Adenza

Model Validation Report

Calypso FX Averaging Rate Asian Options with FXOMarket/FXOTheoretical Pricers

Version 1.1

November 27, 2022

Adenza Proprietary and Confidential

Report Summary

This document describes validation of the FX Arithmetic Average Rate Asian Option with FXOMarket and FXOTheoretical Pricers.

Reference

[1] Espen Gaarder Haug, *The Complete Guide to Option Pricing Formulas*, 2nd Edison, McGraw-Hill, 2006

Document History

Revision History

Version Number	Revision Date	Author	Summary of Changes
1.0	2/22/2023	Chang-Cheng Yang	Initial Draft
1.1	11/27/2023	Chang-Cheng Yang	Added FXOTheoretical

Distribution

Name	Title	Date	Version Number

Contents

Section 1. Sample Trades

We use the following Asian Arithmetic Average Rate Option Trades as test cases:

Default Rate Sides	Choice
GBP/USD Spot	1.21370000
GBP/USD_Reuters	
GBP SONIA 1D Curve	GBP.Sonia.Vanilla
GBP/USD Vol	GBP.USD.FXOption
USD SOFR 1D Curve	USD.SOFR.1D
Pricing	
Valuation Date	02/09/2023
Valuation Time	11:00:00 AM
Pricing Env	OFFICIAL
Output 1 or 2 way	1-way
Solver	
Leg 1 Details	
FX Spot	1.21370000
Fwd Points	-12.336
FX Fwd	1.21246640
Volatility	
Ccy 1 Rate	0.441765
Ccy 2 Rate	0.212145
Valuation FX Date	02/09/2023
Valuation Spot Date	02/13/2023
Pricing Model	FXOMarket
FX_POINTS	false
INCLUDE_FEES	false
MKT_ACCRUAL_FA...	
MKT_ASIAN_CASH_I...	Theoretical
MKT_SELF_QUANT...	Best
MKT_THIRD_CCY_...	Theoretical
NPV_INCLUDE_CASH	false
TV_ASIAN_ARITH_P...	Log Normal
TV_ATM_TYPE	Market Concordant
TV_USE_FLAT_TER...	false
USE_SMILE_VOL	true
ZD_PRICING	true

Strategy Name		Asian	Asian	Asian
Price		Price	Price	Price
Save		Save	Save	Save
Solve		Don't Solve	Don't Solve	Don't Solve
Trade Id		72201	-14	-16
Ccy Pair		GBP/USD	GBP/USD	GBP/USD
Notional Ccy		GBP	GBP	GBP
Notional		100,000,000.00	100,000,000.00	100,000,000.00
Expiry Delivery Link		On	On	On
Expiry Date		07/25/2023	07/25/2023	07/25/2023
Expiry		TUE 166d 5M+12	TUE 166d 5M+...	TUE 166d 5M+...
Expiry Cut				
Delivery Date		07/27/2023	07/27/2023	07/27/2023
Strike		1.41000000	1.41000000	1.41000000
Observation Source		GBP/USD_Reuters	GBP/USD_Reu...	GBP/USD_Reu...
Settle Type		Cash	Cash	Cash
Settle Ccy		USD	USD	USD
Put/Call		GBP Put	GBP Put	GBP Put
Observation Type		Average Rate	Average Rate	Average Rate
FX Spot		1.21370000	1.21370000	1.21370000
Fwd Points		-12.336	-12.336	-12.336
FX Fwd		1.21246640	1.21246640	1.21246640
Ccy 1 Rate		0.441765	0.441765	0.441765
Ccy 2 Rate		0.212145	0.212145	0.212145
Pricing Model		FXOMarket	FXOMarket	FXOTheoretical
FX_POINTS		☐	☐	☐
ZD_PRICING		☑	☑	☑
INCLUDE_FEES		☐	☐	☐
ALL_MEASURES_INCL...				
NPV_INCLUDE_CASH		☐	☐	☐
VOLATILITY				
TV_ATM_TYPE		Market Concordant	Market Concor...	Market Concor...
TV_USE_FLAT_TERM...		☐	☐	☐
TV_ASIAN_ARITH_PR...		Log Normal	Log Normal	Log Normal
USE_SMILE_VOL		☑	☐	
PV USD	59,076,756.06	19,692,440.16	19,692,157.95	19,692,157.95
PV GBP	48,672,665.72	16,224,376.91	16,224,144.40	16,224,144.40

The above are three identical Average Rate option trades. The first trade is priced using FXOMarket Pricer with USE_SMILE_VOL = True. The second trade is priced using FXOMarket Pricer with model parameter USE_SMILE_VOL = False, *i.e.,* ATM Volatilities are applied. The third trade is priced using FXOTheoretical Pricer where ATM Volatilities are applied.

The Daily Fixing Schedule

Averaging Schedule | Cash Settled Info

Rate Type	Average
Averaging Method	Arithmetic
Start Date	02/01/2023
End Date	07/25/2023
Frequency	DLY
Day To Roll On	
Holiday	LON, NYC
Ignore Holidays	☐
Weighted	☐
Generate From ...	☐

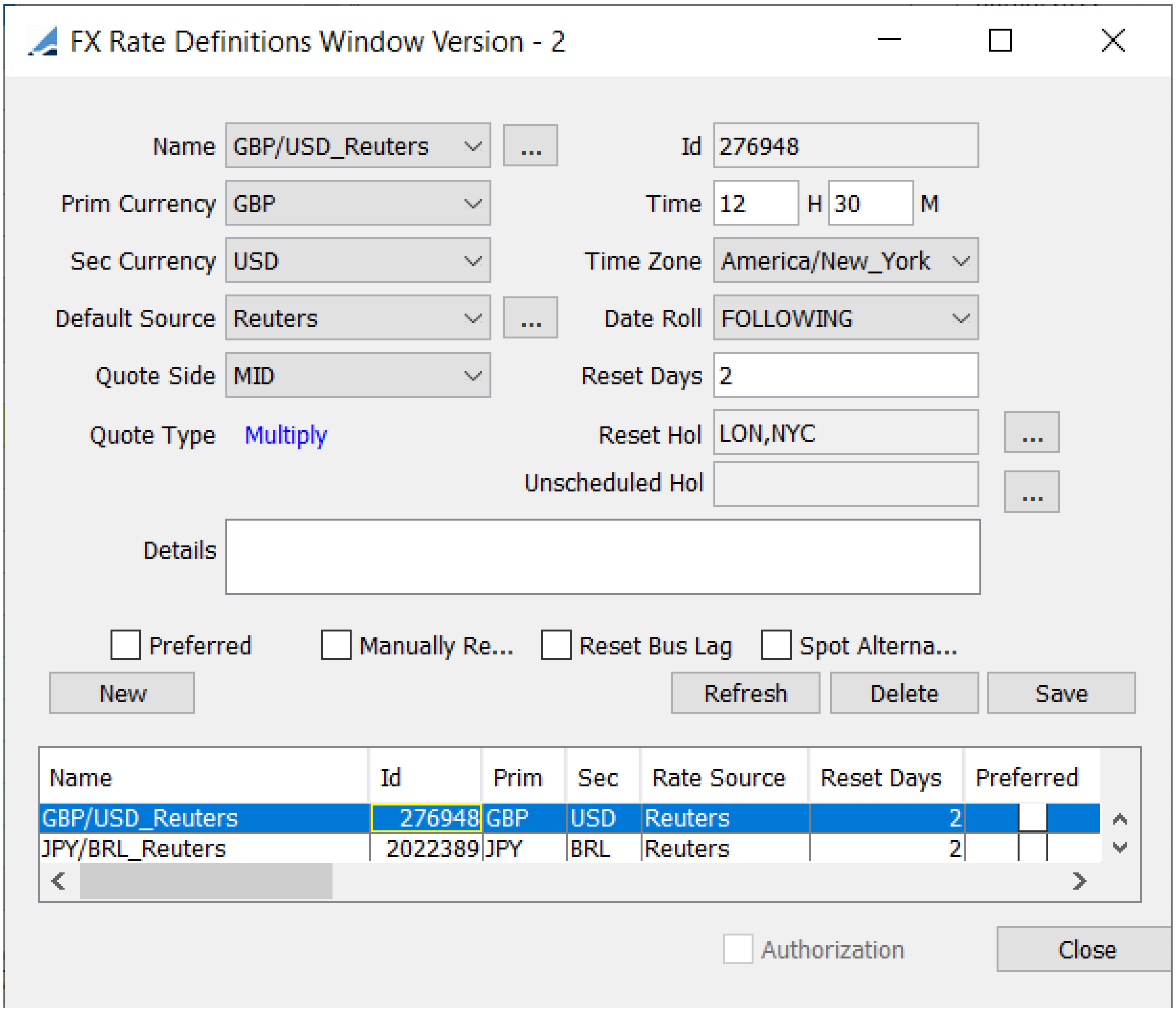
Rate: arithmetic 1.2135, 7 running, 119 total

Sample Date	Weight	Reset	Ccy1 Rate	Ccy2 Rate	Volatility
02/01/2023	1	1.23870000	0.47732	0.07407	0
02/02/2023	1	1.22220000	0.47732	0.07407	0
02/03/2023	1	1.20480000	0.47732	0.07407	0
02/06/2023	1	1.20260000	0.47732	0.07407	0
02/07/2023	1	1.20540000	0.47732	0.07407	0
02/08/2023	1	1.20710000	0.47600	0.07272	0
02/09/2023	1	1.21370000	0.47600	0.07272	0
02/10/2023	1	0.00000000	0.47600	0.07272	0
02/13/2023	1	0.00000000	0.47600	0.07272	0
02/14/2023	1	0.00000000	0.47600	0.07272	0
02/15/2023	1	0.00000000	0.47600	0.07696	0
02/16/2023	1	0.00000000	0.47055	0.07951	0
02/17/2023	1	0.00000000	0.46691	0.08121	0
02/21/2023	1	0.00000000	0.45964	0.08460	0
02/22/2023	1	0.00000000	0.45865	0.08261	0
02/23/2023	1	0.00000000	0.45783	0.08096	0
02/24/2023	1	0.00000000	0.45713	0.07956	0
02/27/2023	1	0.00000000	0.45557	0.07640	0
02/28/2023	1	0.00000000	0.45517	0.07560	0
03/01/2023	1	0.00000000	0.45481	0.07605	0
03/02/2023	1	0.00000000	0.45450	0.07645	0
03/03/2023	1	0.00000000	0.45421	0.07681	0
03/06/2023	1	0.00000000	0.45351	0.07771	0
03/07/2023	1	0.00000000	0.45331	0.07795	0
03/08/2023	1	0.00000000	0.45313	0.07817	0
03/09/2023	1	0.00000000	0.45308	0.07837	0
03/10/2023	1	0.00000000	0.45304	0.07856	0
03/13/2023	1	0.00000000	0.45291	0.07904	0
03/14/2023	1	0.00000000	0.45288	0.07918	0
03/15/2023	1	0.00000000	0.45285	0.07931	0
03/16/2023	1	0.00000000	0.45281	0.07944	0
03/17/2023	1	0.00000000	0.45279	0.07955	0
03/20/2023	1	0.00000000	0.45271	0.07987	0
03/21/2023	1	0.00000000	0.45269	0.07996	0
03/22/2023	1	0.00000000	0.45267	0.08005	0
03/23/2023	1	0.00000000	0.45265	0.08013	0
03/24/2023	1	0.00000000	0.45263	0.08021	0
03/27/2023	1	0.00000000	0.45258	0.08043	0
03/28/2023	1	0.00000000	0.45256	0.08049	0
03/29/2023	1	0.00000000	0.45255	0.08056	0
03/30/2023	1	0.00000000	0.45254	0.08062	0
03/31/2023	1	0.00000000	0.45252	0.08067	0
04/03/2023	1	0.00000000	0.45249	0.08083	0
04/04/2023	1	0.00000000	0.45248	0.08088	0
04/05/2023	1	0.00000000	0.45247	0.08093	0
04/06/2023	1	0.00000000	0.45246	0.08098	0
04/11/2023	1	0.00000000	0.45233	0.08132	0

Rate Type	Average
Averaging Method	Arithmetic
Start Date	02/01/2023
End Date	07/25/2023
Frequency	DLY
Day To Roll On	
Holiday	LON, NYC
Ignore Holidays	☐
Weighted	☐
Generate From ...	☐

