aware Optimization
- Enhanced Risk Parity Optimization:
  - Support for active-risk parity in addition to total-risk parity at asset level
  - Support for total-risk parity and active- risk parity at factor level
  - Support for shorting of assets

Enhancements and Bug Fixes

Major enhancements and bug fixes of Open Optimizer include the following:

Open Optimizer 9.1.1

- Upgraded and tuned the SOCP solver (Mosek v9.2) to improve performance and support newer AMD CPUs *(OPTSERVER-1936, OPTSERVER-2628)*
- Support to change penalty rate for soft constraints *(OPTSERVER-2686)*
- Enhanced `CSolver::InputVerify()` to verify tax lots inputs *(OPTSERVER-2661)*
- Fixed an issue in which the loss benefit term was not included to the output utility values *(OPTSERVER-2716)*
- Fixed an issue in which incorrect tax lots were picked for short covering *(OPTSERVER-2705)*
- Fixed an issue in which frontier data points were out of the specified range *(OPTSERVER-2679)*
- Fixed an issue in which general PWL constraints were not serialized to XML *(OPTSERVER-2649)*
- Fixed an issue in which `NUM_TAX_EXCLUDED_ASSETS` was not getting serialized correctly for XML file *(OPTSERVER-2693)*
- Fixed an issue in which no portfolio was returned for an infeasible case *(OPTSERVER-2695)*
- Improved the performance of MCTE calculation when the workspace contained assets which were missing from the investment universe *(OPTSERVER-2706)*
- Fixed an issue in which `CPWLinearFunction::IsConvex()` returned incorrect value *(OPTSERVER-2725)*
- Fixed an issue in which Multi-Period Optimization cases reported wrong transaction costs *(OPTSERVER-2616)*
- Fixed an issue in which default asset bounds were too small for hedge cases *(OPTSERVER-2704)*
- Fixed an issue in which slack values of net tax arbitrage constraints were incorrect *(OPTSERVER-2708)*

Open Optimizer 9.1.0

- Improved license check *(OPTSERVER-2334)*
- Support for to retrieving tax with CTax/CNewTax/CTaxRule fields *(OPTSERVER-2505)*
- CPUTime/Elapsed time is now reported in the API and output files *(OPTSERVER-2519)*
- Enhanced CIDSet and CAttributeSet Python classes *(OPTSERVER-2399)*
- Enhanced printable representation of Python objects *(OPTSERVER-2526)*
- Fixed an issue in which optimizer crashed when loading input file with Linux line ending *(OPTSERVER-2207)*
- Fixed an issue about timeout checks on Linux *(OPTSERVER-2276)*

- Fixed an issue in which pre-arrange returns were infeasible when direct-solve was used to solve the optimization case *(OPTSERVER-2391)*
- Fixed an issue about missing wash sale details *(OPTSERVER-2536)*
- Fixed an issue about handling +-OPT_INF bounds in relative constraints *(OPTSERVER-2552)*
- Fixed an issue in which AB / Tax Aware Optimization was not running when tax parameter = 1 *(OPTSERVER-2560)*
- Fixed an issue in which optimizer crashed when generating XML output of Utility-Tax frontier *(OPTSERVER-2562)*
- Fixed an issue in which the asset trade list contained wrong dollar values in multi-account optimization cases *(OPTSERVER-2615)*
- Fixed an issue in which the user entered large values for taxlot ages that exceeded the character limit of the underlying short integer type *(OPTSERVER-2596)*

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 9.1.1, updated from Barra Open Optimizer 9.1.0:

Class/Enum	C++ API Changes
EConsType	**New members:** eRATIO_CONS, eTOTAL_NET, eTOTAL_GAIN, eTOTAL_LOSS
CNewTax	**New member functions:** SetTotalLossCarryForward(), SetExcludeTaxFreeFromTotalGain(), GetTotalLossCarryForward(), IsTaxFreeExcludedFromTotalGain()
CNewTaxConstraints	**New member functions:** SetTotalTaxArbitrageRange()
CNewTaxOutput	**New member functions:** GetTotalCapitalGain()
CRatioConstraints	**New Class**
CConstraints	**New member functions:** InitRatioConstraints(),GetRatioConstraints()

The following table lists the C++ API changes in Barra Open Optimizer 9.1, updated from Barra Open Optimizer 9.0.3:

Class/Enum	C++ API Changes
EConsType	**New members:** eEXPECTED_SHORTFALL, eTARGET_MEAN_RETURN
EStatusCode	**New members:** eINFEASIBLE_DUETO_RISKPARITY
ERiskParityType	**New Enum**
EScenarioReturnType	**New Enum**

Class/Enum	C++ API Changes
CPWLinearFunction	**New Class**
CTaxLot	**New Class**
CPortfolio	**New member functions:** GetTaxLotIDs(), GetTaxLot()
CAsset	**New member functions:** GetPWLinearTransactionCost()
CUtility	**New member functions:** SetLossBenefitTerm(), SetExpectedShortfallTerm(), GetLossBenefitTerm(), GetExpectedShortfallTerm()
CTax	**New member functions:** IsCrossNettingGainLossEnabled(), IsTwoRateEnabled(), GetShortTermPeriod(), GetLongTermTaxHarvestingTarget(), GetLongTermTaxHarvestingPenalty(), GetShortTermTaxHarvestingTarget(), GetShortTermTaxHarvestingPenalty(), GetLongTermLossCarryForward(), GetShortTermLossCarryForward(), GetSellingOrderRule(), GetTaxUnit(), GetLongTermTaxRate(), GetShortTermTaxRate(), GetWashSaleRule(), GetWashSalePeriod()
CTaxRule	**New member functions:** IsTwoRateEnabled(), GetShortTermPeriod(), GetLongTermTaxRate(), GetShortTermTaxRate(), GetWashSaleRule(), GetWashSalePeriod(), GetLossCarryForward(), IsCrossNettingGainLossEnabled()
CNewTax	**New member functions:** GetNumTaxRuleGroups(), GetTaxRuleGroupName(), GetTaxRuleGroupAttribute(), GetTaxRule(), GetTaxHarvestingTarget(), GetTaxHarvestingPenalty(), GetSellingOrderRule(), GetLossCarryForward()
CMAOTax	**New member functions:** GetTaxRuleGroupName(), GetTaxRuleGroupAttribute()
CExpectedShortfall	**New Class**
CLinearConstraints	**New member functions:** SetExpectedShortfallConstraint(), SetTargetMeanReturnConstraint()
CRiskConstraints	**New overloaded member function:** SetRiskParity()
CFrontier	**New member functions:** GetFrontierType(), GetFrontierLowerBound(), GetFrontierUpperBound(), GetMaxNumDataPoints(), GetFrontierConstraintID(), IsTransactionCostIncluded(), GetFrontierBoundType()
CAccount	**New member functions:** GetID(), GetGroupID()
CCase	**New member functions:** GetExpectedShortfall(), InitExpectedShortfall()
CDataPoint	**New member function:** GetExpectedShortfall()
CFrontierOutput	**New member functions:** GetCPUTime(), GetElapsedTime()
CNewTaxOutput	**New member function:** GetTotalLossBenefit()
CAccountGroupTaxOutput	**New Class**
CRiskParityInfo	**New Class**
CPortfolioOutput	**New member functions:** GetCPUTime(), GetElapsedTime(), GetRiskParityInfo()

Class/Enum	C++ API Changes
CMultiPeriodOutput	**New member functions:** GetCPUTime(), GetElapsedTime()
CMultiAccountOutput	**New member functions:** GetAccountGroupTaxOutput(), GetNumAccountGroups(), GetCPUTime(), GetElapsedTime()

CSolver	**Additional parameter for:**
	AddAccount()
	New member functions:
	GetAccount(), GetNumAccountGroups()

CWorkSpace	**New member functions:** GetLicenseStatus(), SwitchAccountGroup(), GetAccountGroup()

The following API elements are deprecated in 9.1 and may be removed in the next major release:

Class/Enum	Deprecated members
ERiskConsQuery	eRELATIVE_RISK
CParingConstraints	SetNumLongs(), SetNumShorts(), SetMinNumAssets(), SetMaxNumAssets(), SetMinNumLongs(), SetMaxNumLongs(),SetMinNumShorts(), SetMaxNumShorts(),SetMinHoldingLevel4Long(), SetMinHoldingLevel4Short(), SetMinTranxLevel4Long(), SetMinTranxLevel4Short(), SetMinNumTrades(), SetMaxNumTrades(), SetMinNumLongTrades(), SetMaxNumLongTrades(), SetMinNumShortTrades(), SetMaxNumShortTrades(), SetMinNumBuys(), SetMaxNumBuys(), SetMinNumSells(), SetMaxNumSells()
CRiskConstraints	SetRiskParity(bool, bool)
CPortfolioOutput	GetCPU()
CSolver	EvaluateRiskContribution()

Barra Open Optimizer 9.0.3 Release

Introduction

This release of Barra Open Optimizer introduces Multi-Account Tax-Aware Optimization, a significant new feature that combines the existing functionalities of multi-account optimization and tax-aware optimization. In addition, it has enhanced functionalities for risk-constrained optimization by allowing lower bounds on most risk and risk contribution constraints.

