CreditAnalytics Product and Functional Coverage

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Product Coverage

<table>
<tr><th>Base Type</th><th>Variants and Details</th></tr>
<tr><td>Bonds</td><td>

Bullet
Fixed Coupon
Floating Rate
Capped Coupon floor and ceiling
Amortizing Bonds
Bonds with sinking funds
Deterministic coupon and notional schedules
Schedules specified as pay down or outstanding
Accreting and capitalizing bonds
Step up and Step down coupon schedules
Bonds with embedded schedules
European Call or Put Schedules
Bermudan/American Call/Put Schedules
Concurrent and overlapping Calls and Puts
Fix to float on exercise
Differing coupon, redemption, and trade/quote currencies
Custom bonds
Custom coupon and notional schedules (pay down or outstanding)
Custom coupon period generation functionality
Custom quoting/settlement parameters
Custom rates/credit/currency/fixing parameters
Custom embedded option schedules (concurrent put/call, fix to float, American exercise dates etc)
TSY marked bonds – linkable to more than one treasury benchmark

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Credit Default Swap (CDS)	• Varying contract details
	    o Vanilla fixed coupon CDS
	    o Amortizing notional CDS
	    o Fixed recovery CDS
	• Standardized CDS varieties
	    o ISDA style, with variants for NA SNAC, EU standard CDS, EM’s STEM contract
	    o Standard 100 bps/500 bps with upfront quotes
	    o Support for old style pure running CDS
	• Custom CDS
	    o Notional/recovery schedule
	    o Highly flexible period generation and settlement rules

Credit Default Swap Index (CDX)	• Supports all the standard CDX indices traded, including CDX NA variants (on-the run and off the runs varieties), and iTRAXX EUR variants
	• Custom CDS baskets
	    o Customizable components and their weights
	    o Customizable outstanding notional and coupon schedules, as well as component amortization schedules

Bond Basket	• Support for the standard iShares ETF
	• Support for the creation of customizable bond baskets
	    o Customizable components and their weights
	    o Customizable outstanding notional and coupon schedules, as well as component amortization schedules

Fixed Income Analytics Coverage

Category	Details
Holiday	▪ Support for holiday schedules of 126 jurisdictions
Day Count Conventions	▪ Supports 30+ day count conventions – all the main DCC
Date Adjustment and Roll	▪ Supports 7 different date adjustment/date roll conventions
Date generation	▪ Generation of the standard IR product schedules (Cash/EDF/IRS/treasury) and credit products (CDS/CDX/bond) in accordance with typical generation rules (eg., IMM) ▪ Forward/backward generation with cutomizable period pay/accrual/reset dates

Calculated Analytical Measures Coverage

Product	Measure
Bond	▪ Accrued ▪ Accrued 01 ▪ Calculation Time ▪ Clean Price ▪ Convexity ▪ Coupon PV ▪ Duration ▪ Expected Recovery ▪ Fair Clean DV01 ▪ Fair Clean Price ▪ Fair Clean Price Default Free ▪ Fair Clean PV ▪ Fair Clean PV Default Free ▪ Fair Credit Yield Basis ▪ Fair Dirty DV01 ▪ Fair Dirty Price ▪ Fair Dirty Price Default Free ▪ Fair Dirty PV ▪ Fair Dirty PV Default Free ▪ Fair G Spread ▪ Fair I Spread ▪ Fair Notional PV ▪ Fair Par Coupon ▪ Fair Price ▪ Fair PV ▪ Fair Spread over Treasury benchmark ▪ Fair Upfront

	▪ Fair Yield To Maturity ▪ Fair Yield To Maturity Default Free ▪ Fair Yield To Maturity Default Free Duration ▪ Fair Yield To Worst ▪ Fair Yield To Worst Date ▪ Fair Yield To Worst Default Free ▪ Fair Yield To Worst Default Free Convexity ▪ Fair Yield To Worst Default Free Date ▪ Fair Yield To Worst Default Free Duration ▪ Fair Yield To Worst Default Free Factor ▪ Fair Yield To Worst Convexity ▪ Fair Yield To Worst Duration ▪ Fair Yield To Worst Factor ▪ Fair Z Spread ▪ First Coupon Index ▪ First Index Rate ▪ Market Credit Yield Basis ▪ Market Price ▪ Market Yield to Maturity ▪ Market Yield To Maturity Convexity ▪ Market Yield To Maturity Duration ▪ Market Yield To Worst ▪ Market Yield To Worst Convexity ▪ Market Yield To Worst Date ▪ Market Yield To Worst Duration ▪ Market Yield To Worst Factor ▪ Market I Spread ▪ Market G Spread ▪ Market Z Spread ▪ Principal PV ▪ Recovery PV