Sample Date	Weight	Reset	Ccy1 Rate	Ccy2 Rate	Volatility
05/17/2023	1	0.00000000	0.44979	0.08324	0
05/18/2023	1	0.00000000	0.44971	0.08328	0
05/19/2023	1	0.00000000	0.44962	0.08332	0
05/22/2023	1	0.00000000	0.44939	0.08343	0
05/23/2023	1	0.00000000	0.44931	0.08347	0
05/24/2023	1	0.00000000	0.44924	0.08350	0
05/25/2023	1	0.00000000	0.44917	0.08353	0
05/26/2023	1	0.00000000	0.44910	0.08357	0
05/30/2023	1	0.00000000	0.44883	0.08370	0
05/31/2023	1	0.00000000	0.44876	0.08373	0
06/01/2023	1	0.00000000	0.44870	0.08376	0
06/02/2023	1	0.00000000	0.44864	0.08379	0
06/05/2023	1	0.00000000	0.44846	0.08387	0
06/06/2023	1	0.00000000	0.44840	0.08390	0
06/07/2023	1	0.00000000	0.44835	0.08393	0
06/08/2023	1	0.00000000	0.44829	0.08394	0
06/09/2023	1	0.00000000	0.44824	0.08395	0
06/12/2023	1	0.00000000	0.44793	0.08398	0
06/13/2023	1	0.00000000	0.44781	0.08398	0
06/14/2023	1	0.00000000	0.44768	0.08399	0
06/15/2023	1	0.00000000	0.44757	0.08400	0
06/16/2023	1	0.00000000	0.44745	0.08401	0
06/19/2023	1	0.00000000	0.44711	0.08403	0
06/20/2023	1	0.00000000	0.44700	0.08404	0
06/21/2023	1	0.00000000	0.44689	0.08405	0
06/22/2023	1	0.00000000	0.44678	0.08406	0
06/23/2023	1	0.00000000	0.44668	0.08407	0
06/26/2023	1	0.00000000	0.44637	0.08409	0
06/27/2023	1	0.00000000	0.44627	0.08409	0
06/28/2023	1	0.00000000	0.44617	0.08410	0
06/29/2023	1	0.00000000	0.44608	0.08411	0
06/30/2023	1	0.00000000	0.44598	0.08411	0
07/03/2023	1	0.00000000	0.44571	0.08413	0
07/05/2023	1	0.00000000	0.44553	0.08415	0
07/06/2023	1	0.00000000	0.44544	0.08415	0
07/07/2023	1	0.00000000	0.44536	0.08416	0
07/10/2023	1	0.00000000	0.44496	0.08432	0
07/11/2023	1	0.00000000	0.44472	0.08439	0
07/12/2023	1	0.00000000	0.44449	0.08446	0
07/13/2023	1	0.00000000	0.44427	0.08453	0
07/14/2023	1	0.00000000	0.44404	0.08460	0
07/17/2023	1	0.00000000	0.44339	0.08481	0
07/18/2023	1	0.00000000	0.44318	0.08488	0
07/19/2023	1	0.00000000	0.44297	0.08495	0
07/20/2023	1	0.00000000	0.44276	0.08501	0
07/21/2023	1	0.00000000	0.44256	0.08508	0
07/24/2023	1	0.00000000	0.44196	0.08526	0
07/25/2023	1	0.00000000	0.44176	0.08533	0

FX Fixing Source (Cash Settle Case):



Note that the FX Reset time is 12:30PM NY Time Zone. In our example the valuation date time is “9-Feb-2023 11AM” so that the FX fixing rate on valuation date is unknown and the FX rate on valuation date have to be forecasted from given market curves.

Section 2. FXOMarket/FXOTheoretical Pricers Analysis

2.1 The Average Rate Model

The Average Rate Asian options are options where the payoff depends on the arithmetic average of the price of the underlying asset against a given strike during the life of the option.

The payoff from an average rate option is:

$$\max(\phi(A_T - K), 0) \qquad \text{(A)}$$

where,

$$A_T = \frac{1}{m+n}\sum_{j=1}^{m+n} S_j = \sum_{j=1}^{m+n} w * S_j, \quad w = \frac{1}{m+n}$$

Here we assume there are m known fixings $S_j,\ j \le m$ by the valuation time and n unknown fixings $S_j,\ m < j \le m+n$ on future observation dates $\{T_i;\ i = 1, \cdots, n\}$. S_T is the expected fixing on the last fixing date T_n

$\phi = 1,\ if\ \ call;\ \ -1\ if\ \ put$

We assume that the underlying asset value S is lognormally distributed satisfies the Geometric Brownian process:

$$dS = (r_d - r_f)Sdt + \sigma SdW$$

Or equivalently,

$$d(\ln S) = (r_d - r_f - 0.5\sigma^2)dt + \sigma dW \qquad \text{(B)}$$

Or

$$S(t) = S(0)e^{(r_d - r_f - 0.5\sigma^2)t + \sigma\sqrt{t}\varepsilon} = F(t)e^{-0.5\sigma^2 t + \sigma\sqrt{t}\varepsilon}$$

The standard volatility of S is then:

$$\sigma[S(t)] = e^{\sigma^2 t} - 1$$

Where $v(t) = \sigma^2 t$ is the time-variance interpolated from the assigned volatility surface.

We define the averaged known fixings (there are 7 fixing rates in our example) as

$$K_0 = spread = \sum_{j=1}^{m} w * S_j \text{ for arithmetic case}$$

For each future observation date time T_i, (trade cut time) we can calculate the forward FX rate, denoted as f_i (there are 113 forecasting FX fixing rates in our example):

$$f_i = S(0) * \frac{Df^{Pri}(spotDate(T_i)) / Df^{Pri}(spotDate)}{Df^{Quo}(spotDate(T_i)) / Df^{Quo}(spotDate)} \quad \text{(C)}$$

2.2 Calibration of Schedule Variances

2.2.1 Smile Volatility Adjustment

When the model parameter USE_SMILE_VOL = true for Arithmetic average case, we apply the following smile volatility interpolation methods:

For each future observation date time T_i, we interpolate the corresponding time-variance from the volatility surface on each forward rate f_i:

$$v_i = volatilitySurface_{Smile}(f_i;\ valDateTime, volSurfaceDateTime, T_i, spotFX, f_i, timeZone) \qquad \text{(D)}$$

In our example

- $valDateTime = 2/9/2023\ \ 11AM$
- $T_i =$ every date from 2/9/2023 to 7/25/2023 $@12:30:00\ PM$

Please refer to the document "FX Volatility Surface Interpolation" for details. Note that due to the daily volatility will be interpolated from volatility surface so that we assume here the volatility date time is the same as valuation date time.

Arithmetic Average Rate Case

In this case, we take the normalized volatility of f_i by

$$\sigma_i = \sigma(f_i) = \sqrt{e^{v_i} - 1} \qquad \text{(E)}$$

We further adjust each forward FX rate by using volatility-weighted:

$$\tilde{f}_i = f_i + f_i * \tilde{\sigma}_i$$

where $\tilde{\sigma}_i = \sigma_i * \max\left(-\frac{1}{\sum_{j=1}^{n} w * f_j * \sigma_j}, \frac{K - \left(\sum_{j=1}^{n} w * f_j + K_0\right)}{\sum_{j=1}^{n} w * f_j * \sigma_j} \right)$

Here we can also control $\left(-\frac{1}{\sum_{j=1}^{n} w * f_j * \sigma_j}, \frac{K - \left(\sum_{j=1}^{n} w * f_j + K_0\right)}{\sum_{j=1}^{n} w * f_j * \sigma_j} \right)$ to be inside of the range of $[-32,\ 32]$ – the volatility-weighted forward rate f_i changes is bounded inside the range of $[f_i - 32 * f_i * \sigma_i,\ f_i + 32 * f_i * \sigma_i]$.

Using the above each smile-adjusted forward FX rate we then re-interpolate the time variance which we denote by $\tilde{v}_i$:

$$\tilde{v}_i = volatilitySurface_{Smile}(\tilde{f}_i;\ valDateTime, volSurfaceDateTime, T_i, spotFX, f_i, timeZone)$$

We then have:

$$\sigma_i = \sigma(f_i) = \sqrt{e^{\tilde{v}_i} - 1} \qquad \textbf{(F)}$$

Remark: In a special case where $m = 0,\ K_0 = 0,\ f_i \equiv f_c,\ \sigma_i \equiv \sigma_c$, and the forward rate is not far from strike, we then have:

$$\tilde{f}_i = f_i + f_i * \sigma_i * \max\left(-\frac{1}{f_c * \sigma_c}, \frac{K - f_c}{f_c * \sigma_c}\right) = f_c + \max(-1,\ K - f_c) \xrightarrow{most\ likely} K$$

The targeted variance is then interpolated on the strike in this special case which is similar to the vanilla European option valuation.

Thus, the above calibration process is trying to use the volatility skewness feature to find volatility which is slightly off the ATM volatility with certain boundaries.

Normally, there are not much discrepancy in valuation without calibration of variances when the market data is reasonable. In our example such discrepancy on PVs is about 0.08%.

The adjusted forward rates $\tilde{f}_i$ are used for skew-liked variances interpolation only. The original forward rates are used in the remaining option valuation.

2.2.2 Use ATM Volatility

When the model parameter USE_SMILE_VOL = False for Arithmetic average case. In this case FXOMarket Pricer is identical with FXOTheoretical Pricer as both use ATM volatilities in valuation.

There are two options to interpolate the ATM volatility driven by the model parameter TV_ATM_TYPE as follows:

TV_ATM_TYPE = Market Concordant

In this case, for each future observation date time T_i, we resolve for the corresponding ATM time-variance from the volatility surface:

$$v_{ATM,i} = volSurface_{Smile}(K_i^{implied}; valDateTime, volSurfaceDateTime, T_i, spotFX, f_i, timeZone) \qquad \textbf{(G)}$$

Such that for a call option with option premium in quoting currency and the delta quotes are in quoting currency, we have:

$$ForwardDelta = N\left(\frac{\ln(f_i / K_i^{implied}) + 0.5\sigma_{ATM,i}^2 T_i}{\sigma_{ATM,i}\sqrt{T_i}}\right) = 0.5$$

In this case the smile-adjustment in (**E**) and (**F**) is skipped and simply we use:

$$\sigma_i = \sigma_{ATM,i} \qquad v_i = \sigma_{ATM,i}^2 * T_i \qquad \textbf{(H)}$$

TV_ATM_TYPE = Forward

In this case, the volatility is directly interpolated from (**D**) on each forward rate.

2.3 Arithmetic Average Option Formula

2.3.1 The Turnbull-Wakeman's Moment Matching

We now define the first three moment functions for $X = A_T - K_0 = \sum_{i=1}^{n} w * f_i$ at given time t:

$$M_1 = \sum_{i=1}^{n} w * f_i$$
$$M_2 = \sum_{i=1,\, j>i}^{n} \left(w^2 * f_i^2 * e^{v_i} + 2w^2 * f_i * f_j * e^{v_i} \right)$$
$$M_3 = \sum_{i=1,\, j>i, k>j}^{n} \left(w^3 f_i^3 e^{3v_i} + 3w^3 f_i^2 f_j e^{3v_i} + 3w^3 f_i f_j^2 e^{2v_i + v_j} + 6w^3 f_i f_j f_k e^{2v_i + v_j} \right)$$

And the corresponding central moments are:

$$\mu_1 = M_1$$
$$\mu_2 = M_2 - \mu_1^2$$
$$\mu_3 = M_3 - 3\mu_1\mu_2 - \mu_1^3$$

On the other hand, based on Turbull-Wakeman' moment matching approach, we assume:

$$A_T - K_0 = \Delta + F * Z$$

for some to-be-defined constant coefficients Δ, F, V, and $Z = e^{-0.5V + \sqrt{V}\varepsilon}$ is a lognormal variable with $\varepsilon \propto N(0,1)$

Note that for a lognormally distributed variable Z, if $\ln Z \propto N(\mu_Z, \lambda_Z^2)$ then we have moments for any integer $n \geq 1$:

$$E[Z^n] = e^{n\mu_Z + 0.5n^2\lambda_Z^2}$$

Here $\ln Z \propto N(-0.5V, V)$ so that for any integer $n \geq 1$ we have

$$E[Z^n] = e^{-0.5nV + 0.5n^2V} = e^{0.5nV(n-1)}$$

By moment matching

$$\mu_1 = E[A_T - K_0] = E[\Delta + F * Z] = \Delta + F$$

$$\mu_2 = E[(A_T - K_0 - \mu_1)^2] = E[(\Delta + F * Z - \mu_1)^2]$$
$$= (\Delta - \mu_1)^2 + 2(\Delta - \mu_1)F * E[Z] + F^2 * E[Z^2]$$
$$= (\Delta - \mu_1)^2 + 2(\Delta - \mu_1)F + F^2 e^V$$

$$\begin{aligned}\mu_3 &= E[(A_T - K_0 - \mu_1)^3] = E[(\Delta + F * Z - \mu_1)^3] \\ &= (\Delta - \mu_1)^3 + 3(\Delta - \mu_1)^2 F * E[Z] + 3(\Delta - \mu_1) F^2 * E[Z^2] + F^3 * E[Z^3] \\ &= (\Delta - \mu_1)^3 + 3(\Delta - \mu_1)^2 F + 3(\Delta - \mu_1) F^2 e^V + F^3 e^{3V}\end{aligned}$$