Barra Open Optimizer 9.0 has also initiated API support for Python 3.8.
Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through MSCI products such as Barra PortfolioManager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic features of Barra Open Optimizer include the following:

Open Optimizer 9.0.3:

- Support for 5/10/40 rule in combination with risk target optimization

Open Optimizer 9.0.1:

- Support for post-optimization roundlotting in multi-account optimization

Open Optimizer 9.0:

- Various tax-aware features in combination with multi-account optimization:
  - Support for multiple tax rules at account level
  - Support for disallowing wash sale rule at tax rule level
  - Tax arbitrage at asset group level for each account
  - Tax harvesting at asset group level for each account
  - Support for upper bound on total tax for each account
  - Support for upper bound on cross-account total tax
  - Support for trading rules at tax lot level
  - Support for minimum holding period at asset group level for each account
  - Support for exclusion of some assets from tax consideration
  - Support for tax-free tax lots
  - Support for tax-free accounts
  - Support for wash-sale-related accounts (This is a beta feature)
  - Support for fractional shares for tax lots
  - Support for short positions for assets and tax lots

- In addition to setting an upper bound currently, now users can also set a lower bound on:
  - Factor/specific risk contribution at portfolio level
  - Risk or risk contribution at portfolio level
  - Risk or risk contribution from a subgroup of assets
  - Risk or risk contribution from a subgroup of factors

Enhancements and Bug Fixes

Major enhancements and bug fixes of Open Optimizer include the following:

Open Optimizer 9.0.3:

- Added API function of `CSolver::GetOption()` *(OPTSERVER-2457)*
- Added options to allow dropping tiny weights during-optimization *(OPTSERVER-2370)*
- Removed interactive message with license check error *(OPTSERVER-2291)*
- Fixed an issue in which issuer constraint slacks were shifted by one *(OPTSERVER-2438)*
- Fixed an issue in which per-account utility was not properly adjusted based on per-account base value *(OPTSERVER-2441)*
- Fixed an issue in which tax lot information was not properly translated for assets missing from the initial portfolio *(OPTSERVER-2393)*
- Fixed an issue in which Nash Equilibrium approach reported infeasible incorrectly for some cases with cross-account tax constraint *(OPTSERVER-2402)*
- Fixed an issue in which cross-account tax limit was not binding but should be binding *(OPTSERVER-2372)*
- Fixed an issue in which unintuitive results were reported for some cases with soft turnover constraint *(OPTSERVER-2374)*
- Fixed an issue in which soft group paring constraints led to infeasibility *(OPTSERVER-2379)*

Open Optimizer 9.0.2:

- Provided an option to specify the number of threads used by the SOCP solver *(OPTSERVER-2307)*
- Added the asset ID in the error messages *(OPTSERVER-2330)*
- Added the cross-account tax slack value in the output *(OPTSERVER-2313)*
- Improved tax-aware heuristic approaches and successfully solved a use case that failed in previous Open Optimizer versions *(OPTSERVER-2331)*
- Enhanced logic for generating sufficient risk-return frontier data points *(OPTSERVER-2349)*
- Fixed an issue in which frontier optimization returned a suboptimal data point *(OPTSERVER-2322)*
- Fixed an issue in which lot trading rule info was lost when loading an XML file *(OPTSERVER-2335)*

- Fixed an issue in which optimizer crashed when using soft roundlot constraints *(OPTSERVER-2314)*
- Fixed an issue in which soft turnover bound caused no trade *(OPTSERVER-2315)*
- Fixed an issue in which a "tax and paring" use case failed in Open Optimizer 9.0 but was working correctly in Open Optimizer 8.9 *(OPTSERVER-2332)*
- Fixed an issue in which pre-arrange approach returned unexpected tracking error *(OPTSERVER-2325)*
- Fixed an issue in which direct-solve approach returned unexpected tracking error *(OPTSERVER-2326)*
- Fixed an issue in which tax arbitrage constraint was not enforced *(OPTSERVER-2331)*
- Fixed an issue in which IDset was not showing all assets *(OPTSERVER-2112)*
- Fixed an issue in which direct-solve approach returned incorrect turnover value *(OPTSERVER-2312)*
- Fixed an issue in which a warning message was displayed about paring constraint although paring constraint was not present in the use case *(OPTSERVER-2348)*
- Fixed an issue in which post-optimization reallocation of small trades or weights was wrong when the OPTIMAL_TRADE_ALLOCATION_MODE or OPTIMAL_WEIGHT_ALLOCATION_MODE option was set to 2 *(OPTSERVER-2351)*

Open Optimizer 9.0.1:

- Fixed an issue in which direct-solve method violated disallow-wash-sales rule in multi--account tax--aware optimization *(OPTSERVER-2266)*
- Fixed an issue in which wash-sale records of non-held assets were ignored *(OPTSERVER-2282)*
- Fixed an issue which caused the application to crash when `InputVerify()` method was called *(OPTSERVER-2283)*
- Fixed an issue with soft paring constraints in risk target optimization *(OPTSERVER-2287)*
- Fixed an issue in which `LoadModelsDirectData()` did not load ETF exposures and asset data *(OPTSERVER-2288)*
- Fixed an issue caused the application to crash when Nash Equilibrium approach was used in multi-account optimization *(OPTSERVER-2293)*
- Fixed issues which caused violation of the cross-account tax limit in multi--account tax-aware optimization *(OPTSERVER-2300, OPTSERVER-2301)*

Open Optimizer 9.0:

- Added API support for Python 3.8 *(OPTSERVER-2169)*
- Added support for JSON (JavaScript Object Notation) file format *(OPTSERVER-1494)*
- Improved the stability of paring results by fixing an issue in which `sort()` returned random orders for tied values *(OPTSERVER-2135)*
- Improved heuristic algorithms for handling the disallow-wash-sales rule for pre-arrange-lot approach, resulting better utilities and less infeasible cases *(OPTSERVER-2146 and OPTSERVER-2242)*

- Added a new procedure to improve the utility for cases with dual threshold constraints *(OPTSERVER-1959)*
- Enabled `LoadModelsDirectData()` to load data from PrecisionExposure files *(OPTSERVER-2170)*
- Fixed some issues that led to cycling iterations in paring heuristics (*OPTSERVER-2236)*
- Fixed an issue that led to unintuitive results for cases with soft paring constraints (*OPTSERVER-2241)*
- Fixed an issue in which `LoadModelsDirectData()` loaded LSR data incorrectly for the MAC model (MSCI Multi-Asset Class Factor Model) *(OPTSERVER-2077, OPTSERVER-2217)*
- Fixed memory leaks for utility/tax frontier in combination of level paring *(OPTSERVER-2238)*
- Fixed memory leaks of Intel MKL functions *(OPTSERVER-2116)*
- Fixed an issue in which `LoadModelsDirectData()` could not find the Factors.dat file of the MAC model *(OPTSERVER-2070)*
- Fixed an issue in which post-optimization roundlotting ignored the `allowCloseOut` option *(OPTSERVER-2138)*
- Fixed an issue which caused the application to crash if factor range penalty was used with dual risk models *(OPTSERVER-2215)*
- Fixed an issue in which relative factor bounds were ignored in multi-account optimizations *(OPTSERVER-2225)*
- Fixed an issue in which optimal weights and reported tax lots did not match (*OPTSERVER-2228*)
- Fixed an issue in which optimal trade sizes were off when there was cash-flow in a multi-account optimization *(OPTSERVER-2243)*
- Fixed an issue in which incorrect tax slack value was reported for utility/tax frontier cases *(OPTSERVER-2261)*

End of Support in Open Optimizer 9.0 and later versions

In Open Optimizer 9.0, support has been removed for the following:

- COM API
- Visual Basic applications
- Python 2 API

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 9.0.1, updated from Barra Open Optimizer 9.0:

Class/Enum	C++ API Changes
CMultiAccountOutput	**Additional parameter for:** WriteToFile()

The following table lists the C++ API changes in Barra Open Optimizer 9.0, updated from Barra Open Optimizer 8.9.1:

Class/Enum	C++ API Changes
EFileFormat	**New member:** eJSON
CAccount	**New Class**
CCase	**New member functions:** GetMAOTax(), InitMAOTax()
CCrossAccountConstraints	**New member functions:** GetTaxLimit(), SetTaxLimit()
CCrossAccountTaxOutput	**New Class**
CMAOTax	**New Class**
CMultiAccountOutput	**New member function:** GetCrossAccountTaxOutput()
CNewTax	**New member function:** GetTaxUnit()
CNewTaxConstraints	**New member functions:** GetConstraintIDSet(), GetConstraintInfo(), GetGroupName(), GetGroupAttribute()
CPortfolioOutput	**Additional parameter for:** WriteToFile()
CSolver	**Return type change for:** AddAccount()

Barra Open Optimizer 8.9.1 Release

Introduction

This release of Barra Open Optimizer adds native support for risk constraints at the individual asset level. Users can now set risk-by-asset or risk-contribution-by-asset constraints directly. This release also provides new user-friendly APIs for portfolio-level risk control and allows multiple linear terms in the objective. In addition, it extends the redesigned tax-aware functionality to the following optimization features:

- Risk-target optimization
- Return-target optimization
- Utility-tax frontier
- Portfolio-level risk constraints

This release enhances the capabilities of the ModelsDirect loader by adding support to load equity part of the MSCI Multi-Asset Class (MAC) Factor Model and exposures to currency factors.

