

FINCAD Analytics in Charles River IMS



Combined with Charles River IMS portfolio management, risk and attribution capabilities, FINCAD provides clients with the necessary analytics to support and manage exposures, calculate fair values, and size trades appropriately.

Leveraging Charles River's single data model, natively calculated FINCAD analytics are compatible with analytics across all asset types, enabling accurate benchmark comparisons. This eliminates the need for external index-provider analytics systems. FINCAD analytics available within Charles River IMS include:

Analytic	Native Calculations
Trade-level	Price, yield, accrued interest, projected cash flows, factor, spread-to-benchmark
Sensitivities	Duration, modified duration, convexity, rate DV01, inflation DV01
Derivative-related	Option greeks, credit DV01, per-swap rate
Spreads and KRD	Valuation, Option Adjusted Spread (OAS), I-spread, Z-spread, spread duration, spread convexity, key rate durations

Consistent and Accurate Asset Valuation

FINCAD's analytics engine and industry-standard computational models helps ensure accurate, real-time valuations across fixed income and derivatives instruments globally. Firms can store and compare multiple reference data and pricing sources in Charles River IMS to help meet the valuation requirements of their investment process and asset mix.

Seamless Curve Construction

Accurate curve construction is key to helping traders and portfolio managers understand exposures, risk and performance. Charles River IMS leverages FINCAD to enable streamlined curve construction workflows directly from Charles River's portfolio manager workbench and trade blotter. Treasury, Swap and constructed curve-based analytics are available for:

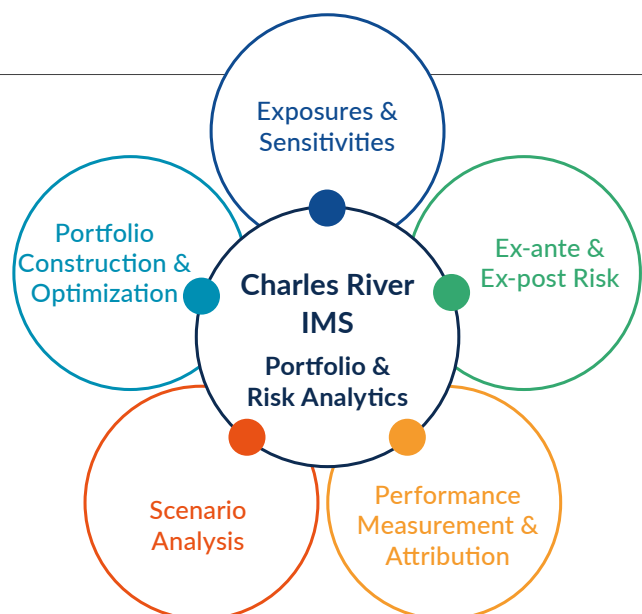
- Constructed Swap Curves in 15 different currencies
- Sovereign Bond Curves from 32 separate nations

Extensive coverage across geographies and instruments helps investment firms, pensions, insurers and wealth managers support the most complex institutional portfolios, products and strategies. FINCAD covers exchange traded and OTC derivatives across 80+ geographies*:

Asset Class	Instrument Coverage
Fixed Income	<ul style="list-style-type: none"> • Fixed Rate, Variable Rate, Zero Coupon and Discount Bonds • Interest at Maturity, Stepped Rate, Payment in Kind, and Callable Bonds • Inflation-adjusted and Fixed-To-Float Bonds • Bank Loans, Repos and Mortgage-backed Securities • Municipal Bonds
Interest Rate Derivatives	<ul style="list-style-type: none"> • Interest Rate Swaps • Cross-currency and Basis Swaps • Interest Rate Caps / Floors • Forward Rate Agreements • IRS Swaptions • Bond Futures • Interest Rate Futures
Credit Derivatives	<ul style="list-style-type: none"> • Credit Default Swaps • CDS Swaptions • Asset Swaps • Credit Linked Notes • Total Return Swaps
Equity Derivatives	<ul style="list-style-type: none"> • Equity Options • Equity Futures • Total Return Equity Swaps • Vol/Var Swaps
FX Derivatives	<ul style="list-style-type: none"> • Currency Options • Futures and Forwards
Commodity	<ul style="list-style-type: none"> • Futures • Index and Excess Return Swaps
Inflation	<ul style="list-style-type: none"> • Inflation Swaps

Benefits of FINCAD in Charles River IMS

- Single desktop experience for risk valuation, pricing and analysis
- Extensive global derivatives & fixed income coverage
- Consistent analytics and workflows from portfolio construction to trading



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*As of May 2020

ABOUT FINCAD

FINCAD is the leading provider of valuation and risk analytics for derivatives and fixed income markets. An industry standard since 1990, FINCAD's advanced analytics, flexible solutions and patented technology allow you to model and analyze any curve, any instrument, any way you want. With FINCAD, global asset managers, hedge funds, insurance companies, pension funds, banks and auditors can seize new opportunities, anticipate market change and make informed decisions with confidence. For more information, visit fincad.com.

ABOUT CHARLES RIVER, A STATE STREET COMPANY

Investment firms, asset owners, wealth managers, hedge funds and insurers in more than 30 countries rely on Charles River's front and middle office investment management platform to manage more than US\$29 Trillion in assets. Together with State Street's middle and back office capabilities, Charles River's cloud-deployed software technology forms the foundation of State Street AlphaSM. The Charles River Investment Management Solution (Charles River IMS) is designed to automate and simplify the institutional investment process across asset classes, from portfolio management and risk analytics through trading and post-trade settlement, with integrated compliance and managed data throughout. Charles River's growing partner ecosystem enables clients to seamlessly access external data and analytics, applications and liquidity venues that support the unique demands of their product and asset class mix. Headquartered in Burlington, Massachusetts, we serve clients globally with more than 1,000 employees in 11 regional offices. For more information, please visit www.crd.com. (Statistics as of as of April 2020)

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State Street Corporation (NYSE: STT) is one of the world's leading providers of financial services to institutional investors including investment servicing, investment management and investment research and trading. With \$31.86 trillion in assets under custody and/or administration and \$2.69 trillion* in assets under management as of March 31, 2020, State Street operates globally in more than 100 geographic markets and employs approximately 39,000 worldwide. For more information, visit State Street's website at www.statestreet.com.

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*Assets under management as of March 31, 2020 includes approximately \$50 billion of assets with respect to which State Street Global Advisors Funds Distributors, LLC (SSGA FD) serves as marketing agent; SSGA FD and State Street Global Advisors are affiliated.

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