Bond Basket	▪ Accrued ▪ Accrued 01 ▪ Calculation Time ▪ Clean Price ▪ Convexity ▪ Coupon PV ▪ Duration ▪ Expected Recovery ▪ Fair Clean DV01 ▪ Fair Clean Price ▪ Fair Clean Price Default Free ▪ Fair Clean PV ▪ Fair Clean PV Default Free ▪ Fair Credit Yield Basis ▪ Fair Dirty DV01 ▪ Fair Dirty Price ▪ Fair Dirty Price Default Free ▪ Fair Dirty PV ▪ Fair Dirty PV Default Free ▪ Fair G Spread ▪ Fair I Spread ▪ Fair Notional PV ▪ Fair Par Coupon ▪ Fair Price ▪ Fair PV ▪ Fair Spread over Treasury benchmark ▪ Fair Upfront ▪ Fair Yield To Maturity ▪ Fair Yield To Maturity Default Free ▪ Fair Yield To Maturity Default Free Duration ▪ Fair Yield To Worst

	▪ Fair Yield To Worst Date ▪ Fair Yield To Worst Default Free ▪ Fair Yield To Worst Default Free Convexity ▪ Fair Yield To Worst Default Free Date ▪ Fair Yield To Worst Default Free Duration ▪ Fair Yield To Worst Default Free Factor ▪ Fair Yield To Worst Convexity ▪ Fair Yield To Worst Duration ▪ Fair Yield To Worst Factor ▪ Fair Z Spread ▪ First Coupon Index ▪ First Index Rate ▪ Market Credit Yield Basis ▪ Market Price ▪ Market Yield to Maturity ▪ Market Yield To Maturity Convexity ▪ Market Yield To Maturity Duration ▪ Market Yield To Worst ▪ Market Yield To Worst Convexity ▪ Market Yield To Worst Date ▪ Market Yield To Worst Duration ▪ Market Yield To Worst Factor ▪ Market I Spread ▪ Market G Spread ▪ Market Z Spread ▪ Principal PV ▪ Recovery PV
CDS	▪ Accrued ▪ Accrued 01 ▪ Calculation Time ▪ Clean DV01

	▪ Clean Price ▪ Clean PV ▪ Dirty PV ▪ DV01 ▪ Expected Loss ▪ Fair Premium ▪ Loss PV ▪ Premium PV ▪ Price ▪ PV ▪ Upfront
CDX	▪ Accrued ▪ Accrued 01 ▪ Calculation Time ▪ Clean DV01 ▪ Clean Price ▪ Clean PV ▪ Dirty PV ▪ DV01 ▪ Expected Loss ▪ Fair Premium ▪ Loss PV ▪ Premium PV ▪ Price ▪ PV ▪ Upfront

Calculated Risk Measures Coverage

Product	Measure
Bond	▪ Bond G Spread PV 01 ▪ Bond I Spread PV 01 ▪ Bond Price Bumped PV 01 ▪ Bond Yield Bumped PV 01 ▪ Bond TSY Spread PV 01 ▪ Bond Z Spread PV 01 ▪ Parallel Bumped Credit PV 01 ▪ Parallel Bumped Credit PV Gamma ▪ Parallel Bumped IR PV 01 ▪ Parallel Bumped IR PV Gamma ▪ Parallel Bumped Recovery Rate PV 01 ▪ Parallel Bumped RR PV Gamma ▪ Parallel 10% Credit Spread Widening PV Change ▪ Tenor Bumped Credit PV 01 ▪ Tenor Bumped Credit PV Gamma (Same Node) ▪ Tenor Bumped IR PV 01 ▪ Tenor Bumped IR PV Gamma (Same Node) ▪ Tenor Bumped Recovery Rate PV 01 ▪ Tenor Bumped RR PV Gamma (Same Node) ▪ FX Spot PV 01 (as applicable)
Bond Basket	▪ Flat G Spread PV 01 ▪ Flat I Spread PV 01 ▪ Flat Price Bumped PV 01 ▪ Flat Yield Bumped PV 01 ▪ Flat TSY Spread PV 01 ▪ Flat Z Spread PV 01 ▪ Flat Parallel Bumped Credit PV 01