Barra Open Optimizer 8.9 also introduces the API support for Python 3.7.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra PortfolioManager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.9 include the following:

Open Optimizer 8.9.1:

- Tax-aware optimization with portfolio-level risk constraints

Open Optimizer 8.9:

- Risk target optimization with tax-aware optimization (new structure)
- Return target optimization with tax-aware optimization
- Utility/tax frontier
- Risk contribution by asset
- Asset bounds with look-through capacity for composites

API Enhancements and Bug Fixes

Major API enhancements and bug fixes of Open Optimizer 8.9 include the following:

Open Optimizer 8.9.1:

- Added API functionality to support maximum trade size at asset-level *(OPTSERVER-1465)*
- Added API functionality to control the allocation of small trades and small weights in the optimal portfolio *(OPTSERVER-1321)*
- Added a new tutorial for scenarios involving combination of tax-aware optimization and cash outflow *(OPTSERVER-2005)*
- Fixed an issue in which memory leak was reported in the application *(OPTSERVER-2050)*
- Fixed an issue in which `Dispose()` was not called in C# tutorials *(OPTSERVER-2034)*
- Fixed an issue which caused the application to crash when `EnablePortfolioBalanceConstraint()` was called *(OPTSERVER-2033)*
- Fixed an issue in which numeraire was not saved in the XML file *(OPTSERVER-2017)*
- Fixed an issue involving minimum holding threshold *(OPTSERVER-2010)*
- Fixed an issue in which tax harvesting penalty was set incorrectly when tax unit was dollar amount *(OPTSERVER-2009)*
- Improved performance for some reported tax-aware cases *(OPTSERVER-1998)*
- Fixed an issue in which false infeasibility was reported *(OPTSERVER-1997 and OPTSERVER-2018)*
- Fixed an issue which caused the application to crash when the USER environment variable was not set *(OPTSERVER-1975)*
- Fixed an issue in which the “openopt.exe -run“ command did not work with elementwise input files *(OPTSERVER-1963)*
- Fixed an issue in which incorrect infeasibility was reported when the number of constraints was too large for the non-linear solver to handle *(OPTSERVER-1926)*
- Fixed an issue in which a large utility value was reported when using pre-arrange-lot approach *(OPTSERVER-1918)*

Open Optimizer 8.9:

- API support added for Python 3.7.
- Support for MSCI Multi-Asset Class (MAC) model in the ModelsDirect loader API *(OPTSERVER-1728)*
- Support to add currency exposures while loading integrated models in the ModelsDirect loader API *(OPTSERVER-1249)*
- Added API functionality to constraint factor exposures by group *(OPTSERVER-1659)*

- Added various “`Get`” methods to retrieve input data *(OPTSERVER-1485)*
- Added a method to retrieve the information of the solver used for optimization *(OPTSERVER-1453)*
- Added a method to `CSolver` to evaluate risk and risk contributions from a set of assets/factors *(OPTSERVER-1878)*
- Added API functionality to specify multiple linear terms in the objective *(OPTSERVER-282)*
- Added API functionality for extended cherry-picking for pre-arranged-lot approach *(OPTSERVER-1876)*
- Enhanced the default approach for tax-aware optimization cases so that alternative approach is invoked when needed *(OPTSERVER-1846)*
- Enhanced approaches for tax-aware optimization cases with short tax-lot shares *(OPTSERVER-1756)*
- Fixed an issue which caused the application to crash if the same asset had both short and long tax-lots *(OPTSERVER-1915)*
- Fixed an issue in which the optimizer ignored the maximum 0 setting for buy transactions *(OPTSERVER-1914)*
- Fixed an issue in which weights at the tax-lot level did not match asset weight *(OPTSERVER-1906)*
- Fixed an issue in which solution given by pre-arrange approach violated the tax upper bound *(OPTSERVER-1905)*
- Fixed an issue in which incorrect slack value was returned for specific risk constraint *(OPTSERVER-1889)*
- Fixed an issue which caused the application to crash when short rebate term was set for a case without constraints *(OPTSERVER-1879)*
- Fixed an issue in which pre-arrange approach could not handle gain carryover correctly *(OPTSERVER-1858)*
- Fixed an issue in which tax scalar value of 0 returned an infeasible case *(OPTSERVER-1811)*
- Fixed an issue in which relative bounds of global issuer constraints were not set correctly *(OPTSERVER-1791)*
- Fixed an issue with post-optimization adjustments in tax-aware optimizations (*OPTSERVER-1777*)
- Fixed an issue in which the initial portfolio’s weights mismatched the tax-lot weights in the optimal solution of compatible mode *(OPTSERVER-1762)*
- Fixed an issue in which loss carry forwards were not read correctly from XML files *(OPTSERVER-1761)*
- Fixed an issue which caused the application to crash when relative bound was set for issuer constraints *(OPTSERVER-1736)*
- Fixed an issue which caused the application to crash for XML serialization of utility/tax frontier cases *(OPTSERVER-1399)*

End of Support in Open Optimizer 8.9 and above

In Open Optimizer 8.9, support has been **removed** for the following:

- 32-bit applications on Linux platform

Starting with the **next release** of Barra Open Optimizer, there will be **end of support** for the following:

- COM API - deprecated
- Visual Basic applications
- Python 2 API

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 8.9, updated from Barra Open Optimizer 8.8.1:

Class/Enum	C++ API Changes
ERiskType	**New Enum**
ERiskConsQuery	**New members:** eSOFT_LOWERBOUND_RISK, eADDITIVE, and eTRACKING_ERROR
EConsType	**New members:** eTOTAL_RISK_CONS_BY_ASSET, eASSET_RANGE_WITH_LT, and eFACTOR_GROUP_RANGE
ESolverType	**New Enum**
CRiskTerm	**New Class**
CUtility	**New member functions:** AddLinearTerm(), GetAlphaTerm(), GetResidualAlphaTerm(), GetPrimaryRiskTerm(), GetPenaltyTerm(), GetRiskFreeRate(), GetSecondaryRiskTerm(), GetShortRebateTerm(), GetCostOfLeverage(), GetTaxTerm(), GetTranxCostTerm(), GetFixedHoldingCostTerm(), GetJointMarketImpactTerm(), GetUtilityScalar(), GetNumLinearTerms(), and GetLinearTermCoefficients()
CConstraintInfo	**New member functions:** GetLowerBoundMode(), GetUpperBoundMode(), and GetReference()

CLinearConstraints	**Additional parameter for:**
	SetAssetRange()
	New member function:
	AddFactorGroupConstraint()

CRiskConstraints	**New member function:** AddRiskConstraintByAsset(), AddPLFactorConstraint(), AddPLSpecificConstraint(), AddPLTotalConstraint()
CCase	**New member functions:** GetPrimaryRiskModel(), GetSecondaryRiskModel(), GetConstraintAbsLowerBound(), and GetConstraintAbsUpperBound()
CSolver	**New member functions:** GetCaseID(), EvaluateRisk(), and GetSolverType()

Barra Open Optimizer 8.8.1 Release

Introduction

This release of Barra Open Optimizer introduces redesigned tax-aware optimization functionality, enabling more flexibility for portfolio managers considering tax implications during portfolio construction.

Users can now take capital gain taxes into account for optimization involving leverage or threshold constraints. This release also introduces grouping of assets as well as other enhancements for tax-aware optimization.