Or

$$F = \mu_1 - \Delta$$

$$\mu_2 = -(\Delta - \mu_1)^2 + (\Delta - \mu_1)^2 e^V$$

$$\mu_3 = (\Delta - \mu_1)^3 - 3(\Delta - \mu_1)^3 + 3(\Delta - \mu_1)^3 e^V - (\Delta - \mu_1)^3 e^{3V}$$

The above equations have the following solutions:

$$\Delta = \mu_1 - \frac{\mu_2}{z - \mu_2 / z}, \text{ where } z = \left(\frac{\mu_3 + \sqrt{\mu_3^2 + 4\mu_2^3}}{2} \right)^{1/3}$$

$$F = M_1 - \Delta$$

$$V = \log\left(\frac{M_2 - \Delta^2 - 2\Delta F}{F^2} \right)$$

Therefore, we have

$$\begin{aligned}E[A_T] &= \Delta + F = \Delta + K_0 + F \\ E[A_T^2] &= \left(\Delta + K_0\right)^2 + 2\left(\Delta + K_0\right) F + F^2 e^V\end{aligned}$$

2.3.2 Arithmetic Average Rate Option Formula

We now assume $\ln A_T \propto N(\mu,\ Var)$, we then have $E[A_T^n] = e^{n\mu+0.5n^2 Var}$ for any integer $n \geq 1$

Or especially we have

$$E[A_T] = e^{\mu+0.5Var}$$

$$E[A_T^2] = e^{2\mu+2Var}$$

This implies that

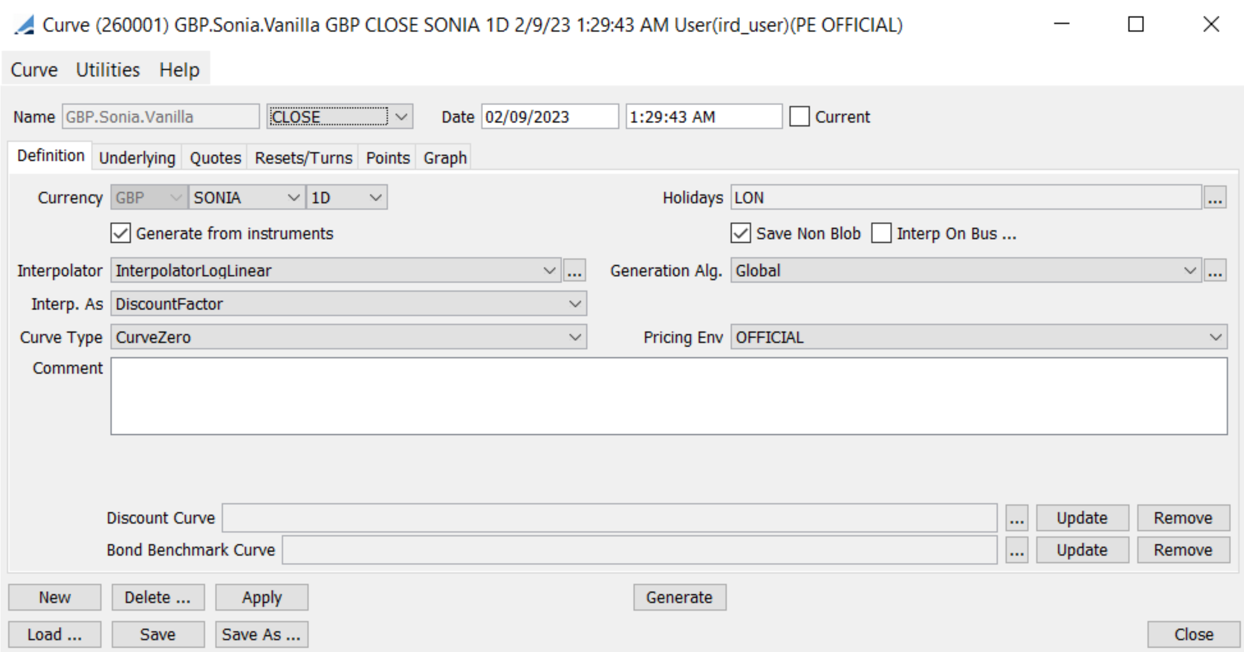
$$Var = \ln\left(\frac{E[A_T^2]}{(E[A_T])^2}\right)$$

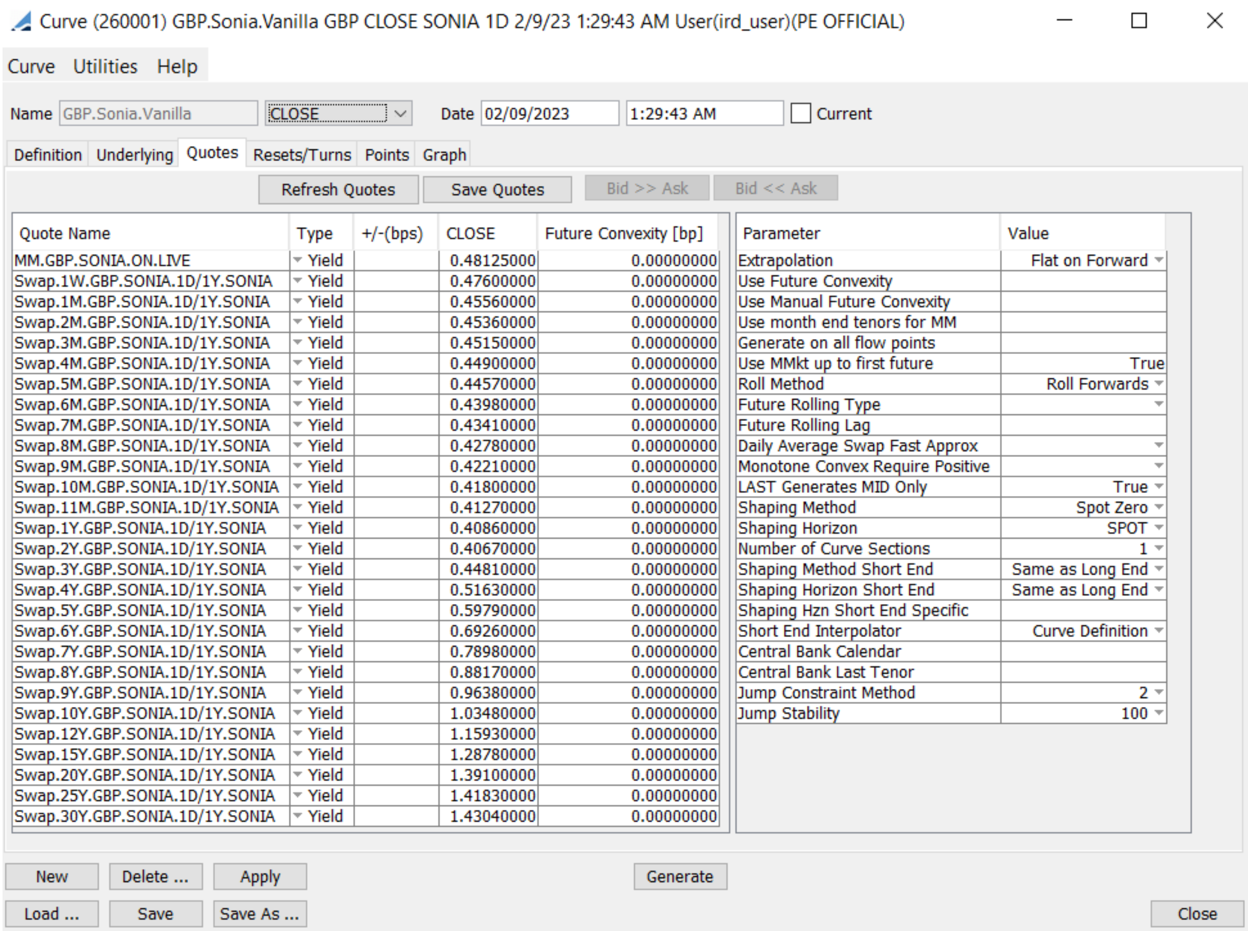
The Asian Option PV in quoting currency is then calculated by the Black-Scholes formula as follows:

$$AsianOption^Q = \phi Df^Q\left[E[A_T] * N\left(\phi\frac{\ln(E[A_T]/K)+0.5Var}{\sqrt{Var}}\right) - KN\left(\phi\frac{\ln(E[A_T]/K)-0.5Var}{\sqrt{Var}}\right)\right]$$

Section 3. Appendix A: Market Data Setup

3.1 The Primary Currency Discount Curve





Quote Name	Type	+/-(bps)	CLOSE	Future Convexity [bp]
MM.GBP.SONIA.ON.LIVE	Yield		0.48125000	0.00000000
Swap.1W.GBP.SONIA.1D/1Y.SONIA	Yield		0.47600000	0.00000000
Swap.1M.GBP.SONIA.1D/1Y.SONIA	Yield		0.45560000	0.00000000
Swap.2M.GBP.SONIA.1D/1Y.SONIA	Yield		0.45360000	0.00000000
Swap.3M.GBP.SONIA.1D/1Y.SONIA	Yield		0.45150000	0.00000000
Swap.4M.GBP.SONIA.1D/1Y.SONIA	Yield		0.44900000	0.00000000
Swap.5M.GBP.SONIA.1D/1Y.SONIA	Yield		0.44570000	0.00000000
Swap.6M.GBP.SONIA.1D/1Y.SONIA	Yield		0.43980000	0.00000000
Swap.7M.GBP.SONIA.1D/1Y.SONIA	Yield		0.43410000	0.00000000
Swap.8M.GBP.SONIA.1D/1Y.SONIA	Yield		0.42780000	0.00000000
Swap.9M.GBP.SONIA.1D/1Y.SONIA	Yield		0.42210000	0.00000000
Swap.10M.GBP.SONIA.1D/1Y.SONIA	Yield		0.41800000	0.00000000
Swap.11M.GBP.SONIA.1D/1Y.SONIA	Yield		0.41270000	0.00000000
Swap.1Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.40860000	0.00000000
Swap.2Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.40670000	0.00000000
Swap.3Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.44810000	0.00000000
Swap.4Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.51630000	0.00000000
Swap.5Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.59790000	0.00000000
Swap.6Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.69260000	0.00000000
Swap.7Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.78980000	0.00000000
Swap.8Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.88170000	0.00000000
Swap.9Y.GBP.SONIA.1D/1Y.SONIA	Yield		0.96380000	0.00000000
Swap.10Y.GBP.SONIA.1D/1Y.SONIA	Yield		1.03480000	0.00000000
Swap.12Y.GBP.SONIA.1D/1Y.SONIA	Yield		1.15930000	0.00000000
Swap.15Y.GBP.SONIA.1D/1Y.SONIA	Yield		1.28780000	0.00000000
Swap.20Y.GBP.SONIA.1D/1Y.SONIA	Yield		1.39100000	0.00000000
Swap.25Y.GBP.SONIA.1D/1Y.SONIA	Yield		1.41830000	0.00000000
Swap.30Y.GBP.SONIA.1D/1Y.SONIA	Yield		1.43040000	0.00000000

Parameter	Value
Extrapolation	Flat on Forward
Use Future Convexity	
Use Manual Future Convexity	
Use month end tenors for MM	
Generate on all flow points	
Use MMkt up to first future	True
Roll Method	Roll Forwards
Future Rolling Type	
Future Rolling Lag	
Daily Average Swap Fast Approx	
Monotone Convex Require Positive	
LAST Generates MID Only	True
Shaping Method	Spot Zero
Shaping Horizon	SPOT
Number of Curve Sections	1
Shaping Method Short End	Same as Long End
Shaping Horizon Short End	Same as Long End
Shaping Hzn Short End Specific	
Short End Interpolator	Curve Definition
Central Bank Calendar	
Central Bank Last Tenor	
Jump Constraint Method	2
Jump Stability	100