	▪ Flat Parallel Bumped Credit PV Gamma ▪ Flat Parallel Bumped IR PV 01 ▪ Flat Parallel Bumped IR PV Gamma ▪ Flat Parallel Bumped Recovery Rate PV 01 ▪ Flat Parallel Bumped RR PV Gamma ▪ Flat Parallel 10% Credit Spread Widening PV Change ▪ Component Bond G Spread PV 01 ▪ Component Bond I Spread PV 01 ▪ Component Bond Price Bumped PV 01 ▪ Component Bond Yield Bumped PV 01 ▪ Component Bond TSY Spread PV 01 ▪ Component Bond Z Spread PV 01 ▪ Component Parallel Bumped Credit PV 01 ▪ Component Parallel Bumped Credit PV Gamma ▪ Component Parallel Bumped IR PV 01 ▪ Component Parallel Bumped IR PV Gamma ▪ Component Parallel Bumped Recovery Rate PV 01 ▪ Component Parallel Bumped RR PV Gamma ▪ Component Parallel 10% Credit Spread Widen ▪ Flat Tenor Bumped Credit PV 01 ▪ Flat Tenor Bumped Credit PV Gamma (Same Node) ▪ Flat Tenor Bumped IR PV 01 ▪ Flat Tenor Bumped IR PV Gamma (Same Node) ▪ Flat Tenor Bumped Recovery Rate PV 01 ▪ Flat Tenor Bumped RR PV Gamma (Same Node) ▪ Component Tenor Bumped Credit PV 01 ▪ Component Tenor Bumped Credit PV Gamma (Same Node) ▪ Component Tenor Bumped IR PV 01 ▪ Component Tenor Bumped IR PV Gamma (Same Node) ▪ Component Tenor Bumped Recovery Rate PV 01 ▪ Component Tenor Bumped RR PV Gamma (Same Node)

	▪ FX Spot PV 01 (as applicable)
CDS	▪ Parallel Bumped Credit Fair Premium 01 ▪ Parallel Bumped Credit Fair Premium Gamma ▪ Parallel Bumped Credit PV 01 ▪ Parallel Bumped Credit PV Gamma ▪ Parallel Bumped Credit Upfront 01 ▪ Parallel Bumped Credit Upfront Gamma ▪ Parallel Bumped IR Fair Premium 01 ▪ Parallel Bumped IR Fair Premium Gamma ▪ Parallel Bumped IR PV 01 ▪ Parallel Bumped IR PV Gamma ▪ Parallel Bumped IR Upfront 01 ▪ Parallel Bumped IR Upfront Gamma ▪ Parallel Bumped Recovery Rate Fair Premium 01 ▪ Parallel Bumped Recovery Rate Fair Premium Gamma ▪ Parallel Bumped Recovery Rate PV 01 ▪ Parallel Bumped Recovery Rate PV Gamma ▪ Parallel Bumped Recovery Rate Upfront 01 ▪ Parallel Bumped Recovery Rate Upfront Gamma ▪ Parallel 10% Credit Spread Widening PV Change ▪ Tenor Bumped Credit Fair Premium 01 ▪ Tenor Bumped Credit Fair Premium Gamma (Same Node) ▪ Tenor Bumped Credit PV 01 ▪ Tenor Bumped Credit PV Gamma (Same Node) ▪ Tenor Bumped Credit Upfront 01 ▪ Tenor Bumped Credit Upfront Gamma (Same Node) ▪ Tenor Bumped IR Fair Premium 01 ▪ Tenor Bumped IR Fair Premium Gamma (Same Node) ▪ Tenor Bumped IR PV 01 ▪ Tenor Bumped IR PV Gamma (Same Node) ▪ Tenor Bumped IR Upfront 01

	▪ Tenor Bumped IR Upfront Gamma (Same Node) ▪ Tenor Bumped Recovery Rate Fair Premium 01 ▪ Tenor Bumped Recovery Rate Fair Premium Gamma (Same Node) ▪ Tenor Bumped Recovery Rate PV 01 ▪ Tenor Bumped Recovery Rate PV Gamma (Same Node) ▪ Tenor Bumped Recovery Rate Upfront 01 ▪ Tenor Bumped Recovery Rate Upfront Gamma (Same Node)
CDX	▪ Flat Parallel Bumped Credit Fair Premium 01 ▪ Flat Parallel Bumped Credit Fair Premium Gamma ▪ Flat Parallel Bumped Credit PV 01 ▪ Flat Parallel Bumped Credit PV Gamma ▪ Flat Parallel Bumped Credit Upfront 01 ▪ Flat Parallel Bumped Credit Upfront Gamma ▪ Flat Parallel Bumped IR Fair Premium 01 ▪ Flat Parallel Bumped IR Fair Premium Gamma ▪ Flat Parallel Bumped IR PV 01 ▪ Flat Parallel Bumped IR PV Gamma ▪ Flat Parallel Bumped IR Upfront 01 ▪ Flat Parallel Bumped IR Upfront Gamma ▪ Flat Parallel Bumped Recovery Rate Fair Premium 01 ▪ Flat Parallel Bumped Recovery Rate Fair Premium Gamma ▪ Flat Parallel Bumped Recovery Rate PV 01 ▪ Flat Parallel Bumped Recovery Rate PV Gamma ▪ Flat Parallel Bumped Recovery Rate Upfront 01 ▪ Flat Parallel Bumped Recovery Rate Upfront Gamma ▪ Flat Parallel 10% Credit Spread Widening PV Change ▪ Component Parallel Bumped Credit Fair Premium 01 ▪ Component Parallel Bumped Credit Fair Premium Gamma ▪ Component Parallel Bumped Credit PV 01 ▪ Component Parallel Bumped Credit PV Gamma ▪ Component Parallel Bumped Credit Upfront 01