Previous tax-aware setup for Barra Open Optimizer is also available in this release and is backward compatible.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra PortfolioManager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.8 include the following:

- New tax-aware optimization features:
  - Support for multiple tax rules
  - Tax arbitrage at asset group level
  - Tax harvesting at asset group level
  - Support for trading rules at tax lot level
  - Minimum holding period at asset group level
  - Allow exclusion of some assets from tax consideration
  - Allow tax-free tax lots
  - Allow fractional shares for tax lots
  - Allow short positions for assets and tax lots
  - Tax-aware optimization can now be combined with long/short optimization
  - Tax-aware optimization can now be combined with threshold and cardinality constraints
- A new set of API classes and functions are introduced to support the new tax-aware features in Open Optimizer 8.8.
- The legacy pre-Open Optimizer 8.8 tax-aware optimization APIs are kept intact for backward compatibility.

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

Open Optimizer 8.8.1:

- Support to adjust tolerance for 5/10/40 constraints *(OPTSERVER-1721)*
- Decommissioned the alterxml option in the openopt.exe command line and removed dependency on sharc_xmlproto.dll and bridge_common.dll *(OPTSERVER-1624)*
- Fixed an issue in which optimality test failed for some tax-aware cases with negative initial weights *(OPTSERVER-1756)*
- Fixed an issue in which suboptimal results were returned with wider asset ranges *(OPTSERVER-1751)*
- Fixed an issue in which Internal Error was reported in the application *(OPTSERVER-1725)*
- Fixed an issue in which infeasible slack was reported with feasible case *(OPTSERVER-1724)*
- Fixed an issue in which the Open Optimizer application crashed when the China International (CHX) factor was used *(OPTSERVER-1714)*
- Fixed an issue in which the m_category field of CConstraintInfo object could be uninitialized (definite known value was not required to be set for the declared field) *(OPTSERVER-1697)*
- Fixed an issue in which combination of the new redesigned tax features (introduced in Open Optimizer 8.8) and level paring was blocked *(OPTSERVER-1696)*
- Fixed an issue with the second parameter of `CTaxPortfolio::EvalTotalTax4DirectSolve()` *(OPTSERVER-1694)*

Open Optimizer 8.8:

- API support added for C# on Linux platform.
- API support added for Python 3.5.
- The “CHECK_EFFICIENCY” option added for risk target optimization *(OPTSERVER-1495)*
- A parameter for filtering covariance files added to the `CRiskModel::LoadModelsDirectData()` function *(OPTSERVER-1466)*
- New API functions to retrieve reduced costs of constraint slacks *(OPTSERVER-1493)*
- Fixed an issue in which alack value for general piece-wise linear constraint was higher than expected *(OPTSERVER-1491)*
- Fixed an issue in which nonlinear transaction cost term had no effect for linear programming problems *(OPTSERVER-1484)*
- Fixed an issue in which XML interface failed to handle one-to-many group association for group constraints *(OPTSERVER-1473)*

- Fixed an issue that caused crash for frontier cases without factors.

Package Update

This is the last version of Open Optimizer to support 32-bit Linux applications. Starting from the next version, 32-bit Linux applications will no longer be supported.

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 8.8, updated from Barra Open Optimizer 8.7:

Class/Enum	C++ API Changes
EEvalType	**New member:** eTOTAL_FACTOR_RISK, eTOTAL_SPECIFIC_RISK, eTOTAL_RISK, and eOVERALL_RISK
ETaxLotTradingRule	**New Enum**
ETaxCategory	**New Enum**
ECapitalGainType	**New Enum**
EConType	**New member:** eTAX_FREE_NET, eTAX_FREE_GAIN, and eTAX_FREE_LOSS

CPortfolio	**Parameter changes for:**
	AddtaxLot() and AddWashSaleRec()
	New member function:
	SetAssetExcludedFromTax()

CRiskConstraints	**Additional parameter for the following member functions:** AddFactorConstraint(), AddSpecificConstraint(), AddTotalConstraint(), AddFactorConstraintByGroup(), AddSpecificConstraintByGroup(), and AddTotalConstraintByGroup()
CLinearConstraints	**New member function:** SetNonCashAssetRange()
CConstraints	**New member functions:** GetNewTaxConstraints(), InitNewTaxConstraints()
CCase	**New member functions:** GetNewTax(), InitNewTax()
CRiskModel	**Additional parameter for:** LoadModelsDirectData()
CSlackInfo	**New member functions:** GetUpReducedCost(), GetDownReducedCost()
CWashSaleDetails	**Return type changes for:** GetShares(), GetSoldShares()
CPortfolioOutput	**New member function:** GetNewTaxOutput()
CSolver	**Additional string of CHECK_EFFICIENCY for:** SetOption()
CTaxRule	**New Class**
CNewTax	**New Class**
CNewTaxConstraints	**New Class**

Class/Enum	C++ API Changes
CNewTaxOutput	**New Class**

Barra Open Optimizer 8.7 Release

Introduction

This release of Barra Open Optimizer includes enhancements for risk budgeting, hedge optimization and after-tax optimization.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra Portfolio Manager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.7 include the following:

- Introduces additive definition of risk budgeting that support the following features *(OPTSERVER-1029)*:
  - Upper bound on risk or tracking error from a group of assets
  - Upper bound on specific risk or specific tracking error from a group of assets
  - Upper bound on factor risk or factor tracking error from a group of factors
  - Upper bound on fractional contribution of risk or tracking error from a group of assets
  - Upper bound on fractional contribution of specific risk or specific tracking error from a group of assets
  - Upper bound on fractional contribution of factor risk or factor tracking error from a group of factors
- Risk/return efficient frontiers with leverage constraints *(OPTSERVER-161)*
- Utility/leverage efficient frontier *(OPTSERVER-162)*
- Support of minimum number of assets with tax-aware optimization *(OPTSERVER-1022)*
- Support of risk target with tax-aware optimization *(OPTSERVER-1377)*
- Support of level paring with tax-aware optimization *(OPTSERVER-1394)*

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

- Addition of a complete set of R tutorials *(OPTSERVER-1367)*.
- Addition of an API function for evaluating one of the following values for a given portfolio *(OPTSERVER-1175)*
  - risk or tracking error from a group of assets
  - specific risk or specific tracking error from a group of assets
  - factor risk or factor tracking error from a group of assets or factors
  - fractional contribution of risk or tracking error from a group of assets
  - fractional contribution of specific risk or specific tracking error from a group of assets
  - fractional contribution of factor risk or factor tracking error from a group of assets or factors
- Allow time control for tax-aware optimization (OPTSERVER-1395)
- Addition of a new transaction type in API: eUNIV_ONLY (OPTSERVER-1398)
- Bug fix for utility type in XML interface (OPTSERVER-1403)

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 8.7, updated from Barra Open Optimizer 8.6:

Class/Enum	C++ API Changes
EStatusCode	**New member:** eTARGET_OR_RANGE_UNATTAINABLE_DUETO_NONCONVEXITY
EFrontierType	**New member:** eUTILITY_HEDGE
ERiskContributionType	**New Enum**
ETranxType	**New member:** eUNIV_ONLY
CSolver	**New member function:** EvaluateRiskContribution()
CRiskConstraints	**Additional parameter for the following member functions:** AddFactorConstraint(), AddSpecificConstraint(), AddTotalConstraint(), AddFactorConstraintByGroup(), AddSpecificConstraintByGroup() and AddTotalConstraintByGroup()

Barra Open Optimizer 8.6 Release

Introduction

This release of Barra Open Optimizer adds native support for issuer constraints and introduces branch-and-bound algorithm for optimization cases with cardinality and threshold constraints.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra Portfolio Manager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic feature of Barra Open Optimizer 8.6 includes the following:

- Native support for issuer constraint, allowing the user to set bounds on net total and absolute total holdings of issuers.
- Introduces branch-and-bound algorithm for optimization cases with cardinality and threshold constraints *(OPTSERVER-1253)*

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

Open Optimizer 8.6.1

This release of Barra Open Optimizer contains the following enhancements and bug fixes:

- Added support of closeout option for transaction threshold when running branch-and-bound algorithm *(OPTSERVER-1380)*
- Improved speed of reading from XML files *(OPTSERVER-1324)*
- Fixed an issue that caused crash of API function `CSolver::GetTradeList()` *(OPTSERVER-1381)*
- Fixed an issue in which roundlot constraint failed for an asset with 0 weight *(OPTSERVER-1369)*
- Fixed an issue with transaction costs calculation in the `CAssetTradeListInfo` class for multiple-period optimization and multiple-account optimization *(OPTSERVER-1389)*
- Fixed an issue with transaction cost reporting in the `CAssetTradeListInfo` class *(OPTSERVER-1388)*

Open Optimizer 8.6.0

- Enhanced heuristic algorithms for cardinality and threshold constraints *(OPTSERVER-1331)*.
- Tax lot information is now available in the optimal portfolio *(OPTSERVER-1338)*.
- Functionality to allocate dropped small weights/trades in the optimal portfolio into cash or cash flow or the remaining holdings/trades equally/proportionally *(OPTSERVER-1321)*.