Curve (260001) GBP.Sonia.Vanilla GBP CLOSE SONIA 1D 2/9/23 1:29:43 AM User(ird_user)(PE OFFICIAL)

Curve Utilities Help

Name GBP.Sonia.Vanilla CLOSE Date 02/09/2023 1:29:43 AM Current

Definition Underlying Quotes Resets/Turns Points Graph

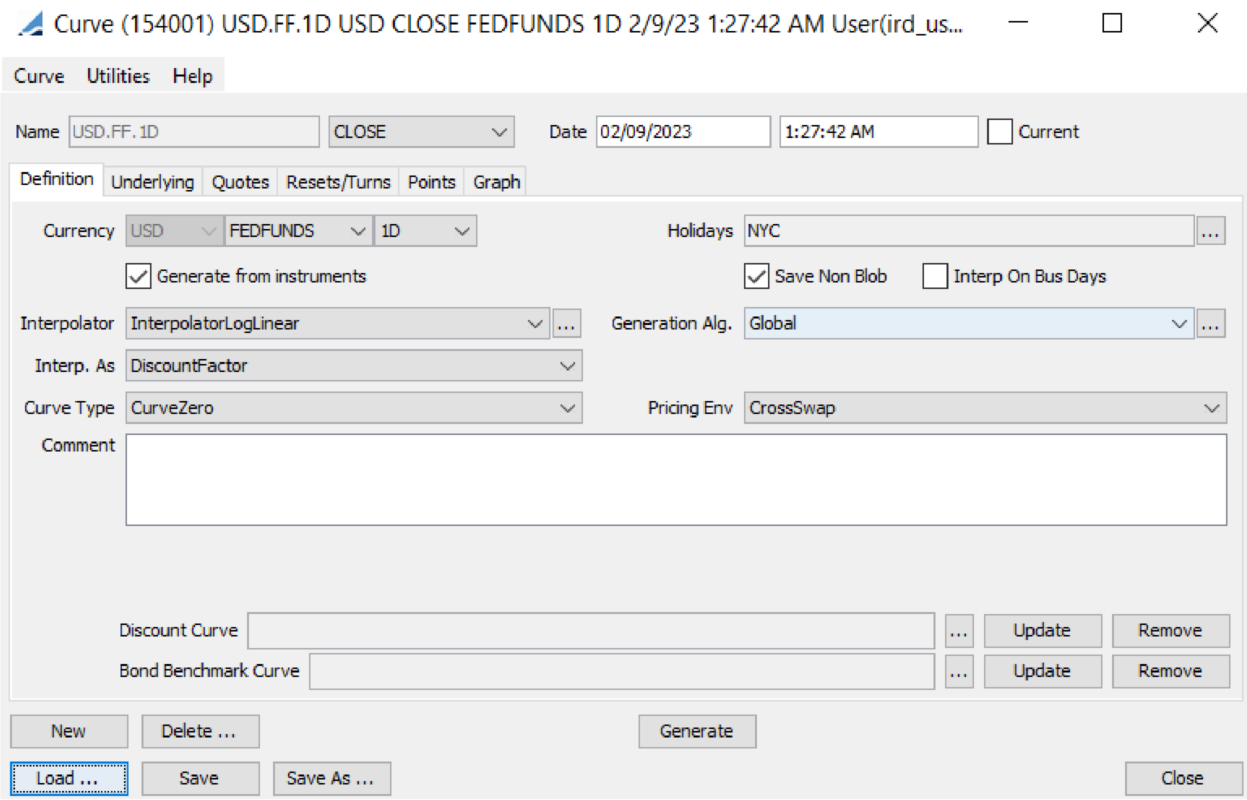
Base Curve:
Foreign Curve:

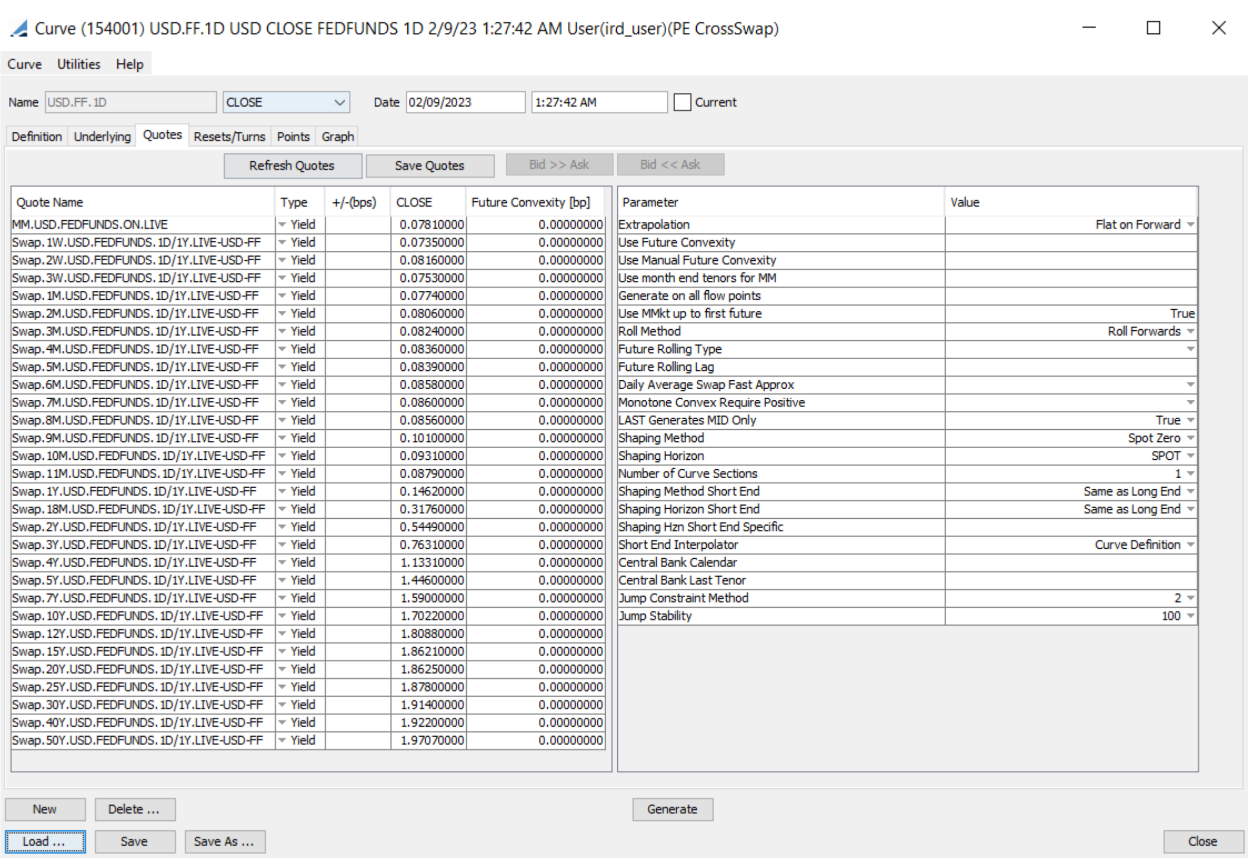
Insert
Append
Remove
Interpolate...
ACT/365
SA

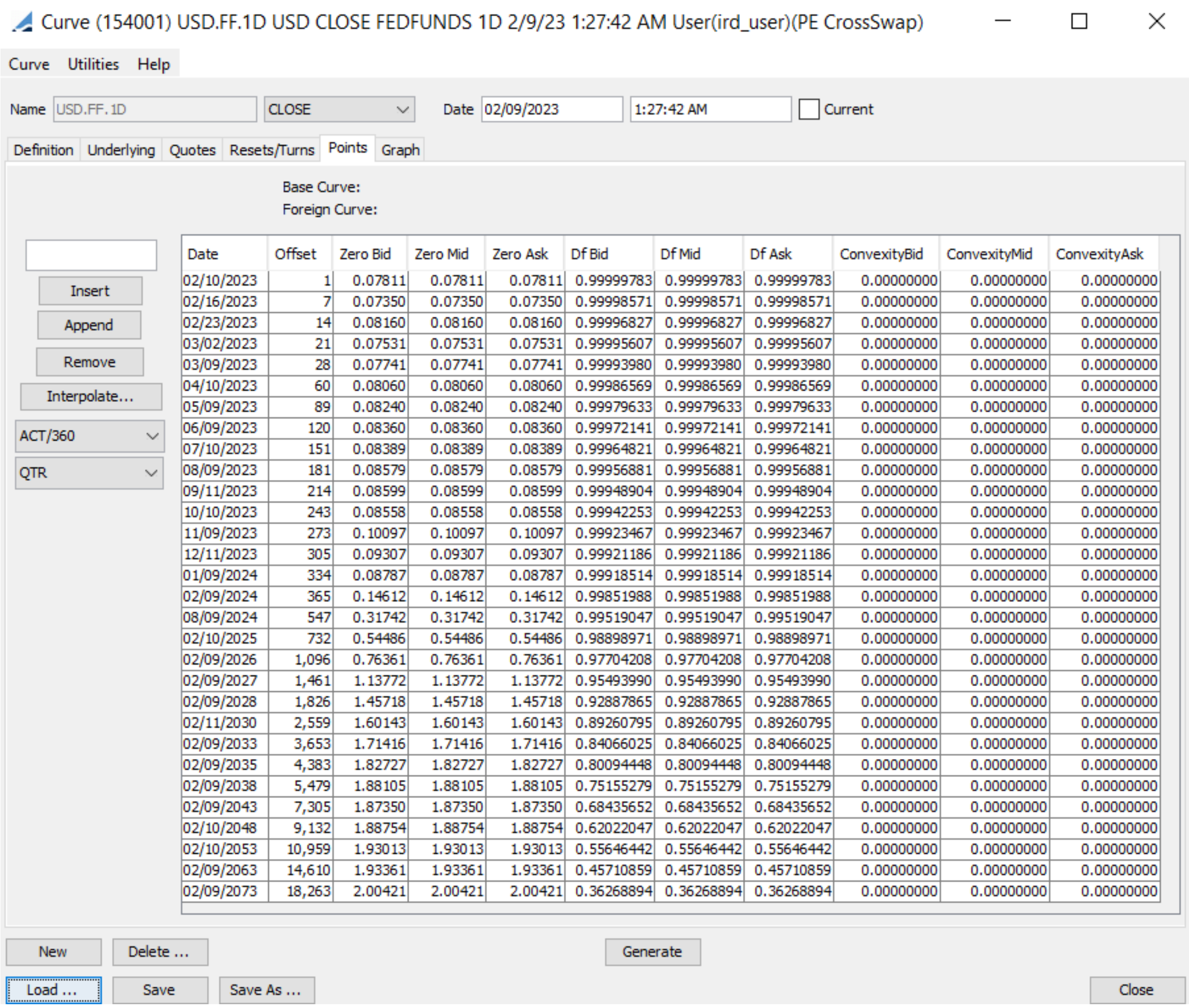
Date	Offset	Zero Bid	Zero Mid	Zero Ask	Df Bid	Df Mid	Df Ask	ConvexityBid	ConvexityMid	ConvexityAsk
02/10/2023	1	0.481826	0.481826	0.481826	0.99998682	0.99998682	0.99998682	0.00000000	0.00000000	0.00000000
02/17/2023	8	0.477218	0.477218	0.477218	0.99989553	0.99989553	0.99989553	0.00000000	0.00000000	0.00000000
03/10/2023	29	0.456929	0.456929	0.456929	0.99963744	0.99963744	0.99963744	0.00000000	0.00000000	0.00000000
04/12/2023	62	0.454394	0.454394	0.454394	0.99922933	0.99922933	0.99922933	0.00000000	0.00000000	0.00000000
05/10/2023	90	0.452098	0.452098	0.452098	0.99888712	0.99888712	0.99888712	0.00000000	0.00000000	0.00000000
06/12/2023	123	0.449318	0.449318	0.449318	0.99848870	0.99848870	0.99848870	0.00000000	0.00000000	0.00000000
07/11/2023	152	0.446143	0.446143	0.446143	0.99814588	0.99814588	0.99814588	0.00000000	0.00000000	0.00000000
08/10/2023	182	0.440137	0.440137	0.440137	0.99781016	0.99781016	0.99781016	0.00000000	0.00000000	0.00000000
09/12/2023	215	0.434326	0.434326	0.434326	0.99744768	0.99744768	0.99744768	0.00000000	0.00000000	0.00000000
10/10/2023	243	0.427950	0.427950	0.427950	0.99715800	0.99715800	0.99715800	0.00000000	0.00000000	0.00000000
11/10/2023	274	0.422166	0.422166	0.422166	0.99683921	0.99683921	0.99683921	0.00000000	0.00000000	0.00000000
12/12/2023	306	0.417978	0.417978	0.417978	0.99650563	0.99650563	0.99650563	0.00000000	0.00000000	0.00000000
01/10/2024	335	0.412610	0.412610	0.412610	0.99622407	0.99622407	0.99622407	0.00000000	0.00000000	0.00000000
02/12/2024	368	0.408191	0.408191	0.408191	0.99589718	0.99589718	0.99589718	0.00000000	0.00000000	0.00000000
02/11/2025	733	0.406299	0.406299	0.406299	0.99188204	0.99188204	0.99188204	0.00000000	0.00000000	0.00000000
02/10/2026	1,097	0.447756	0.447756	0.447756	0.98664777	0.98664777	0.98664777	0.00000000	0.00000000	0.00000000
02/10/2027	1,462	0.516258	0.516258	0.516258	0.97955984	0.97955984	0.97955984	0.00000000	0.00000000	0.00000000
02/10/2028	1,827	0.598533	0.598533	0.598533	0.97052830	0.97052830	0.97052830	0.00000000	0.00000000	0.00000000
02/12/2029	2,195	0.694942	0.694942	0.694942	0.95913897	0.95913897	0.95913897	0.00000000	0.00000000	0.00000000
02/12/2030	2,560	0.793435	0.793435	0.793435	0.94597509	0.94597509	0.94597509	0.00000000	0.00000000	0.00000000
02/11/2031	2,924	0.887762	0.887762	0.887762	0.93149832	0.93149832	0.93149832	0.00000000	0.00000000	0.00000000
02/10/2032	3,288	0.972558	0.972558	0.972558	0.91631249	0.91631249	0.91631249	0.00000000	0.00000000	0.00000000
02/10/2033	3,654	1.046299	1.046299	1.046299	0.90080041	0.90080041	0.90080041	0.00000000	0.00000000	0.00000000
02/12/2035	4,386	1.177171	1.177171	1.177171	0.86845514	0.86845514	0.86845514	0.00000000	0.00000000	0.00000000
02/10/2038	5,480	1.313081	1.313081	1.313081	0.82160322	0.82160322	0.82160322	0.00000000	0.00000000	0.00000000
02/10/2043	7,306	1.422126	1.422126	1.422126	0.75302888	0.75302888	0.75302888	0.00000000	0.00000000	0.00000000
02/11/2048	9,133	1.447096	1.447096	1.447096	0.69712712	0.69712712	0.69712712	0.00000000	0.00000000	0.00000000
02/11/2053	10,960	1.456281	1.456281	1.456281	0.64681243	0.64681243	0.64681243	0.00000000	0.00000000	0.00000000

