Methods, Models and Instruments

METHODS

Analytic

Binomial & Trinomial trees

Fast Fourier transform methods

Lattice

Matrix methods (eigenvalues, Cholesky decomposition, inversion, etc.)

Minimization algorithms (Levenberg-Marquardt, Downhill Simplex)

Monte Carlo simulation (including Longstaff-Schwarz for early exercise)

Numerical integration (Gaussian quadrature, Simpson's method, etc)

Partial differential equations (PDEs)

PDE

Regression (linear, polynomial)

Recursion methods (for synthetic CDOs)

Root-finding algorithms (Bisection, Newton-Raphson, Brent)

Tree

MODELS

General

Black Scholes

Cox Rubenstein

Heston

SABR

Interest Rates/Fixed Income

Black model

Black-Karasinski Deterministic model (1F/2F)

Cheyette Local Volatility Model

Cheyette LSV Model

Cox-Ingersoll-Ross Model (1F/2F)

Classic BGM Deterministic (zero volatility) model

Forward Market Model (FMM)

Gaussian

Hull-White (1F/2F/3F)

Libor Market Model

Longstaff-Schwartz method

Multi-currency models Stochastic Volatility LMM with HW/BK models for IR components and BS/Heston model for FX

N-currency LMM

Shifted BK (Single/Two Factor)

Shifted LMM

Skew BK

Stochastic Volatility LMM

Foreign Exchange

Bates stochastic volatility jump diffusion model

Black-Scholes model

Continuity corrections for FX barriers Deterministic model

Cross Currency multi factor Hybrid (IR/FX)

DLV

Dupire local volatility model, also with advanced fit of local volatility surface

FR Heston

Garman Kohlhagen

Heston stochastic volatility model with constant and time-dependent coefficients

Local stochastic volatility model

Multi-factor BS basket model

SABR model

Vanna-Volga

Credit

Advanced-Factor Models of Credit Baskets

Asymptotic Saddlepoint Methods

Black–Karasinski Model

Cox-Ingersoll-Ross Model Cox (1F/2F)

CRB Models

Credit Spread Var For Credit Portfolios

Credit Transition Model

Default Var and Expected Shortfall for Credit Portfolios

Deterministic Model

Diffusion model (Liu and Jackel)

Direct Grid Convolution

Dynamic Credit Model (Top-Down Approach)

Dynamic Credit Model for Pricing/Hedging Heterogeneous CDOs (Bottom-Up Approach)

Fourier/Laplace Transform

Gaussian Copula Model with Optional Correlated/ Stochastic Recovery

Hull-White (Single/Multi Factor)

Modified Black

NIG Copula Model

Recursion method (CDOs)

Student-T Copula Model

Equities

Anderson-Buffum model for liquid convertible bonds Convertible bonds

Bates Stochastic Volatility Model

Black-Scholes Model

Continuous or discrete dividends

Deterministic Model

DLV

Dupire Model

Equity Convertible

Fast low dimensional PDE methods for Asian and Lookback options

FR Heston

Heston Stochastic Volatility Model with Constant and Time-Dependent Coefficients

Local Stochastic Volatility Model

Multi-factor BS/Dupire/ Heston/ Bates basket models

One-factor Dupire and Two-Factor Heston models for equity index exotics

Quanto equity model

SABR Model

Vanna-Volga

Commodities

Andersen model

Black Model (Estimating seasonality coefficients from historical data)

Deterministic Model

Gabillon Model/Gabillon 3F

Gibson-Schwartz 2F model with stochastic convenience yield

Gibson-Schwartz Local Volatility Model

Gibson-Schwartz Model

Heston Stochastic Volatility Model

Local Volatility Model

Schwartz 1F Model with Mean Reverting Dynamics

Hybrid

Hybrid models using any model listed above for interest rates, credit, equity, FX and commodities as building blocks, with deterministic or stochastic components correlations between different asset classes

Inflation

Inflation Market Model

JY (Jarrow-Yildirim) Model

Black Model for CPI

INSTRUMENTS

Interest Rates

Vanilla Swaps

Amortizing Swaps

Asset swaps

Average Index Swap (Average Fixed Floating Interest Rate Swap)

Average Overnight Futures Instrument

BMA Swaps

CMS Vanilla Swaps

Floating Rate Notes (with discount margin)

Forward Rate Agreements

In-Arrears Swaps

Money Market Instruments

OIS / EONIA Swaps

Tax-Exempt Swaps

Vanilla Swap

Zero Coupon Swaps

Cross Currency Swaps

Cross-Currency ARR Basis Swap

Cross-Currency Basis Swap/ Swaption

Cross-Currency Compound Fixed Float Swap

Cross Currency Swaps

Cross-Currency Power Reversal Dual Currency (PRDC) Swap with a Targeted Redemption

Cross-Currency Resettable Basis Swap

Cross-Currency Structured Fixed Float Swap with Digital Option

Cross-Currency TARN Swap

IR Cash Deposit

IR General Average Index Swap/Basis Swap

Vanilla Options

Averaging Cap/Floor

Caps/Floors

Capped Swap

Differential swap/swaption

Index-Amortizing Swaption

Swaption (American/ European/Mid Curve)

