UnRisk
Release Notes Version 8.0
(November 2014)

1. Introduction

This document gives an overview of the changes in UnRisk from Version 7.0 to Version 8.0

See the following sections for a detailed overview.

For installing the software (new installation or update form an older version), follow the steps in the installation instructions.

2. New Utilities

2.1. Yield Curve Bootstrapping from Discount Yield Curve and Forward Swap Curve

In version 8.0 of UnRisk we introduce the new bootstrapping method: a yield curve may now be boostrapped from a (risk-free) discount curve and a (LIBOR) swap curve.

2.2. Caplet Bootstrapping

In version 8.0 of UnRisk we introduce the possibility to strip (lognormal (Black76) or normal (Bachelier)) caplet volatilities from a given cap volatility matrix.

2.3. Volatility Transformation

In version 8.0 of UnRisk we introduce functions for the transformation of lognormal (Black76) / normal (Bachelier) swaption or caplet volatilities to the equivalent normal (Bachelier) / lognormal (Black76) volatilities

3. New Stochastic Interest Rate Model related Features

3.1 New Interest Rate Model: Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce a new stochastic interest rate model, the multi curve 1 factor model. Models of this type may be calibrated according to Black76 / Bachelier cap and swaption volatilities and from a given (risk-free) discount curve and a LIBOR curve.

3.2. Calibration of Interest Rate Models from Normal (Bachelier) Volatilities

In version 8.0 of UnRisk we introduce the possibility to calibrate a stochastic interest rate model (General Hull & White, Black Karasinski, Hull & White 2 Factor, Multi Curve 1 Factor) according to normal (Bachelier) cap / swaption volatilities - this is an alternative to the calibration according to lognormal (Black76) volatilities.

3.3. Calibration of Interest Rate Models with Constant Parameters

In version 8.0 of UnRisk we introduce the possibility to calibrate a stochastic interest rate model (General Hull & White, Black Karasinski, Hull & White 2 Factor, Multi Curve 1 Factor) with constant parameters - this is an alternative to the calibration of term-dependent parameters.

4. New Valuation Features

4.1. Valuation of Vanilla Caps / Floors under the Bachelier model

In version 8.0 of UnRisk we introduce the possibility to price vanilla caps / floors under the Bachelier model (i.e. under normal volatilities).

4.2. Valuation of Vanilla Caps / Floors under a Caplet Volatility Matrix

In version 8.0 of UnRisk we introduce the possibility to price vanilla caps / floors under a matrix containing lognormal (Black76) or normal (Bachelier) caplet volatilities.

4.3. Valuation of Vanilla Caps / Floors taking into account a Discount and a Forward Curve

In version 8.0 of UnRisk we introduce the possibility to price vanilla caps / floors under a Black76 or Bachelier model by taking into account a (risk-free) discount curve and a LIBOR curve.

4.4. New Vanilla Cap / Floor Valuation Output: Greeks

In version 8.0 of UnRisk the pricing function for vanilla caps / floors under a Black76 / Bachelier model returns also the following greeks: delta, gamma, vega and theta (for the whole cap and for each caplet).

4.4. Valuation of Vanilla Caps / Floors under the Bachelier model

In version 8.0 of UnRisk we introduce the possibility to price vanilla caps / floors under the Bachelier model (i.e. under normal volatilities).

4.5. Valuation of Forward Start Swaptions under the Bachelier model

In version 8.0 of UnRisk we introduce the possibility to price forward start swaptions under the Bachelier model (i.e. under normal volatilities).

4.6. Valuation of Forward Start Swaptions taking into account a Discount and a Forward Curve

In version 8.0 of UnRisk we introduce the possibility to price forward start swaptions under a Black76 or Bachelier model by taking into account a (risk-free) discount curve and a LIBOR curve.

4.7. New Forward Start Swaption Valuation Output: Greeks

In version 8.0 of UnRisk the pricing function for forward start swaptions under a Black76 / Bachelier model returns also the following greeks: delta, gamma, vega and theta.

4.8. Valuation of (Callable / Putable) General Constant Maturity Floater under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price callable / putable general constant maturity floater under a Multi Curve 1 Factor model (expected coupon rates and survival probabilities may also be calculated under this model).

4.9. Valuation of (Callable / Putable) Ratchet Floater under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price callable / putable ratchet floater under a Multi Curve 1 Factor model (expected coupon rates and survival probabilities may also be calculated under this model).

4.10. Valuation of (Callable / Putable) Snowball Floater under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price callable / putable snowball floater under a Multi Curve 1 Factor model (expected coupon rates and survival probabilities may also be calculated under this model).

4.11. Valuation of (Callable / Putable) General Constant Maturity Floater of Type 2 under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price callable / putable general constant maturity floater of type 2 under a Multi Curve 1 Factor model (expected coupon rates and survival probabilities may also be calculated under this model).

4.12. Valuation of (Callable / Putable) Digital Range Accruals under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price callable / putable digital range accruals under a Multi Curve 1 Factor model (expected coupon rates and survival probabilities may also be calculated under this model).

4.13. Valuation of Autocallable General Constant Maturity Floater under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price autocallable general constant maturity floater under a Multi Curve 1 Factor model (expected coupon rates and survival probabilities may also be calculated under this model).

4.14. Valuation of Max / Min Volatility Bonds under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price max / min volatility bonds under a Multi Curve 1 Factor model (expected coupon rates may also be calculated under this model).

4.15. Valuation of (Callable / Putable) Volatility Bonds under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price callable / putable volatility bonds under a Multi Curve 1 Factor model (expected coupon rates and survival probabilities may also be calculated under this model).

4.16. Valuation of Vanilla Caps / Floors under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price vanilla caps / floors under a Multi Curve 1 Factor model.

4.17. Valuation of Forward Start Swaptions under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price forward start swaptions under a Multi Curve 1 Factor model.

4.18. Valuation of Target Redemption Notes

In version 8.0 of UnRisk we introduce the possibility to price target redemption notes under a Multi Curve 1 Factor model (survival probabilities may also be calculated under this model).

4.19. Valuation of Target Redemption Snowball Floater under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price target redemption snowball floater under a Multi Curve 1 Factor model (survival probabilities may also be calculated under this model).

4.20. Valuation of Target Redemption Digital Range Accruals under a Multi Curve 1 Factor Model

In version 8.0 of UnRisk we introduce the possibility to price target redemption digital range accruals under a Multi Curve 1 Factor model (survival probabilities may also be calculated under this model).