- Addition of missing piecewise linear transaction costs in XML output file for Multiple-Account Optimization / Multiple-Portfolio Optimization (MAO/MPO) cases *(OPTSERVER-1325)*.
- Addition of C# API functions that enables passing covariance data in bulk *(OPTSERVER-1341)*.
- Fixed an issue in which roundlot constraints are violated *(OPTSERVER-1365)*.

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 8.6, updated from Barra Open Optimizer 8.5:

Class/Enum	C++ API Changes
CIssuerConstraints	**New Class** GetIssuerConstraints(), InitIssuerConstraints()
CConstraints	**New member functions**
EIssuerConstraintType	**New Enum**
EStatusCode	**New members:** eINFEASIBLE_DUETO_ISSUER_CONS, eMAYBE_INFEASIBLE_DUETO_ISSUER_CONS
EConsType	**New member:** eISSUER_CONS
CTaxOutput	**New member function:** GetSharesInTaxlots()

Barra Open Optimizer 8.5 Release

Introduction

This major release for Barra Open Optimizer introduces Multiple-Account Optimization (or Multiple-Portfolio Optimization), and offers two approaches with distinctive objectives to solve these optimization problems. The Total-Welfare Maximization approach emphasizes on global utility maximization, while the Nash Equilibrium approach focuses on establishing trade equilibrium among all accounts.

Multiple-Account Optimization allows asset managers to optimize simultaneously a number of accounts and control not only the individual account constraints but also global asset exposure, global trade size and global turnover of all accounts. Further, it takes into consideration the joint market impact transaction costs from pooling trades during the portfolio construction process.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra Portfolio Manager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Analytic Features

Major new analytic feature of Barra Open Optimizer 8.5 includes the following:

- Multiple-Account Optimization

For more information about these features, refer to the Barra Open Optimizer User Guide.

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

- Optimality tolerance multiplier not fully carried to new data structure *(OPTSERVER-1237)*
- Allow users to specify groups in risk constraints *(OPTSERVER-660)*
- Support maximum time limit with Mosek solver *(OPTSERVER-1136)*
- Allow users to use API to retrieve group constraint coefficients *(OPTSERVER-1294)*

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 8.5, updated from Barra Open Optimizer 8.4:

Class/Enum	C++ API Changes
	New const: OPT_DOLLAR_INF
EStatusCode	**New member:** eMAO_HEURISTIC_FAILED
CAsset	**New member function:** GetGroupAttribute()
CCase	**New member functions:** SetTradeUniverse(), GetTradeUniverse()
CRiskConstraints	**New member functions:** AddFactorConstraintByGroup(),AddSpecificConstraintByGroup(), AddTotalConstraintByGroup(), GetGroupName(), GetGroupAttribute()
CSolver	Member function that accepts an additional parameter value: SetOption()
CUtility	**New member functions:** SetJointMarketImpactTerm(), SetUtilityScalar()
CLinearConstraints	**New member function:** SetAssetTradeSize()
CPortfolioOutput	**New member function:** GetAccountID()
CMultiAccountOutput, CCrossAccountConstraints	**New Classes**

Barra Open Optimizer 8.4 Release

Introduction

This major release of Barra Open Optimizer expands the control on threshold and cardinality constraints, the key features used by most portfolio managers. Barra Open Optimizer now allows controlling the amount of penalties over these constraints in addition to a grandfather rule applicable to level paring constraints.

Barra Open Optimizer 8.4 also integrates a new FX converter for the covariance matrix suitable for global investors seeking to optimize in the local currency.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra Portfolio Manager, BarraOne, Barra Aegis, and Barra Open Optimizer.

New Functional Features

Major new functional features of Barra Open Optimizer 8.4 include the following:

- API to get list of asset IDs that belong to a group
- API to retrieve case IDs
- FX converter for the covariance matrix supporting multiple currencies

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.4 include the following:

- Linear penalties on paring constraints
- Grandfather rule for holding-level paring
- Reporting estimate of objective function value gap between reported heuristic portfolio and real optimal portfolio

For more information about these features, refer to the Barra Open Optimizer User Guide.

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

- Optimality tolerance multiplier not fully carried to new data structure *(OPTSERVER-1237)*
- Display error message when there are duplicate constraint IDs *(OPTSERVER-1245)*
- OpenOpt.exe does not reorganize path containing spaces *(OPTSERVER-1262)*
- Performance improvement for setting up factor covariance matrix
- Additional sample codes for the Optimizer-supported languages

The following table lists the C++ API changes in Barra Open Optimizer 8.4, updated from Barra Open Optimizer 8.3:

Class/Enum	C++ API Changes
CPortfolioOutput	**New member function:** GetUpperBoundOnUtility()
CRiskModel	**New member function:** SetNumeraire()
CParingConstraint	**New member functions:** EnableGrandfatherRule(), IsGrandfatherRuleEnabled(), SetPenaltyPerExtraAsset(), SetPenaltyPerExtraTrade(), SetPenaltyPerUnitBelowHoldingThreshold(), SetPenaltyPerUnitBelowTradeThreshold(),GetPenaltyPerExtraAsset(), GetPenaltyPerExtraTrade(), GetPenaltyPerUnitBelowHoldingThreshold(), GetPenaltyPerUnitBelowTradeThreshold()
ETranxType	**New member:** eBUY_NONE_SELL_FROM_UNIV

Barra Open Optimizer 8.3 Release

Introduction

This major release of MSCI's portfolio construction software library integrates an expanded functionality for Multiple-Period Optimization, as well as a comprehensive set of new analytical and functional features that allow users a more granular and precise control over the portfolio construction process.

Barra Open Optimizer 8.3 allows time-dependent benchmarks within a Multiple-Period Optimization. The inclusion of Piecewise Linear Constraints provides a fully flexible constraint definition, enabling new use cases such as liquidity restrictions (reflecting the recently proposed regulations), turnover by group, and total active weights constraints. Additionally, Barra Open Optimizer now connects seamlessly with the Models Direct file format for the Barra Integrated Model.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra PortfolioManager, Barra Aegis, and Barra Open Optimizer.

New Functional Features

Major new functional features of Barra Open Optimizer 8.3 include the following:

- Support for BIMe model in ModelsDirect loader API
- Transaction cost calculator for arbitrary portfolio
- API to compute portfolio beta and evaluate portfolio concentration
- API to verify user input such as eigenvalues of the covariance matrix and numerical data
- APIs to retrieve factor block info from risk model, portfolio and risk model IDs from workspace
- APIs to report buy/sell turnover for the optimal portfolio
- Load asset-level group and attribute information via CSV file
- Factor constraints for secondary risk model
- API to specify scalar for the fixed holding cost term in objective function

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.3 include the following:

- Support for different benchmarks per period in Multiple-Period Optimization
- General piecewise linear constraints
- Turnover by group constraints
- Constraint on total active weights
- Optional cash asset in long/short optimization
- Option to exclude cash in turnover constraint

- Option to include futures in turnover, paring, roundlotting, and hedge constraints
- Support for overlap constraint in after-tax optimization
- Support for nonlinear transaction costs with 5/10/40 or convex risk constraints

For more information about these features, refer to the Barra Open Optimizer User Guide.

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

Open Optimizer 8.3.1

- Free range linear penalty
- Option to specify tolerance for paring constraints
- API support for Python version 3.4
- Fixed an installation issue on 32-bit Windows machines
- Fixed an issue with using asset by asset covariance matrix with parametric problems

Open Optimizer 8.3.0

- Simplified setup and improved performance in populating specific covariance for composite assets
- Improved performance, especially in loading risk model data from ModelsDirect flat files
- Expanded ModelsDirect loader to support monthly exposures + daily covariance
- Risk model type not passed to Optsrvr *(OPTSERVER-1061)*
- The optimizer produces fewer frontier data points than previous version does *(OPTSERVER-1199)*
- A better portfolio than the portfolio returned by the Optimizer exists for a tax case with an overlapping constraint *(OPTSERVER-1205)*
- Clean-up small positions that pass the tolerance test for zero *(OPTSERVER-1217)*

The following table lists the C++ API changes in Barra Open Optimizer 8.3, updated from Barra Open Optimizer 8.2:

Class/Enum	C++ API Changes
CConstraintInfo	**New member function:** SetFreeRangeLinearPenalty()
CAsset	**New member function:** SetCompositePort()
CRiskModel	**New member functions:** GetFactorIDSetInBlock(), GetFactorBlockNameSet(), ComputePortBeta()
CUtility	**New member functions:** SetFixedHoldingCostTerm()