	▪ Component Parallel Bumped Credit Upfront Gamma ▪ Component Parallel Bumped IR Fair Premium 01 ▪ Component Parallel Bumped IR Fair Premium Gamma ▪ Component Parallel Bumped IR PV 01 ▪ Component Parallel Bumped IR PV Gamma ▪ Component Parallel Bumped IR Upfront 01 ▪ Component Parallel Bumped IR Upfront Gamma ▪ Component Parallel Bumped Recovery Rate Fair Premium 01 ▪ Component Parallel Bumped Recovery Rate Fair Premium Gamma ▪ Component Parallel Bumped Recovery Rate PV 01 ▪ Component Parallel Bumped Recovery Rate PV Gamma ▪ Component Parallel Bumped Recovery Rate Upfront 01 ▪ Component Parallel Bumped Recovery Rate Upfront Gamma ▪ Component Parallel 10% Credit Spread Widening PV Change ▪ Flat Tenor Bumped Credit Fair Premium 01 ▪ Flat Tenor Bumped Credit Fair Premium Gamma (Same Node) ▪ Flat Tenor Bumped Credit PV 01 ▪ Flat Tenor Bumped Credit PV Gamma (Same Node) ▪ Flat Tenor Bumped Credit Upfront 01 ▪ Flat Tenor Bumped Credit Upfront Gamma (Same Node) ▪ Flat Tenor Bumped IR Fair Premium 01 ▪ Flat Tenor Bumped IR Fair Premium Gamma (Same Node) ▪ Flat Tenor Bumped IR PV 01 ▪ Flat Tenor Bumped IR PV Gamma (Same Node) ▪ Flat Tenor Bumped IR Upfront 01 ▪ Flat Tenor Bumped IR Upfront Gamma (Same Node) ▪ Flat Tenor Bumped Recovery Rate Fair Premium 01 ▪ Flat Tenor Bumped Recovery Rate Fair Premium Gamma (Same Node) ▪ Flat Tenor Bumped Recovery Rate PV 01 ▪ Flat Tenor Bumped Recovery Rate PV Gamma (Same Node) ▪ Flat Tenor Bumped Recovery Rate Upfront 01

	▪ Flat Tenor Bumped Recovery Rate Upfront Gamma (Same Node) ▪ Component Tenor Bumped Credit Fair Premium 01 ▪ Component Tenor Bumped Credit Fair Premium Gamma (Same Node) ▪ Component Tenor Bumped Credit PV 01 ▪ Component Tenor Bumped Credit PV Gamma (Same Node) ▪ Component Tenor Bumped Credit Upfront 01 ▪ Component Tenor Bumped Credit Upfront Gamma (Same Node) ▪ Component Tenor Bumped IR Fair Premium 01 ▪ Component Tenor Bumped IR Fair Premium Gamma (Same Node) ▪ Component Tenor Bumped IR PV 01 ▪ Component Tenor Bumped IR PV Gamma (Same Node) ▪ Component Tenor Bumped IR Upfront 01 ▪ Component Tenor Bumped IR Upfront Gamma (Same Node) ▪ Component Tenor Bumped Recovery Rate Fair Premium 01 ▪ Component Tenor Bumped Recovery Rate Fair Premium Gamma (Same Node) ▪ Component Tenor Bumped Recovery Rate PV 01 ▪ Component Tenor Bumped Recovery Rate PV Gamma (Same Node) ▪ Component Tenor Bumped Recovery Rate Upfront 01 ▪ Component Tenor Bumped Recovery Rate Upfront Gamma (Same Node)