New Delete ... Apply Generate
Load ... Save Save As ... Close

3.2 The Quoting USD Discount Curve

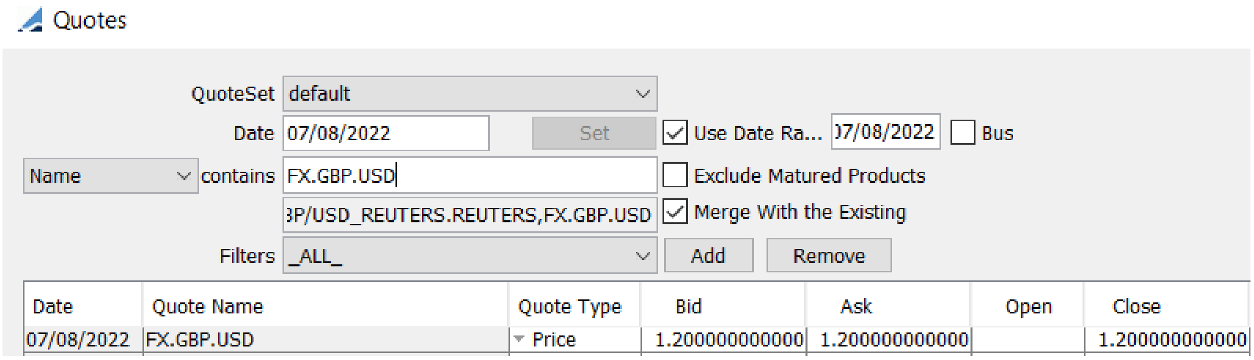




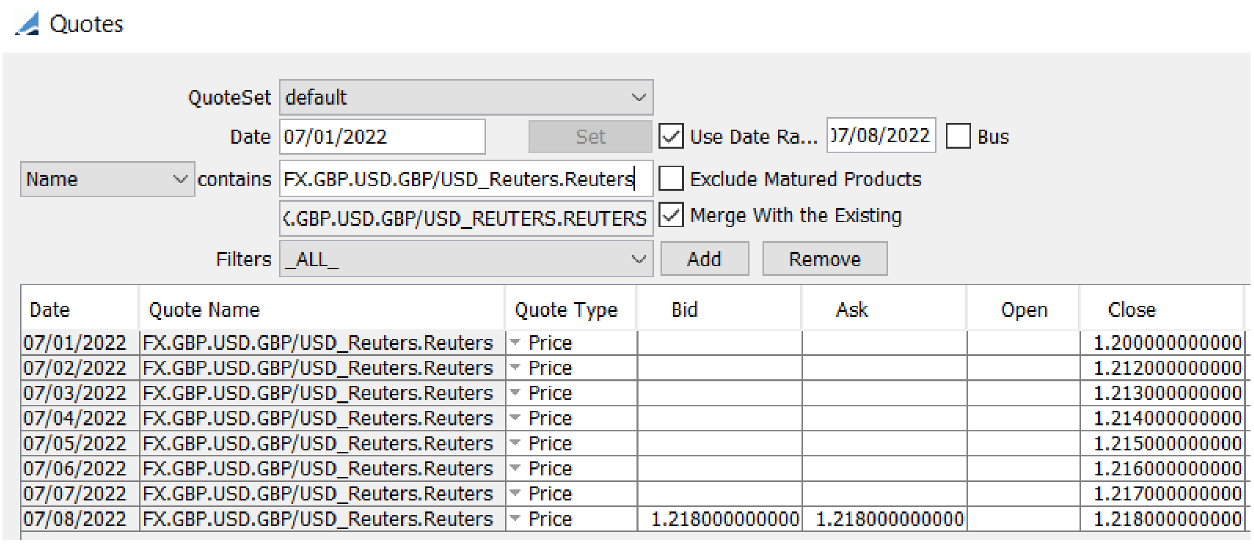


Date	Offset	Zero Bid	Zero Mid	Zero Ask	Df Bid	Df Mid	Df Ask	ConvexityBid	ConvexityMid	ConvexityAsk
02/10/2023	1	0.07811	0.07811	0.07811	0.99999783	0.99999783	0.99999783	0.00000000	0.00000000	0.00000000
02/16/2023	7	0.07350	0.07350	0.07350	0.99998571	0.99998571	0.99998571	0.00000000	0.00000000	0.00000000
02/23/2023	14	0.08160	0.08160	0.08160	0.99996827	0.99996827	0.99996827	0.00000000	0.00000000	0.00000000
03/02/2023	21	0.07531	0.07531	0.07531	0.99995607	0.99995607	0.99995607	0.00000000	0.00000000	0.00000000
03/09/2023	28	0.07741	0.07741	0.07741	0.99993980	0.99993980	0.99993980	0.00000000	0.00000000	0.00000000
04/10/2023	60	0.08060	0.08060	0.08060	0.99986569	0.99986569	0.99986569	0.00000000	0.00000000	0.00000000
05/09/2023	89	0.08240	0.08240	0.08240	0.99979633	0.99979633	0.99979633	0.00000000	0.00000000	0.00000000
06/09/2023	120	0.08360	0.08360	0.08360	0.99972141	0.99972141	0.99972141	0.00000000	0.00000000	0.00000000
07/10/2023	151	0.08389	0.08389	0.08389	0.99964821	0.99964821	0.99964821	0.00000000	0.00000000	0.00000000
08/09/2023	181	0.08579	0.08579	0.08579	0.99956881	0.99956881	0.99956881	0.00000000	0.00000000	0.00000000
09/11/2023	214	0.08599	0.08599	0.08599	0.99948904	0.99948904	0.99948904	0.00000000	0.00000000	0.00000000
10/10/2023	243	0.08558	0.08558	0.08558	0.99942253	0.99942253	0.99942253	0.00000000	0.00000000	0.00000000
11/09/2023	273	0.10097	0.10097	0.10097	0.99923467	0.99923467	0.99923467	0.00000000	0.00000000	0.00000000
12/11/2023	305	0.09307	0.09307	0.09307	0.99921186	0.99921186	0.99921186	0.00000000	0.00000000	0.00000000
01/09/2024	334	0.08787	0.08787	0.08787	0.99918514	0.99918514	0.99918514	0.00000000	0.00000000	0.00000000
02/09/2024	365	0.14612	0.14612	0.14612	0.99851988	0.99851988	0.99851988	0.00000000	0.00000000	0.00000000
08/09/2024	547	0.31742	0.31742	0.31742	0.99519047	0.99519047	0.99519047	0.00000000	0.00000000	0.00000000
02/10/2025	732	0.54486	0.54486	0.54486	0.98898971	0.98898971	0.98898971	0.00000000	0.00000000	0.00000000
02/09/2026	1,096	0.76361	0.76361	0.76361	0.97704208	0.97704208	0.97704208	0.00000000	0.00000000	0.00000000
02/09/2027	1,461	1.13772	1.13772	1.13772	0.95493990	0.95493990	0.95493990	0.00000000	0.00000000	0.00000000
02/09/2028	1,826	1.45718	1.45718	1.45718	0.92887865	0.92887865	0.92887865	0.00000000	0.00000000	0.00000000
02/11/2030	2,559	1.60143	1.60143	1.60143	0.89260795	0.89260795	0.89260795	0.00000000	0.00000000	0.00000000
02/09/2033	3,653	1.71416	1.71416	1.71416	0.84066025	0.84066025	0.84066025	0.00000000	0.00000000	0.00000000
02/09/2035	4,383	1.82727	1.82727	1.82727	0.80094448	0.80094448	0.80094448	0.00000000	0.00000000	0.00000000
02/09/2038	5,479	1.88105	1.88105	1.88105	0.75155279	0.75155279	0.75155279	0.00000000	0.00000000	0.00000000
02/09/2043	7,305	1.87350	1.87350	1.87350	0.68435652	0.68435652	0.68435652	0.00000000	0.00000000	0.00000000
02/10/2048	9,132	1.88754	1.88754	1.88754	0.62022047	0.62022047	0.62022047	0.00000000	0.00000000	0.00000000
02/10/2053	10,959	1.93013	1.93013	1.93013	0.55646442	0.55646442	0.55646442	0.00000000	0.00000000	0.00000000
02/09/2063	14,610	1.93361	1.93361	1.93361	0.45710859	0.45710859	0.45710859	0.00000000	0.00000000	0.00000000
02/09/2073	18,263	2.00421	2.00421	2.00421	0.36268894	0.36268894	0.36268894	0.00000000	0.00000000	0.00000000