Class/Enum	C++ API Changes
CLinearConstraints	**Updated member function:** SetFactorRange()
CConstraints	**New member functions:** SetTotalActiveWeightConstraint(), AddTotalActiveWeightConstraintByGroup()
CGeneralPWLinearConstraint	**New member functions:** SetConstraint(), AddUpSideSlope(), AddDownSideSlope(), SetStartingPoint(), GetConstraint(), GetUpSideSlopes(), GetDownSideSlopes(), GetUpSideBreakPoints(), GetDownSideBreakPoints(), GetStartingPoint()
CTurnoverConstraints	**New member functions:** AddLongSideConstraintByGroup(), AddNetConstraintByGroup(), AddShortSideConstraintByGroup(), AddBuySideConstraintByGroup(), AddSellSideConstraintByGroup(), SetExcludeCash(), IsCashExcluded()
CConstraints	**New member functions:** AddGeneralPWLinearConstraint(), GetGeneralPWLConstraintIDSet(), GetGeneralPWLinearConstraint(), SetOverlapConstraint(), GetOverlapConstraint(), SetIncludeFutures(), IsFuturesIncluded()
CAssetTradeListInfo	**New member function:** GetAssetID()
CTradeListInfo	**New member functions:** GetNumTrades(), GetTradeInfo(), GetBuySideTurnover(), GetSellSideTurnover()
CSolver	**New member function:** GetTradeList(), InputVerify()
CWorkSpace	**New member functions:** GetPortfolioIDSet(), GetRiskModelIDSet()
EConsType	**New Enumerations** eOVERLAP_CONS
EEvalType	**New Enumerations:** eOVERLAP, eDIVERSIFICATION_RATIO, ePORTFOLIO_CONCENTRATION
EStatusCode	**New Enumerations:** eINFEASIBLE_DUETO_OVERLAP, eMAYBE_INFEASIBLE_DUETO_OVERLAP, eMAYBE_INFEASIBLE_DUETO_GENERAL_PWLI, eMAYBE_INFEASIBLE_DUETO_HEDGE_OR_GENERAL_PWLI

Note: Although these examples are for C++ syntax, they also apply similarly to the JAVA, C#, and COM APIs. For more information about the API items, see the API reference guides listed under the Reference and Tutorial Sample Codes section in the Barra Optimizer User Guide.

Tutorial Changes

We have added a number of new tutorials in the existing C++, Java, C#, Python, and MATLAB tutorials. These new tutorials cover most of the new features introduced in this version.

Barra Open Optimizer 8.2 Release

Introduction

This major release for Barra Open Optimizer showcases a novel mean-variance approach to Multiple-Period Optimization. Multiple-Period Optimization allows portfolio managers and traders to control not only the immediate transaction costs, but also set up the portfolio optimally for future periods and the corresponding alpha and transaction cost forecasts. This release also contains new analytical features to provide a wider set as well as more specific control over portfolio risk, allocation, and diversification.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra PortfolioManager, Barra Aegis, and Barra Open Optimizer.

New Functional Features

Major new functional feature of Barra Open Optimizer 8.2 is the following:

- Added option to disable portfolio balance constraint

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.2 include the following:

- Multiple-Period Optimization
- Portfolio Concentration Limit Constraint
- Soft Lower Bound on Total Risk or Tracking Error for the Primary Risk Model

For more information about these features, refer to the Barra Open Optimizer User Guide.

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

Open Optimizer 8.2.1

- Added option for post-optimization conversion of small positions to cash in optimal portfolio
- Enable trade list in Multiple-Period Optimization output *(OPTSERVER-1142)*
- Composite futures should be excluded from asset/trade paring information *(OPTSERVER-1147)*
- Trade list's nonlinear transaction cost does not take into account asset-level nonlinear TC *(OPTSERVER-1149)*
- Opt Server 8.2.0 efficient Frontier Optimization produces fewer data points than Opt Server 8.1.3 *(OPTSERVER-1151)*
- Risk target case with no PWLI constraints crashes in 8.2 *(OPTSERVER-1152)*
- Internal error on risk target case with net-to-total leverage constraint *(OPTSERVER-1156)*
- SOCP solver not called for risk target case with paring constraint *(OPTSERVER-1167)*

- Constraint hierarchy case, 8.2 results worse than that from 8.1.3 *(OPTSERVER-1168)*

Open Optimizer 8.2.0

- Barra Optimizer now supports the combination of Parametric Optimization with:
  - Cardinality and threshold constraints
  - Soft constraints
- Default asset bound is [-0, 0] when sum of asset weights in initial portfolio is 0 (OPTSERVER-1084)
- When relative asset bound is set and the asset does not exist in the reference portfolio, set reference weight to 0 to evaluate asset bound instead of setting asset bound to 0

The following table lists the C++ API changes in Barra Open Optimizer 8.2, updated from Barra Open Optimizer 8.1:

Class/Enum	C++ API Changes
CCase	**New member function:** SetCashFlowWeight()
CConstraints	**New member functions:** GetCrossPeriodTransactionCostConstraint(), SetCrossPeriodTransactionCostConstraint(), SetPortConcentrationConstraint(), GetPortConcentrationConstraint()
CMultiPeriodOutput	**New Class and member functions:** GetPeriodOutput(), GetCrossPeriodOutput(), GetNumPeriods(), WriteToFile()
CPortConcentrationConstraint	**New Class and member functions:** SetNumTopHoldings(), SetUpperBound(), SetExcludedAssets(), GetNumTopHoldings(), GetUpperBound(), GetExcludedAssets()
CPortfolioOutput	**New member function:** GetPeriodID()
CRiskConstraints	**Updated comments:** CRiskConstraint Class, AddTotalConstraint()
CSolver	**New member functions:** GetMultiPeriodOutput(), AddPeriod(), RemovePeriod(), GetNumPeriods()
CTurnoverConstraints	**New member functions:** SetCrossPeriodNetConstraint()
CWorkSpace	**New member functions:** SwitchPeriod(), GetPeriod()
CLinearConstraints	New member functions: EnablePortfolioBalanceConstraint(), IsPortfolioBalanceConstraintEnabled()
EStatusCode	**Updated comments:** eTARGET_OR_RANGE_UNATTAINABLE_DUETO_PARING
Global	**New constant:** BARRAOPT::ALL_PERIOD

Note: Although these examples are for C++ syntax, they also apply similarly to the JAVA, C#, and COM APIs. For more information about the API items, see the API reference guides listed under the Reference and Tutorial Sample Codes section in the Barra Optimizer User Guide.

Tutorial Changes

We have added a number of new tutorials in the existing C++, Java, C#, Python, and MATLAB tutorials. These new tutorials cover most of the new features introduced in this version.

Barra Open Optimizer 8.1 Release

Introduction

These release notes provide an overview of the new features, enhancements, and defect fixes implemented in Barra Open Optimizer 8.1.

In this release, we continue our focus on functionality that empowers portfolio managers within a natural interface. With this release, we are pleased to announce support for Python, which is quickly becoming a feature-complete statistical programming language for financial modeling and analysis. This release also contains improvements designed to simplify the new user experience, particularly for the MATLAB users. Please see below for the full list of enhancements.

Note: Barra Open Optimizer refers to the stand-alone software library, while Barra Optimizer refers to the common engine available through Barra Portfolio Manager, Barra Aegis, and Barra Open Optimizer.

New Functional Features

Major new functional feature of Barra Open Optimizer 8.1 includes the following:

- Native support for the Python language (The Python precompiled extension module for Open Optimizer is compatible with Python version 2.7)

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.1 include the following:

- Asset penalties (i.e., penalties on deviations away from an asset-weight target)
- Fixed holding costs

For more information about these features, refer to the Barra Open Optimizer User Guide.