Exotic

Average Rate Caps, Floors, Swaptions

Auto Cap/Floor

Autocap Cap/Floor Collar

Compound Index Fix Float Swap

Dual Currency CMS Spread Cap/Floor

European Swaption Call/Put Flexicap Flexifloor

Flexicap /Floor

Floating Interest Rate Swap

Knock-out swap/swaption

Non-Callable Snowblade Swap

Non-Callable Target Redemption Note (Tarn) CMS Spread Swap

Non-Callable Target Redemption Note (Tarn) Inverse Floater Swap

Power Reverse Dual-Currency (PRDC) Note

Power Reverse Dual-Currency (PRDC) Swap

Range Accrual Swap

Total Return Swap

Bermudan

Bermudan Callable CMS Inverse Floater Swap

Bermudan Callable CMS Swap

Bermudan Callable CMS Spread Swap

Bermudan Callable Dual-Range Accrual Swap

Bermudan Callable Fixed Float Swap

Bermudan Callable Inverse Floater Swap

Bermudan Callable Inverse Floater Swap

Bermudan Callable Quanto Inverse Floater Swap

Bermudan Callable Range Accrual Swap

Bermudan Callable Staircase Swap

Bermudan Callable Swap

Bermudan Callable CMS Inverse Floater Swap

Callable

Callable Cross-Currency Double Range Accrual Swap

Callable flip-flop

Callable Floating-Rate Note

Callable/Non-Callable Ratchet Swap

Callable Power Spread Swap

Callable Reverse Floater

Callable TARN note/swap

Callable Zero-Coupon Swap

CMS

Bermudan Callable CMS Spread Bonds

CMS cap/floor

CMS/Libor Cap/Floor

CMS Constant Maturity Swap

CMS Spread Cap/Floor

CMS Spread Steepener

Digital Cap/Floor on CMS/ Libor Underlying

Quanto

Quanto Auto Cap/Floor
Quanto Cap/Floor CMS
Quanto Cap/Floor Libor
Quanto CMS Spread Cap/Floor
Digital Cap on Quanto CMS Underlying (Digital CMS Cap Quanto)
Digital CMS Floor Quanto
Digital Libor Cap/Floor Quanto
Quanto Flexicap
Quanto Flexifloor
Quanto index swap/swaption

Fixed Income

Accrual Bonds
Amortizing Bonds
Bond Forwards
Bond Futures, Cash Settled
Bond Options
Bond/Loan Portfolios
Brady Bonds
Callable Bond
Callable Range Accrual Bond
Callable Zero-Coupon Bon
Callable/Putable Corporate Bonds
Callable Quanto CMS Reverse/ Inverse Floater Bond
Callable Quanto Inverse Floater Bond
CMS callable bond
Convertible Bonds
Cross Currency Callable Quanto CMS Spread Bond
Cross-Currency FX TARN Bonds
Discount Securities
Fixed Rate Corporate Bonds
Fixed Rate Passthroughs or Pools
Government & Corporate bonds
Inflation Linked Bond (INCLUDING YoY)
IO / PO bonds
Mexico Sovereign Fixed Coupon Bond
Mexico Sovereign Fixed Coupon Bond
Municipal / Tax-exempt Bonds
PAC Bonds & Companion PACs
Pro-Rata bonds
Single-Currency Inflation-Linked Bonds
South Africa Sovereign Bonds
Sovereign Fixed Coupon Bond from Mexico Based on the Udi Inflation Index
TAC Bonds & Companion TACs
Trigger Swap
Zero Coupon Bonds

Credit

Amortizing Credit Default Swap
Basket CDS, Cash Flows and Options
Basket Default Swaps
Bespoke Tranches
Cancellable Asset Swaps
Cashflow CDOS
CDO-Squared
CDO Tranches (Synthetic & Standard)
CDO Tranche Cash Flows
CDO Tranche Linked Notes
CDS Index options
CDS on Indices
CDS on Single Names, Cash Flows, & Options
Constant-Maturity CDS
Credit Baskets
Credit Default Swap/ Swaptions
Credit Linked Notes
Credit Spread Options
First-to-Default, Nth-to-Default, N-Out-of M to Default
First Loss CDS and CDO Tranches
Loan CDS/Indices
Loss CDF
Options on CDS Indices
Rating Sensitive Notes
Single Tranche Bespoke CDO
Single Tranche CDO
Single Tranche CDO (Interest-Only, Principal Only, Portfolio)
Synthetic Single-Tranche CDOS
Total Return Swaps
Zero Coupon Bond

Foreign Exchange

Linear

MTM cross-currency basis swaps
Forwards
FX Swap
Futures

Vanilla Options

American
European

Asian Options

Asian Options
Asian Dual Put/Call FX Option
Average Strike
Asian Strike Call/Put FX Option
Asian Underlying Call/Put FX Option

Barrier Options

Barrier Options
Barrier Down call/put continuous
Barrier Down-Style Call/Put
Barrier Up-Style Call/Put
Double Barrier Call/Put
FX Single/Double Discrete Barrier