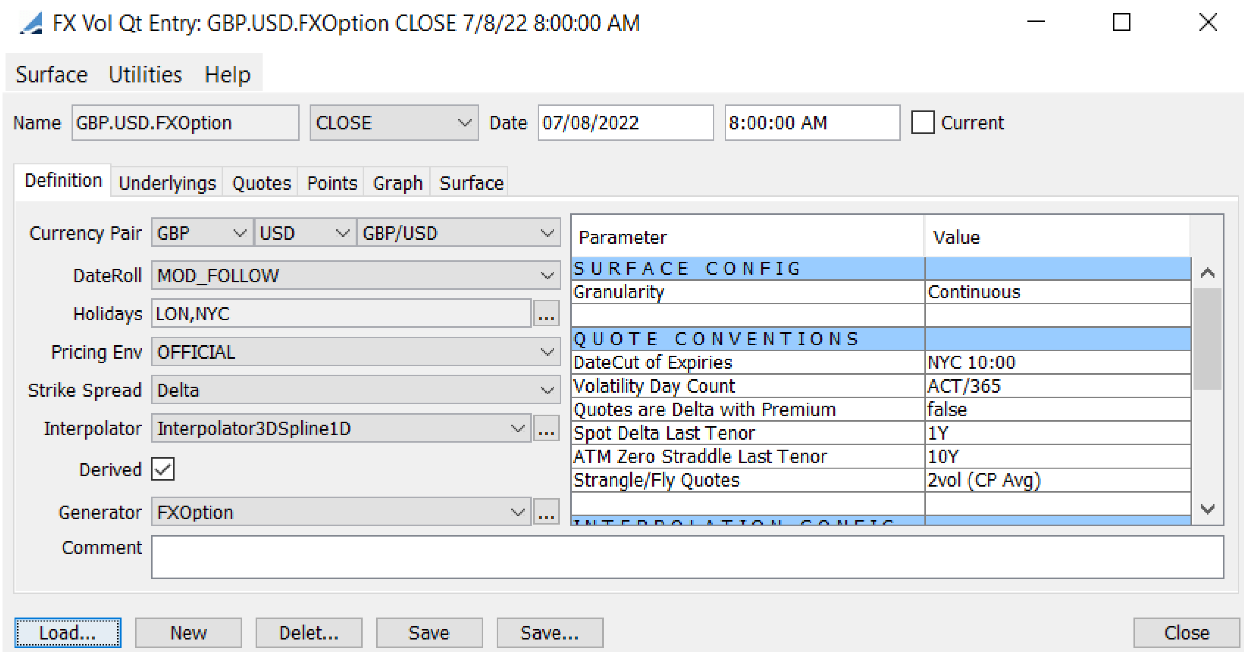
3.3 The FX Spot Quotes

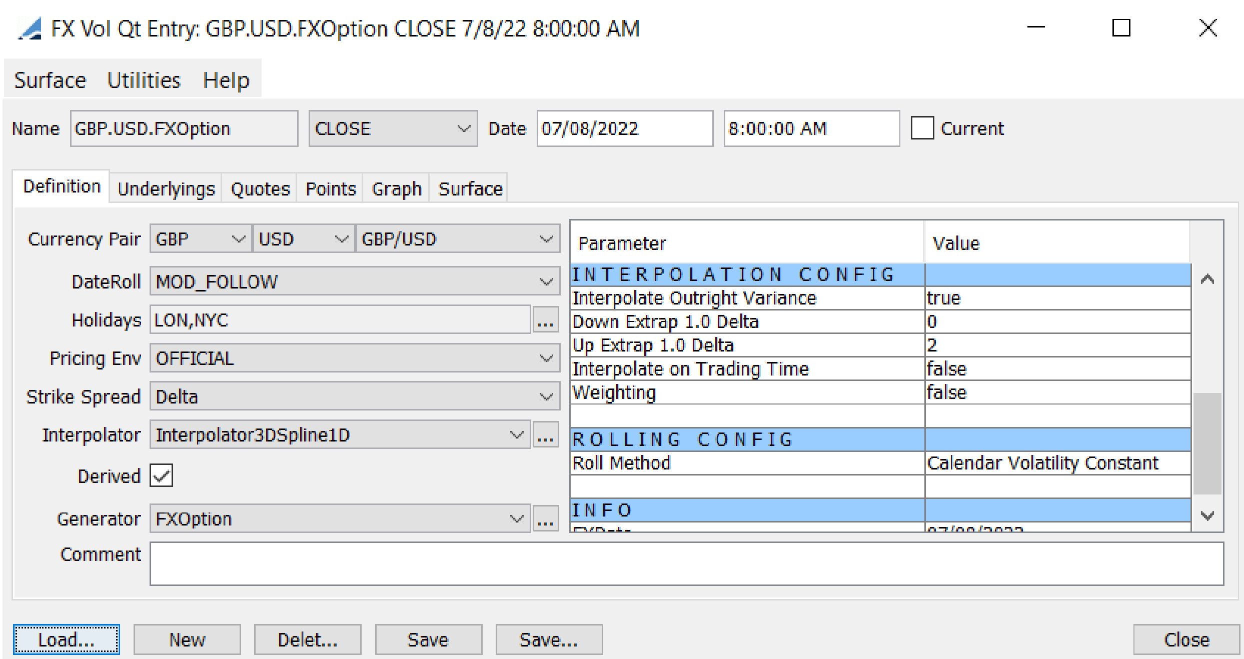


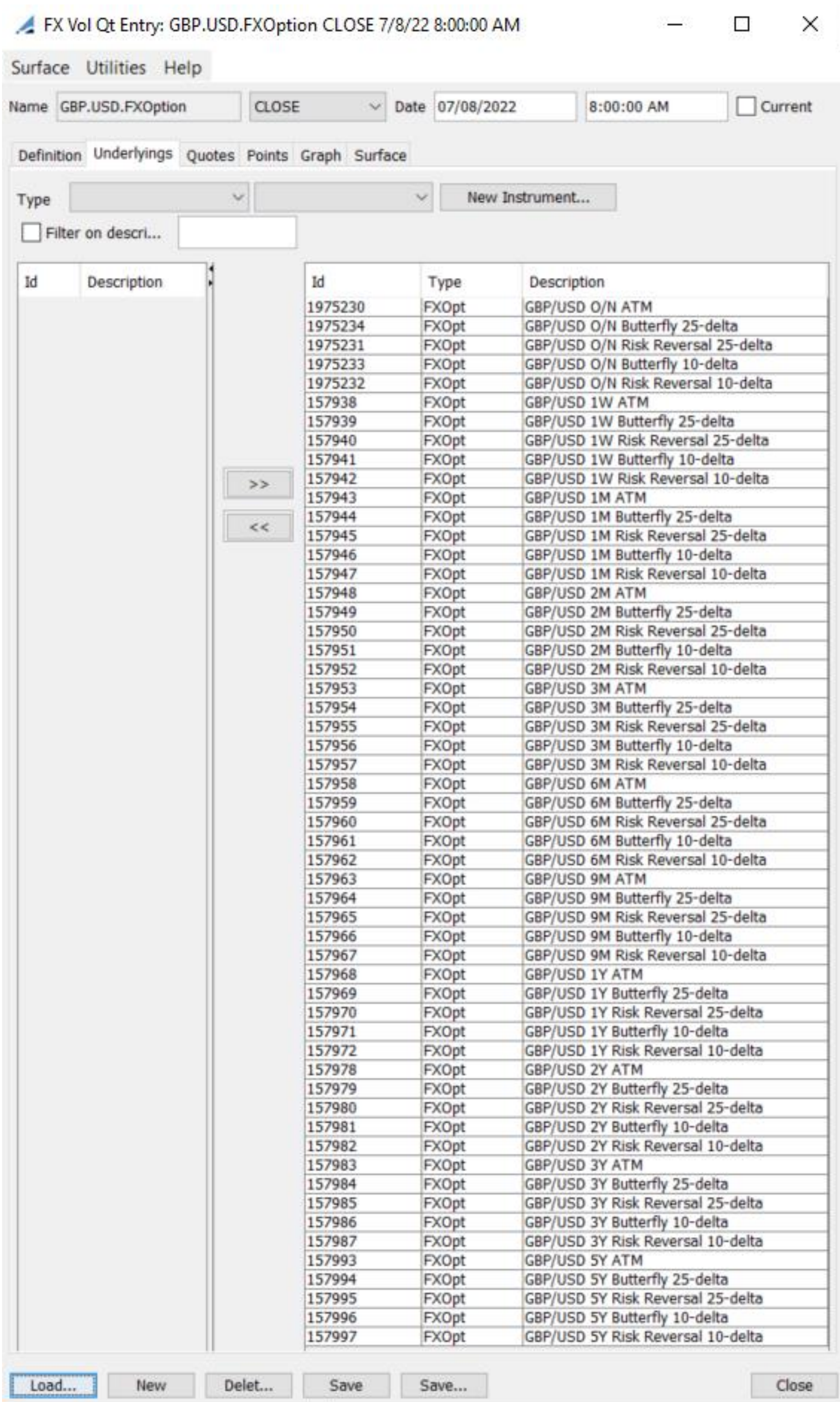
3.4 The FX Rate Fixing Quotes



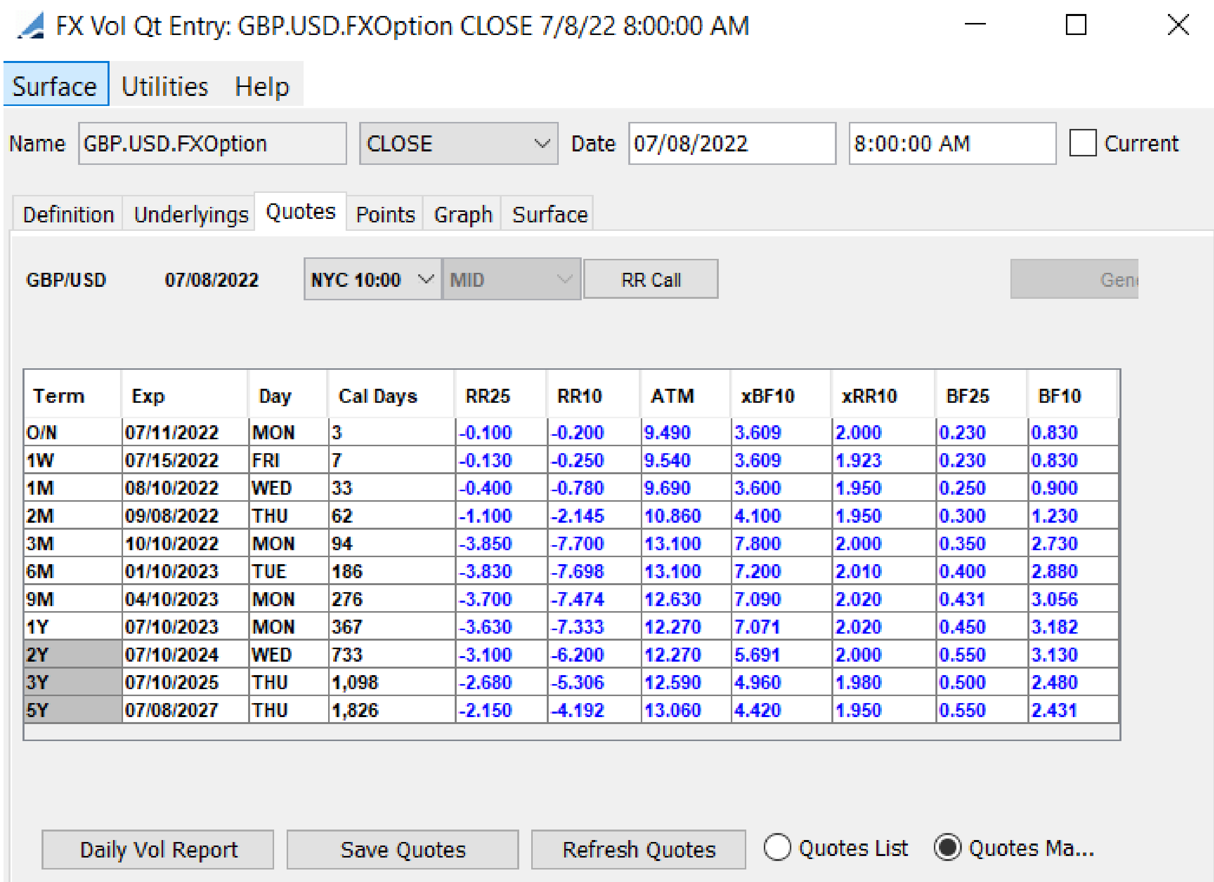
3.5 The GBP/USD Volatility Surface



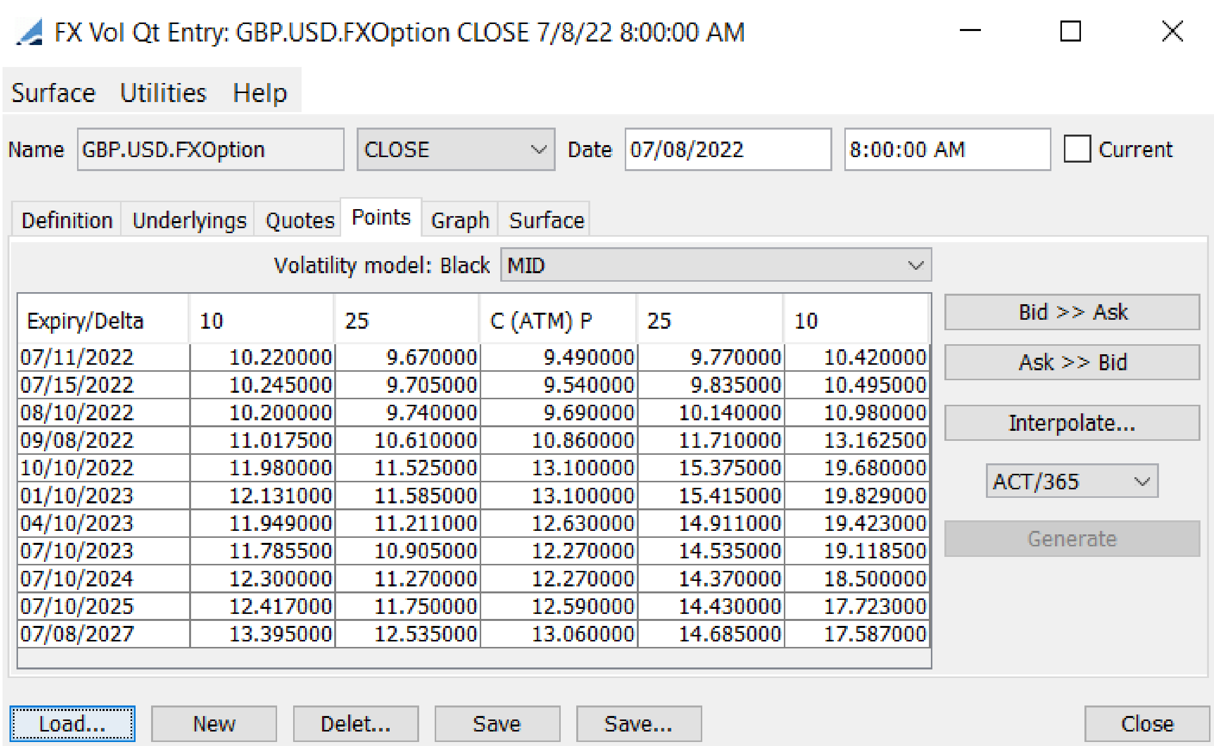




Id	Type	Description
1975230	FXOpt	GBP/USD O/N ATM
1975234	FXOpt	GBP/USD O/N Butterfly 25-delta
1975231	FXOpt	GBP/USD O/N Risk Reversal 25-delta
1975233	FXOpt	GBP/USD O/N Butterfly 10-delta
1975232	FXOpt	GBP/USD O/N Risk Reversal 10-delta
157938	FXOpt	GBP/USD 1W ATM
157939	FXOpt	GBP/USD 1W Butterfly 25-delta
157940	FXOpt	GBP/USD 1W Risk Reversal 25-delta
157941	FXOpt	GBP/USD 1W Butterfly 10-delta
157942	FXOpt	GBP/USD 1W Risk Reversal 10-delta
157943	FXOpt	GBP/USD 1M ATM
157944	FXOpt	GBP/USD 1M Butterfly 25-delta
157945	FXOpt	GBP/USD 1M Risk Reversal 25-delta
157946	FXOpt	GBP/USD 1M Butterfly 10-delta
157947	FXOpt	GBP/USD 1M Risk Reversal 10-delta
157948	FXOpt	GBP/USD 2M ATM
157949	FXOpt	GBP/USD 2M Butterfly 25-delta
157950	FXOpt	GBP/USD 2M Risk Reversal 25-delta
157951	FXOpt	GBP/USD 2M Butterfly 10-delta
157952	FXOpt	GBP/USD 2M Risk Reversal 10-delta
157953	FXOpt	GBP/USD 3M ATM
157954	FXOpt	GBP/USD 3M Butterfly 25-delta
157955	FXOpt	GBP/USD 3M Risk Reversal 25-delta
157956	FXOpt	GBP/USD 3M Butterfly 10-delta
157957	FXOpt	GBP/USD 3M Risk Reversal 10-delta
157958	FXOpt	GBP/USD 6M ATM
157959	FXOpt	GBP/USD 6M Butterfly 25-delta
157960	FXOpt	GBP/USD 6M Risk Reversal 25-delta
157961	FXOpt	GBP/USD 6M Butterfly 10-delta
157962	FXOpt	GBP/USD 6M Risk Reversal 10-delta
157963	FXOpt	GBP/USD 9M ATM
157964	FXOpt	GBP/USD 9M Butterfly 25-delta
157965	FXOpt	GBP/USD 9M Risk Reversal 25-delta
157966	FXOpt	GBP/USD 9M Butterfly 10-delta