Enhancements and Bug Fixes

Major enhancements and bug fixes include the following:

Open Optimizer 8.1.3

- Allow close out setting is ineffective when used with overall minimum level of transaction size for level paring *(OPTSERVER-1076)*
- Results different between compatible mode and normal mode for a paring case with minimum transaction threshold level *(OPTSERVER-1077)*
- IsConvex(..) returns wrong result when paring constraint is initialized without setting any constraint *(OPTSERVER-1078)*
- Low turnover for case with asset paring and soft turnover constraint *(OPTSERVER-1080)*
- Max number of assets constraint not binding with soft leverage constraint *(OPTSERVER-1082)*

Open Optimizer 8.1.2

- In compatible mode, optimization fails for a case that has benchmark in the objective, zero factor risk aversion, and additional covariance term (OPTSERVER-1062)
- CSolver::Evaluate() returns invalid risk numbers when trade universe has more assets than initial portfolio (OPTSERVER-1063)
- Optimal portfolio same as initial portfolio when paring heuristic fails to find a feasible solution due to tight constraints (OPTSERVER-1069)
- Optimizer did not return an optimal portfolio on successful return code *(OPTSERVER-1070)*

Open Optimizer 8.1.1

- Complete set of Python tutorials reflecting a variety of use cases
- Default approach producing optimal portfolio with too many small weights compared to compatible mode approach, resolved by reverting the approach for handling the “Min # of Assets” constraints (OPTSERVER-1057)
- Hedge + roundlotting crashed with big risk aversion, resolved by improving the exception-handling logic (OPTSERVER-1054)
- XML schema not handling multiple cardinality/threshold by group constraints *(OPTSERVER-1056)*

Open Optimizer 8.1

- Complete set of MATLAB tutorials reflecting a variety of use cases
- Installation improvements for MATLAB users
- MATLAB toolbox for complete set of Open Optimizer documentations
- Not enough memory message for asset paring cases with specific covariance matrix having large block size (OPTSERVER-1035)

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 8.1, updated from Barra Open Optimizer 8.0:

Class/Enum	C++ API Changes
CAsset	**New member function:** GetUpSideFixedHoldingCost(), GetDownSideFixedHoldingCost(), GetReferenceWeightForFixedHC(), SetUpSideFixedHoldingCost(), SetDownSideFixedHoldingCost(), SetReferenceWeightForFixedHC()
CSolver	**Enhanced member function:** WriteInputToFile()

Note: Although these examples are for C++ syntax, they also apply similarly to the JAVA, C#, and COM APIs. For more information about the API items, see the API reference guides listed under the “Reference and Tutorial Sample Codes” section in the Barra Open Optimizer User Guide.

Tutorial Changes

We have added a number of new tutorials in the existing C++, Java, C#, Python, and MATLAB tutorials. These new tutorials cover most of the new features introduced in this version.

Barra Open Optimizer 8.0 Release

Note: The numbering system for Barra Open Optimizer releases has changed. The number for the Open Optimizer *release* (for example, 8.0) will now display the same version number as the Barra Optimizer *engine* (for example, 8.0). The Barra Optimizer engine has been developed over 30 years and is contained in every Barra Open Optimizer release. The synchronizing of this numbering system will reflect this relationship.

New Functional Features

Major new functional features of Barra Open Optimizer 8.0 include the following:

- Ability to set maximum time limit for an optimization
- Availability of solver usage information
- APIs to retrieve constraint information

New Analytic Features

Major new analytic features of Barra Open Optimizer 8.0 include the following:

- Threshold and cardinality constraints at the group-level, including an option to close out positions for transaction size threshold constraint.
- Addition of factor constraint, general linear constraint, and transaction cost constraint to Utility-Constraint frontier optimization
- Addition of asset-level nonlinear transaction cost
- Limit on buy turnover or sell turnover
- Calculation of asset's percent contribution to tracking error, factor's percent contribution to active risk, asset beta, and correlation between portfolios.

For more information about these features, refer to the Barra Open Optimizer User Guide.

Enhancements and Bug Fixes

Major enhancements, including bug fixes, in Barra Open Optimizer 8.0 include the following:

- Improved heuristics for 5/10/40 Rules, including branch and bound for small size problems
- Availability of cardinality and threshold constraints in combination with 5/10/40 Rules, Roundlotting, or Parametric optimization
- Risk scalars for flexible risk target optimization
- Satisfy asset bounds for post-optimization roundlotting
- Improved performance of workspace data setup in MATLAB *(OPTSERVER-981)*
- Improved C# API for releasing memory resources *(OPTSERVER-887)*

- Fixed load library exception when running consecutive optimization in the same SAS session *(OPTSERVER-946)*

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 8.0, updated from Barra Open Optimizer 2.1:

Class/Enum	C++ API Changes
CAsset	**New member function:** SetNonLinearTranxCost(), RemoveNonLinearTranxCosts()
CRiskModel	**New member function:** ComputeAssetPCTE(), ComputePortAssetPCTE(), ComputeAssetBeta(), ComputePortAssetBeta(), ComputeFactorPCAR(), ComputePortFactorPCAR(), ComputePortCorrelation()
CParingRange	**New Class:** CParingRange
CParingConstraints	**New member function:** AddAssetTradeParing(), AddAssetTradeParingByGroup(), AddLevelParing(), AddLevelParingByAsset(), AddLevelParingByGroup(), SetAllowCloseOut(), GetAssetTradeParingGroupIDSet(), GetLevelParingGroupIDSet(), GetLevelParingAssetIDSet(), GetAssetTradeParingGroupName(), GetLevelParingGroupName(), GetAssetTradeParingGroupAttribute(), GetLevelParingGroupAttribute(), IsThresholdSoft(), IsThresholdSoftByGroup(), IsThresholdSoftByAsset(), ExistsAssetTradeParingType(), ExistsLevelParingType(), ExistsAssetTradeParingTypeByGroup(), ExistsLevelParingTypeByGroup(), ExistsLevelParingTypeByAsset(), GetAssetTradeParingRange(), GetAssetTradeParingRangeByGroup(), GetThreshold(), GetThresholdByGroup(), GetThresholdByAsset(), AllowCloseOut()
CLinearConstraints	**New member function:** GetConstraintIDSet(), GetConstraintInfo(), GetCoefficients(), GetGroupName(), GetGroupAttribute(), GetTransactionType(), IsCrossoverEnabled()
CHedgeConstraints	**New member function:** GetConstraintIDSet(), GetConstraintInfo(), GetCoefficients(), GetWTLLongSideCoefficients(), GetWTLShortSideCoefficients(), GetGroupName(), GetGroupAttribute(), GetFactorID(), IsLeverageRangeSameAsReference()
CRiskConstraints	**New member function:** GetConstraintIDSet(), GetConstraintInfo(), GetAssetIDSet(), GetFactorIDSet(), Is(), IsRiskParitySet(), IsRiskParityPrimary()
CTurnoverConstraints	**New member function:** SetBuySideConstraint(), SetSellSideConstraint(), GetConstraintIDSet(), GetConstraintInfo(), UseBaseValue()
CConstraintHierarchy	**New member function:** GetConstraintIDSet(), GetPriorityForConstraint(), ExistsCategoryPriority(), GetPriorityForConstraintCategory()
CFrontier	**New member function:** SetFrontierConstraintID(), SetIncludeTransactionCost(), SetFrontierBoundType()
CCase	**New member function:** SetRiskScalar()
CPortfolioOutput	**New member function:** GetAssetTradeParingGroupInfo()
CSolver	**New member function:** SetOption()
EFrontierType	**New member:** eUTILITY_FACTOR, eUTILITY_GENERAL_LINEAR, eUTILITY_TRANSACTION

Class/Enum	C++ API Changes
ELevelParingType	**New member:** eMIN_TRANX_BUY, eMIN_TRANX_SELL
ELeverageType	**New Enumeration:** ELeverageType
ERiskConsQuery	**New Enumeration:** ERiskConsQuery
EConsType	**New Enumeration:** EConsType
EStatusCode	**New member:** eTIME_LIMIT_EXCEEDED, eINFEASIBLE_DUETO_PARING_AND_ROUNDLOTTING, eMAYBE_INFEASIBLE_DUETO_RISKPARITY, eMAYBE_INFEASIBLE_DUETO_PARING_AND_ROUNDLOTTING, eRISK_TARGET_FAILED

Note: Although these examples are for C++ syntax, they also apply similarly to the JAVA, C#, and COM APIs. For more information about the API items, see the API reference guides listed under the “Reference and Tutorial Sample Codes” section in the Barra Open Optimizer User Guide.

Tutorial Changes

We have added a number of new tutorials in the existing C++, Java, C#, and Visual Basic tutorials. These new tutorials cover most of the new features introduced in this version.

Barra Open Optimizer 2.1 Release

New Functional Features

Major new functional features of Barra Open Optimizer 2.1 include the following:

- APIs to consume CSV file format for loading asset-level data and exposures

New Analytic Features

Major new analytic features of Barra Open Optimizer 2.1 include the following:

- Calculation of asset's marginal contribution to tracking error and factor's marginal contribution to active risk.
- Asset-level fixed transaction cost, nonlinear transaction cost, piecewise linear transaction cost, and total transaction cost are now reported in trade list.

