# Comprehensive Multi-Asset Coverage

## COMMODITY
- Options
  - Asian
  - Average strike
  - Double average
  - Deferred strike (forward start)
  - Barriers (knock in/out)
    - Single & double
    - Binary
    - Single barrier
    - Digital
    - Multi-asset
    - Baskets
    - Cliquets
    - Chooser
    - Compound
    - Lookback
    - Power & quotient
    - Spread
- Vanilla
- Swaps, swaptions
- Variance Swaps
  - Conditional
  - Corridor
  - Capped/floored
- Volatility swaps
- Variance Options
- Forwards/Futures

## CONVERTIBLE BONDS
- Functions output fair value, probability of conversion, and full risk statistics
- Coupon step-up/down/rollercoaster
- Amortizing/accreting/odd coupon
- Adjustments for the dilution effect of conversion
- Cash flow tables
- Cash payments on conversion
- Conversion caps
- Convertibles with callable/puttable features
- Fixed or varying exchange ratios
- Implied spread calculations
- Implied volatility calculations
- Repo spread (borrowing cost)
- Soft calls

## CREDIT
- Asset swaps
- Collateralized Debt Obligation (CDO) & indices
  - CDO Tranches (synthetic & standard)
  - CDO Tranche cash flows
  - CDO Tranche Linked Notes
  - CDS index options
  - CDS on indices
  - First loss CDS and CDO tranches
  - Base correlation mapping
  - Bespoke tranche pricing & risk
  - Calibration of base correlation
- Credit Default Swaps (CDS)
  - Options
  - Cash flows
  - ABS CDS
- Loan Credit Default Swaps
- Constant Maturity Default Swaps (CMS)
- Credit Index Basis Adjustments

## FIXED INCOME
- Money market instruments
  - Discount securities
  - Interest at maturity
  - Forward rate agreements
- Non-callable bond coverage (fixed rate)
  - Coupon step-up/down/rollercoaster
  - Amortizing/accreting
  - Zero coupon
- Non-callable bond coverage (floating rate)
  - Vanilla & user-defined
  - Amortizing/accreting
  - Compounding or averaging

## VALUE-AT-RISK
- Calculate component VaR
- Calculate linear VaR from mapped cash flows
- Calculate volatility and correlation matrices
- Map cash flows to pre-defined risk points
- Rebase volatility and correlation data to a different currency

## EQUITY
- Options
  - Asian
  - Average strike
  - Double average
  - Deferred strike (forward start)
- Barriers (knock in/out)
  - Single & double
  - Binary
  - Digital
  - Napoleon
- Multi-asset
  - Baskets
  - Cliquets
  - Chooser
- Compound
- Lookback
- Power & quotient
- Spread
- Employee stock options
  - Vanilla
  - Index
  - Portfolio
  - Warrants

## Forwards/Futures
Comprehensive Multi-Asset Coverage

FOREIGN EXCHANGE
Options
- Asian
- Average strike
- Double average
- Deferred strike (forward start)
- Barriers (knock in/out):
  - Single & double Binary
- Binary spread
  - Digital
  - Single barrier
- Multi-asset
  - Baskets
  - Cliquets
  - Napoleon
- Vanilla
- Lookback
- Spread
- Variance
- Swaps
  - Conditional
  - Corridor
  - Capped/floored

MORTGAGE-BACKED SECURITIES
- Accrual bonds
- CMOs
- Fixed-rate pass-throughs or pools
- Implied prepayment speed given price and yield / z-spread
- IO/PO bonds
- PAC bonds & companion PACs
- Prepayment analysis
- Prepayment utilities
- Price given yield / z-spread and prepayment vector
- Pre-rata bonds
- Sequential bonds
- Spread analysis
- TAC bonds & companion TACs
- Utilities for creating prepayment vectors (PSA, ABS, CPR <-> SMM)
- Yield analysis
- Yield / z-spread given price and prepayment vector

INTEREST RATE
Accrual swaps
- Asset swaps–vanilla & cross-currency
- Caps/Floors
  - Vanilla
  - Digital
  - User-defined
  - Averaging
  - Swaps
    - Vanilla/amortizing swaps
    - Percentage of LIBOR swaps
    - Credit Exposure
    - Credit Value Adjustment (CVA)
    - Brazilian Swaptions
      - In-arrears swaps
      - OIS/EONIA swaps
      - Basis swaps, swaptions
      - Zero coupon swaps
      - Credit Contingent Interest Rate Swaption styles
        - European
        - Bermudan

MUNICIPAL
- Basis swaps (e.g. SIFMA vs. LIBOR)
- SIFMA swap curves (using swap rates or basis factors)
- Caps/floors with averaging features (SIFMA Caps)
- Cash flow calculations
- Fixed vs. floating swaps (e.g. SIFMA vs. Fixed)
- Percentage of LIBOR swaps
- Serial bond pools
- Serial callable bond pools
- Swaptions
- Variable rate debt
- Amortizing Municipal Swaps

INFLATION
Cash flow generation
- Generic inflation bond functions
- Emerging market inflation curves
- Inflation swaps: year-on-year, zero coupon
- Inflation indexed bonds:
  - Australia, Brazil, Canada, France, Germany, Italy, Japan, South Africa, Sweden, Turkey, UK, USA
- Par rates

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UTILITY
- Date generation/adjustment / flexible weekend DEF
- IMM date compliance/upfront payments for CDS
- Greeks & risk sensitivities
- Implied volatility
- Credit loss distribution calculations
- DV01
- Interpolation
- Implied calculations
  - Volatility, strike, rates, etc.
  - Goal seek on any parameter
  - Risk measures: Greeks
  - Cash flow functions & calculations
    - Ability to:
      - implement single rates or curves
      - take in discreet dividends or yield
  - Graph the volatility surface (smile, skew)
  - Dividend to yield conversion
  - Conversion factors
  - Yield to maturity
  - Discount margin
  - Volatility bootstrapping
  - Base correlation mapping
  - Command Line Licensing
  - Table merge/sort/cleanup
  - Any parameter implied from price
  - Holiday List data
  - Nested error validation

CURVE BUILDING METHODS
- Swap curves
- Bond
- SIFMA
- OIS
- Dual Libor-OIS
- Separate discount and forward curves