157967	FXOpt	GBP/USD 9M Risk Reversal 10-delta
157968	FXOpt	GBP/USD 1Y ATM
157969	FXOpt	GBP/USD 1Y Butterfly 25-delta
157970	FXOpt	GBP/USD 1Y Risk Reversal 25-delta
157971	FXOpt	GBP/USD 1Y Butterfly 10-delta
157972	FXOpt	GBP/USD 1Y Risk Reversal 10-delta
157978	FXOpt	GBP/USD 2Y ATM
157979	FXOpt	GBP/USD 2Y Butterfly 25-delta
157980	FXOpt	GBP/USD 2Y Risk Reversal 25-delta
157981	FXOpt	GBP/USD 2Y Butterfly 10-delta
157982	FXOpt	GBP/USD 2Y Risk Reversal 10-delta
157983	FXOpt	GBP/USD 3Y ATM
157984	FXOpt	GBP/USD 3Y Butterfly 25-delta
157985	FXOpt	GBP/USD 3Y Risk Reversal 25-delta
157986	FXOpt	GBP/USD 3Y Butterfly 10-delta
157987	FXOpt	GBP/USD 3Y Risk Reversal 10-delta
157993	FXOpt	GBP/USD 5Y ATM
157994	FXOpt	GBP/USD 5Y Butterfly 25-delta
157995	FXOpt	GBP/USD 5Y Risk Reversal 25-delta
157996	FXOpt	GBP/USD 5Y Butterfly 10-delta
157997	FXOpt	GBP/USD 5Y Risk Reversal 10-delta

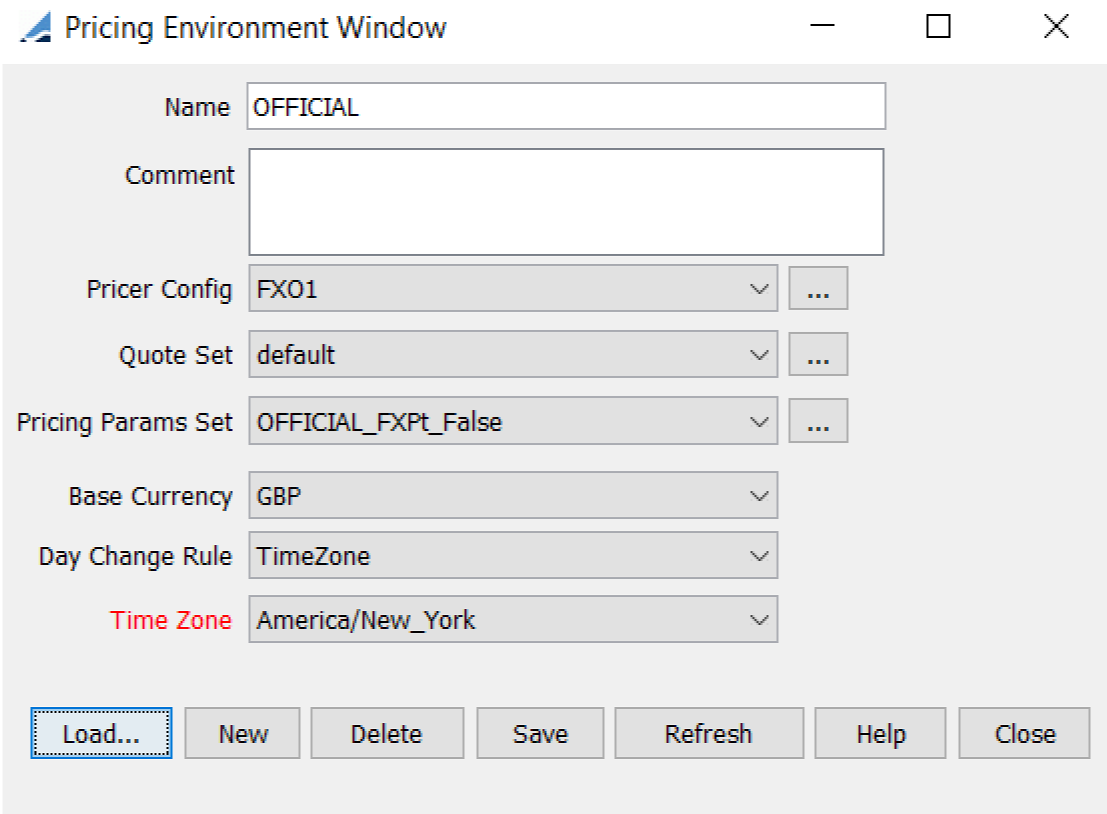


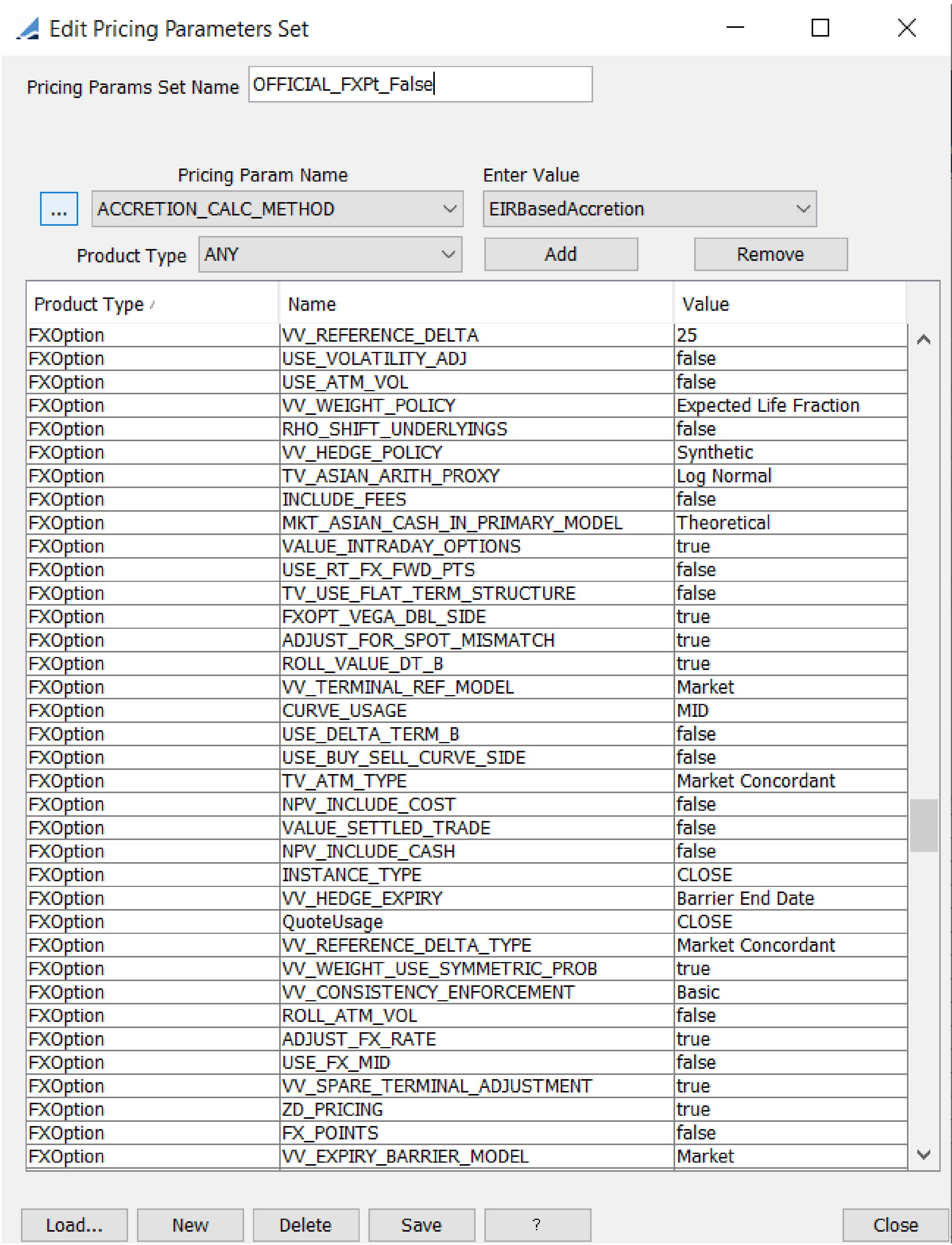
Term	Exp	Day	Cal Days	RR25	RR10	ATM	xBF10	xRR10	BF25	BF10
O/N	07/11/2022	MON	3	-0.100	-0.200	9.490	3.609	2.000	0.230	0.830
1W	07/15/2022	FRI	7	-0.130	-0.250	9.540	3.609	1.923	0.230	0.830
1M	08/10/2022	WED	33	-0.400	-0.780	9.690	3.600	1.950	0.250	0.900
2M	09/08/2022	THU	62	-1.100	-2.145	10.860	4.100	1.950	0.300	1.230
3M	10/10/2022	MON	94	-3.850	-7.700	13.100	7.800	2.000	0.350	2.730
6M	01/10/2023	TUE	186	-3.830	-7.698	13.100	7.200	2.010	0.400	2.880
9M	04/10/2023	MON	276	-3.700	-7.474	12.630	7.090	2.020	0.431	3.056
1Y	07/10/2023	MON	367	-3.630	-7.333	12.270	7.071	2.020	0.450	3.182
2Y	07/10/2024	WED	733	-3.100	-6.200	12.270	5.691	2.000	0.550	3.130
3Y	07/10/2025	THU	1,098	-2.680	-5.306	12.590	4.960	1.980	0.500	2.480
5Y	07/08/2027	THU	1,826	-2.150	-4.192	13.060	4.420	1.950	0.550	2.431