Enhancements and Bug Fixes

Major enhancements, including bug fixes, in Barra Open Optimizer 2.1 include the following:

- Thread-safe APIs for use in multi-threaded environment
- Enhanced post-optimization roundlotting by respecting asset bounds
- Improved usability of Models Direct API and easier integration with optimization using executable
- Upgraded Intel MKL library on Windows to take advantage of the feature Conditional Numerical Reproducibility
- Additional minor bug fixes including:
  - Fixed compatibility issue with MATLAB R2013
  - Fixed crash when calling `CPortfolioOutput.GetAssetTradeListInfo()` if `CSolver.WriteInputToFile()` is called first
  - Fixed out-of-memory issue in tax optimization that contains large number of tax lots with trade-off wash sales option

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 2.1, updated from Barra Optimizer 2.0:

Class/Enum	C++ API Changes
CRiskModel	**New member function:** ComputeAssetMCTE(), ComputePortAssetMCTE(), ComputeFactorMCAR(), ComputePortFactorMCAR(), LoadAssetExposures()
CAssetTradeListInfo	**New member function:** GetNonLinearTransactionCost(), GetPiecewiseLinearTransactionCost(), GetTotalTransactionCost()
CWorkSpace	**New member function:** LoadAssetData ()
ERiskModelStatus	**New member:** eINVALID_FACTORS

Note: Although these examples are for C++ syntax, they also apply similarly to the JAVA, C#, and COM APIs. For more information about the API items, see the API reference guides listed under the "Reference and Tutorial Sample Codes" section in the Barra Open Optimizer User Guide.

Tutorial Changes

- Added a XML tutorial set that uses the existing XML format and executable
- Added a number of new tutorials in the existing C++, Java, C#, and Visual Basic tutorials. These new tutorials cover most of the new features introduced in this version

Barra Open Optimizer 2.0 Release Notes

Barra Open Optimizer 2.0 is a major new release of the versatile portfolio construction software library. Adding to our suite of underlying engines, we have a new Second-Order Cone Programming (SOCP) solver, which has significantly improved performance on complex versions of continuous convex risk-constrained problems. It contains a brand new declarative interface for language agnostic management of optimization data and configuration, in forms of XML and Protobuf. It simplifies model loading, with direct consumption of Models Direct files. Barra Open Optimizer 2.0 provides more functionality and a better experience at reduced on boarding and support costs.

New Functional Features

Major new functional features of Barra Open Optimizer 2.0 include the following:

- New set of interfaces for serializing/de-serializing optimizer input/output in XML and Protobuf formats, and available in C#, Java, and MATLAB.
- Added native C# API and improved C# application's performance (compared to those via COM API).
- Added a command-line executable for loading Models Direct files, running optimization, and converting different optimizer file formats

New Analytic Features

Major new analytic features of Barra Open Optimizer 2.0 include the following:

- Risk parity constraints
- Weighted total leverage constraints
- Group total leverage constraints
- Factor total leverage constraints
- KKT (Karush–Kuhn–Tucker conditions) information in output
- Performance through a Second-Order Cone Programming (SOCP) solver

The introduction of SOCP produces comparable solutions, but at speeds much faster than the earlier Barra Optimizer versions. SOCP also equips Barra Optimizer to possibly find solutions for previously infeasible problems with complex risk constraints.

The SOCP solver will be triggered when any of the following conditions hold:

- Has risk parity
- Has convex risk constraints
- Has additional covariance terms in the objective
- And none of the following conditions hold:
  - Optimization:
    - Risk-Return Frontier

        - Utility-Turnover Frontier
        - Risk Target
        - Return Target
        - After-Tax Risk/Return Tradeoff
    - Maximization of Share Ratio
    - Maximization of Information Ratio
    - Cardinality or Threshold Constraints
    - Total Level Constraints in Long-Short Optimization cases
    - 5/10/40 rule
    - Optimal roundlotting
    - Nonlinear transaction costs or transaction costs are fixed
    - Residual alpha penalty
    - Soft bounds
    - Constraint hierarchy

Enhancements and Bug Fixes

Major enhancements, including bug fixes, in Barra Open Optimizer 2.0 include the following:

- Added a Second-Order Cone solver into our collection of optimization solvers.
- Added capability to enable the Barra Open Optimizer to automatically select a proper solver based on type of optimization problems.
- Added an API function to allow the user loading risk model data from Models Direct files
- Improved performance for some optimization cases.
- Additional minor bug fixes including:
    - Fixed a rare crash in after tax optimization cases with a trade-off wash sale rule.
    - Fixed an unusual reporting issue in the long-term trade lost computation when using an after-tax optimization with future-type assets.
    - Improved ability to locate feasible solutions in highly constrained problems with cardinality or threshold constraints.

API Changes

The following table lists the C++ API changes in Barra Open Optimizer 2.0, updated from Barra Optimizer 1.3:

Class/Enum	C++ API Changes
CAsset	**New member functions:** IsExcludedFromRiskParity(), SetExcludeFromRiskParity(),SetType()
CRiskModel	**New member function:** LoadModelsDirectData()
CHedgeConstraints	**New member functions:** AddWeightedTotalLeverageConstraint(), AddTotalLeverageGroupConstraint(), AddTotalLeverageFactorConstraint()
CRiskConstraints	**New member function:** SetRiskParity()
CCase	**New member function:** GetConstraintCoefficients()
CSlackInfo	**New member functions:** GetKKTTerm(), GetPenaltyKKTTerm()
CPortfolioOutput	**New member function:** GetPrimaryRiskModelKKTTerm(), GetSecondaryRiskModelKKTTerm(), GetResidualAlphaKKTTerm(), GetTransactioncostKKTTerm()
CUtility	**New member function:** AddCovarianceTerm() **Changed member function:** Removed the second paramter of SetPenaltyTerm()
CWorkSpace	**Enhanced member function:** Serialize()
ERiskModelStatus	**New Enum**
EFileFormat	**New Enum**
EStatusCode	**New member:** eMAYBE_INFEASIBLE_DUETO_RISKPARITY

Note: Although these examples are for C++ syntax, they also apply similarly to the JAVA, C# and COM APIs. For more information about the API items, see the API reference guides listed under the "Reference and Tutorial Sample Codes" section in the Barra Open Optimizer User Guide.

Tutorial Changes

- Added a C# tutorial set that uses the newly added C# native API
- Added a C# tutorial set that uses the newly added C#/XML API
- Added a Java tutorial set that uses the newly added Java/XML API
- Added a MATLAB sample that uses the newly added Java/XML API
- Added a number of new tutorials in the existing C++, Java, C#, and Visual Basic tutorials. These new tutorials cover most of the new features introduced in this version

Barra Open Optimizer 1.3 Release Notes

New Features

Major new features of Barra Optimizer 1.3 include the following:

- Additional covariance terms for the objective function
- Post-optimization roundlotting
- Additional statistics for a given portfolio, including the optimal/initial portfolio
- Indication of the optimization problem type as convex or non-convex
- Indication of the output portfolio as heuristic or optimal
- Crossover option
- Trade list information in output
- Specify short costs as single attribute
- Factor grouping information
- KKT (Karush–Kuhn–Tucker conditions) information in output

Decommissioned Feature

The following feature from Barra Optimizer 1.2.1.2 has been decommissioned in Barra Optimizer 1.3:

- Lower bounds on risk constraints are no longer supported. For more information, refer to Section 6.1 of the Analytics Guide.

Enhancements and Bug Fixes

- Improved our heuristics for tax harvesting cases.
- Fixed crashing for certain optimization cases with nothing in the objective function.
- Fixed the problem of the nonlinear solver not taking into account the transaction cost scalar that is not 1.
- Fixed the problem of incorrectly claiming some roundlotting cases as infeasible

Other Changes

- Added 64-bit Version for Window Platform.
- Set default transaction cost multiplier as 0 instead of 1.

API Changes

The following table lists the C++ API changes in Barra Optimizer 1.3, updated from Barra Optimizer 1.2.1:

Class/Enum	C++ API Changes
CAsset	**New member function:** SetNetShortCost(),GetNetShortCost()
CCase	**New member function:** IsConvex()
CLinearConstraints	**New member function:** EnableCrossovers()
CPortfolioOutput	**New member function:** GetRoundlottedPortfolio(), IsHeuristic(), GetAssetTradeListInfo()
CRiskModel	**New member function:** AddFactorBlock()
CSlackInfo	**New member function:** IsActive(), GetRefPoint(), IsUp()
CSolver	**New member function:** Evaluate()
CUtility	**New member function:** AddCovarianceTerm()
CAssetTradeListInfo	**New Class**
ECovTermType	**New Enum**
ETradeType	**New Enum**
EEvalType	**New Enum**
EStatusCode	**New Enum member:** eMAYBE_INFEASIBLE_DUETO_51040

Note: Although these examples are for C++ syntax, they also apply to the JAVA and COM APIs. For more information about the API items, see the API reference guides listed under the “Reference and Tutorial Sample Codes” section in the Barra Open Optimizer User Guide.

Tutorial Changes

There are a number of new tutorials in the Barra Optimizer 1.3 package in C++, Java, C#, and Visual Basic. These new tutorials cover most of the new features introduced in this version. A Visual Studio 2010 project file is provided for the C++ tutorials.

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