Digital

Barrier Double Digital at End
Barrier Double Digital No Touch
Barrier Double Digital on Hit
Binary Spread
Digital Call/Put No Touch
Digital Call/Put One Touch at End
Digital Call/Put One Touch on Hit

Exotic

Accumulator
Basket
Best-of/Worst-of-Basket Option
Chooser Option
Cliquet Call/Put
Compound Call/Put on an American/ European Call/Put

Conditional Variance Swap/ Put

Deferred Strike (Forward Start)

Double Average

Employee Stock Options

Fader Option

Forward-Start Call/Put Option

FX Linked Note

FX Target Redemption Note

Instalment Option

Lookback Options

Lookback Range Call/Put

Lookback Strike Call/Put

Max/Min-of-basket option

Multi-Asset

Power & Quotient

Range Accrual Option/Swap

Realized Volatility Swap

Target FX Forward

Two Assets Out-Performance-of Basket Option

Two Assets Out-Spread-of Basket Option

Variance/Volatility Swaps

Commodity

Linear

Forward

Future

Swaps

Swap Commodity/FX

TARS Swap

Vanilla Options

Options on Commodity Futures

Swaptions

Exotic

Accumulator

American/European Asian Commodity Options

Asian

Autocallable Note

Basket Autocallable Note

Basket with Trigger

Best-of/worst-of-N asset basket option

Best-of/worst-of-N performance basket option

Bullet Option

Calendar Spread Option

Commodity-linked note

Crack Spread Option

Interest Rate Swap with Trigger

Principal-protected note

Range Accrual Note

Spread

Target Redemption Note

Inflation

Swaps

Cross-Currency Inflation-Linked Bond/Swap

Inflation Swaps

Inflation Linked Swap (including YoY)

Limited Price Index (LPI) Swap

Treasury Inflation Protected Securities (TIPS)

Zero-Coupon Inflation Indexed Swap

Options

Callable Inflation Swap

Inflation Cap/Floor

Year-On-Year Inflation Cap/ Floor

Equities

Linear

Dividend Futures/Swaps

Forwards

Futures

Vanilla

American

European

Asian

Asian Dual Call/Put Option

Asian Options

Asian Strike Call/Put Option

Asian Underlying Call/Put Option

Barrier

Barrier Options

Barrier Double Digital at End Option

Barrier Double Digital No Touch Option

Barrier Double Digital on Hit Option

European Up/Down-Style Barrier Call/Put Equity Option

Installment Option Knock-In (KI) Knock-Out (KO) Barrier Option

Basket

Basket Call/Put Option

Best of/Worst of N Asset Equity Basket Option

Best of/Worst of N Performance Equity Basket Option

Equity Baskets Equity Call/ Put Spread Option

Compound

Compound Options

Compound Quanto European Call/Put on American Call/Put Option

Binary

Binary Spread

Digital call/put

Digital call/put no touch

Digital call/put one touch at end

Digital call/put one touch on hit

Digital Options

European Double Barrier Call/Put Equity Option
European Equity Call/Put Option

Exotic

Accelerated Share Repurchase (ASR)

Average Growth Protected Option

Auto-callable single asset option

Bermudan

Booster Note

Callable Bull/Bear Contract

Chooser

Conditional Variance Swap

Correlation Equity Basket Option

Corridor Variance Swap

Deferred Strike (Forward Start)

Double Average

Employee Stock Options

Equity-Linked Note (ELN) With KnockIn (KI) And Knock-Out (Ko) Barriers

EQ IR Performance Linked Swap

European Call/Put on an American/ European Call/Put Option

European Cliquet Equity Call/Put Option

Fader Option

Forward-Start Call/Put Option

Galaxy (or Swing) Equity Basket Option

Instalment Option

Locked Return Option

Lookback Call/Put Option

Lookback Range Call/Put Option

Lookback strike call/put

Mountain range basket options (Altiplano, Annapurna, Atlas, Everest, Himalayan)

Multi-Asset

Napoleon Equity Basket Option

Podium Basket Option

Power & Quotient

Range Accrual Option

Realized Volatility Swap

Reverse Convertible Option

Spread

Timer Option

Total Return Swap

Variance Swap

Volatility Swap

Quanto

Quanto Barrier Digital Call/ Put at End Equity/on Hit Option

Quanto Barrier Double Digital at End/No Touch/on Hit Equity Option

Quanto Digital Call/Put Equity Option

Quanto European Asian Strike Call/Put

Quanto European Asian Underlying Call/Put

Quanto European Call/Put on Call/Put Option

Quanto European Double Barrier Call/Put

Quanto European Asian Dual Call/Put

Quanto Equity Lookback Call/Put Option

Quanto Equity Lookback Range Call/Put Option

Quanto Equity Lookback Strike Call/Put Option

Quanto No Touch Equity Digital Call/Put Option

Quanto Barrier Digital Call/ Put at End Equity/on Hit Option

Quanto Barrier Double Digital at End/No Touch/on Hit Equity Option

Quanto Digital Call/Put Equity Option

Quanto European Asian Strike Call/Put

Quanto European Asian Underlying Call/Put

Quanto European Call/Put on Call/Put Option