Expiry/Delta	10	25	C (ATM) P	25	10
07/11/2022	10.220000	9.670000	9.490000	9.770000	10.420000
07/15/2022	10.245000	9.705000	9.540000	9.835000	10.495000
08/10/2022	10.200000	9.740000	9.690000	10.140000	10.980000
09/08/2022	11.017500	10.610000	10.860000	11.710000	13.162500
10/10/2022	11.980000	11.525000	13.100000	15.375000	19.680000
01/10/2023	12.131000	11.585000	13.100000	15.415000	19.829000
04/10/2023	11.949000	11.211000	12.630000	14.911000	19.423000
07/10/2023	11.785500	10.905000	12.270000	14.535000	19.118500
07/10/2024	12.300000	11.270000	12.270000	14.370000	18.500000
07/10/2025	12.417000	11.750000	12.590000	14.430000	17.723000
07/08/2027	13.395000	12.535000	13.060000	14.685000	17.587000

3.6 The Pricing Environment





Product Type	Name	Value
FXOption	VV_REFERENCE_DELTA	25
FXOption	USE_VOLATILITY_ADJ	false
FXOption	USE_ATM_VOL	false
FXOption	VV_WEIGHT_POLICY	Expected Life Fraction
FXOption	RHO_SHIFT_UNDERLYINGS	false
FXOption	VV_HEDGE_POLICY	Synthetic
FXOption	TV_ASIAN_ARITH_PROXY	Log Normal
FXOption	INCLUDE_FEES	false
FXOption	MKT_ASIAN_CASH_IN_PRIMARY_MODEL	Theoretical
FXOption	VALUE_INTRADAY_OPTIONS	true
FXOption	USE_RT_FX_FWD_PTS	false
FXOption	TV_USE_FLAT_TERM_STRUCTURE	false
FXOption	FXOPT_VEGA_DBL_SIDE	true
FXOption	ADJUST_FOR_SPOT_MISMATCH	true
FXOption	ROLL_VALUE_DT_B	true
FXOption	VV_TERMINAL_REF_MODEL	Market
FXOption	CURVE_USAGE	MID
FXOption	USE_DELTA_TERM_B	false
FXOption	USE_BUY_SELL_CURVE_SIDE	false
FXOption	TV_ATM_TYPE	Market Concordant
FXOption	NPV_INCLUDE_COST	false
FXOption	VALUE_SETTLED_TRADE	false
FXOption	NPV_INCLUDE_CASH	false
FXOption	INSTANCE_TYPE	CLOSE
FXOption	VV_HEDGE_EXPIRY	Barrier End Date
FXOption	QuoteUsage	CLOSE
FXOption	VV_REFERENCE_DELTA_TYPE	Market Concordant
FXOption	VV_WEIGHT_USE_SYMMETRIC_PROB	true
FXOption	VV_CONSISTENCY_ENFORCEMENT	Basic
FXOption	ROLL_ATM_VOL	false
FXOption	ADJUST_FX_RATE	true
FXOption	USE_FX_MID	false
FXOption	VV_SPARE_TERMINAL_ADJUSTMENT	true
FXOption	ZD_PRICING	true
FXOption	FX_POINTS	false
FXOption	VV_EXPIRY_BARRIER_MODEL	Market

3.7 The Test Versions

-user ird_user -password calypso -env v17

More Info

Installed Patches | Classpath

No hotfix information available.

Module	CI Project	Version	Build Date
calypso	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-acc-pl-reconciliation	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-accessperm-ext	CALYPSO-ACCESSPERM-EXT-MULTIBRANCH/master	3.0.1	2023-04-11 00:40:47 PDT
calypso-analysis-metadata	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-analysisprovider	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-analytics-api	CALYPSO-ANALYTICS-API-MULTIBRANCH/master	4.2.3	2023-05-25 06:38:25 PDT
calypso-appkit	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-audit-recorder	MICROSERVICES-FRAMEWORK-MULTIBRANCH/maintena…	10.2.0	2023-10-05 05:35:24 PDT
calypso-autodiff	CALIB-MULTIBRANCH/CALIB_401-8_PATCHES	401.8.1-17.0.0.0	2023-10-09 23:59:19 PDT
calypso-bean-core	MICROSERVICES-FRAMEWORK-MULTIBRANCH/maintena…	10.2.0	2023-10-05 05:35:24 PDT
calypso-bo-messaging-core	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-mx-…	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-mx-…	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-mx-…	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-mx-…	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-mx-…	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-mx-jd	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-mx-…	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-messaging-realiti	BO-MESSAGING-MULTIBRANCH/maintenance17	2.25.0-17.0.0.0	2023-10-11 08:25:49 PDT
calypso-bo-service	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-bodashboard-beans	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-bodashboard-core	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-bondexoticnote	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-bows	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-calculation-server	CORE-PIPELINE-MULTIBRANCH/CORE-FRONTOFFICE_17	17.23.12.1-FRONTOFFICE_17-SNAPSHOT	2023-11-09 05:02:08 PST
calypso-calib	CALIB-MULTIBRANCH/CALIB_401-8_PATCHES	401.8.1-17.0.0.0	2023-10-09 23:59:19 PDT

More Info

Installed Patches | Classpath

No hotfix information available.

Module	CI Project	Version	Build Date	Revision	Build
calypso-analytics-api	CALYPSO-ANALYTICS-API-MULTIBRANCH/m...	4.1.0	2022-11-01 06:...	ce3f43a78b3...	105
calypso-pricingscript-api	CALYPSO-PRICINGSCRIPT-API-MULTIBRAN...	2.0.1	2022-01-07 08:...	9cd8e99714...	8
calypso-core	CALYPSO-CORE-MULTIBRANCH/CALYPSO-C...	13.10.6	2022-12-21 01:...	9a33a202a4...	17
calypso-healthcheck	HEALTHCHECK-MULTIBRANCH/HEALTHCHE...	4.2.2	2022-11-18 01:...	a889e7b69c...	9
calypso-hibernate-core	HIBERNATE-CORE-MULTIBRANCH/master	5.1.0	2022-05-10 02:...	52985e2b73...	57
calypso-accessperm-ext	CALYPSO-ACCESSPERM-EXT-MULTIBRANC...	2.0.1	2021-11-26 09:...	370f80b1388...	72
calypso-logging	CALYPSO-LOGGING-MULTIBRANCH/master	9.4.0	2022-11-14 01:...	56cc7a4d99f...	187
calypso-infosec	CALYPSO-INFOSEC-MULTIBRANCH/CALYPS...	5.0.8	2022-10-07 01:...	a210eaa689...	87
calypso-infosec-xstream	CALYPSO-INFOSEC-MULTIBRANCH/CALYPS...	5.0.8	2022-10-07 01:...	a210eaa689...	87
calypso-infosec-jdom	CALYPSO-INFOSEC-MULTIBRANCH/CALYPS...	5.0.8	2022-10-07 01:...	a210eaa689...	87
calypso-infosec-jdom2	CALYPSO-INFOSEC-MULTIBRANCH/CALYPS...	5.0.8	2022-10-07 01:...	a210eaa689...	87
calypso-infosec-dom4j	CALYPSO-INFOSEC-MULTIBRANCH/CALYPS...	5.0.8	2022-10-07 01:...	a210eaa689...	87
calypso-random	CALYPSO-RANDOM-MULTIBRANCH/master	3.4.0	2022-09-09 05:...	97689b2011...	95
calypso-swift-xml	SWIFT-XML-MULTIBRANCH/SWIFT-XML_3-...	3.0.1	2021-12-01 04:...	6716290ede...	5
calypso-jaxb-impl-runtime	CALYPSO-JAXB-IMPL-RUNTIME-MULTIBRAN...	3.0.0	2021-10-25 21:...	606dfbffe7f0...	12
calypso-persistence-service	PERSISTENCE-SERVICE-MULTIBRANCH/ma...	5.1.0	2022-05-10 06:...	30892d933a...	136
calypso-sqlinputvalidator	SQLINPUTVALIDATOR_TRUNK	2.0.0	2015-08-19 14:...	234714	177
calypso-foundation-api	CALYPSO-FOUNDATION-MULTIBRANCH/CAL...	3.3.2	2022-11-16 01:...	ec6676f9c0d...	8
calypso-foundation-impl	CALYPSO-FOUNDATION-MULTIBRANCH/CAL...	3.3.2	2022-11-16 01:...	ec6676f9c0d...	8
calypso-jboss-managem...	CALYPSO-EXTENSION-JBOSS-MULTIBRANC...	10.0.2	2021-12-23 03:...	894127c3d4...	8
calypso-weblogic-client-c...	CALYPSO-EXTENSION-WEBLOGIC_1-0-2	1.0.2	2013-11-14_10...	168255	1
calypso-jboss-client-cont...	CALYPSO-EXTENSION-JBOSS-MULTIBRANC...	10.0.2	2021-12-23 03:...	894127c3d4...	8
calypso-executesql	EXECUTESQL-MULTIBRANCH/EXECUTESQL...	6.5.1-17.0.0.0	2022-09-29 05:...	d903403e55...	3
calypso-schemer	SCHEMER-MULTIBRANCH/master	7.3.0	2022-11-14 03:...	6e3574547d...	161
calypso-scheduling-engin...	SCHEDULING-ENGINE-MULTIBRANCH/SCHE...	8.1.1-17.0.0.0	2022-11-16 05:...	7f4b4795afb...	3
calypso-elasticsearch-core	CALYPSO-DEVOPSCENTER-MULTIBRANCH/...	5.11.9	2022-12-13 14:...	b0702d60d2...	44
calypso-elasticsearch-ap...	CALYPSO-DEVOPSCENTER-MULTIBRANCH/...	5.11.9	2022-12-13 14:...	b0702d60d2...	44
calypso-bean-core	MICROSERVICES-FRAMEWORK-MULTIBRAN...	9.12.2	2022-12-07 14:...	504f21b67f1...	2351
calypso-microservice-client	MICROSERVICES-FRAMEWORK-MULTIBRAN...	9.12.2	2022-12-07 14:...	504f21b67f1...	2351
calypso-persistence-core...	MICROSERVICES-FRAMEWORK-MULTIBRAN...	9.12.2	2022-12-07 14:...	504f21b67f1...	2351
calypso-audit-recorder	MICROSERVICES-FRAMEWORK-MULTIBRAN...	9.12.2	2022-12-07 14:...	504f21b67f1...	2351
calypso-id-api	CALYPSO-ID-API-MULTIBRANCH/master	2.1.0-17.0.0.0	2022-10-12 23:...	bc93153584...	44
calypso-jboss-login-module	CALYPSO-EXTENSION-JBOSS-MULTIBRANC...	10.0.2	2021-12-23 03:...	894127c3d4...	8
calypso-swingx	CALYPSO-SWINGX-MULTIBRANCH/master	3.1.0	2022-11-18 02:...	63a4c14b7f2...	36
calypso-calibintegration	CALIB-MULTIBRANCH/CALIB_401-5_PATCHES	401.5.5-17.0.0.0	2022-11-15 05:...	884dee7946...	24
calypso-calib	CALIB-MULTIBRANCH/CALIB_401-5_PATCHES	401.5.5-17.0.0.0	2022-11-15 05:...	884dee7946...	24
calypso-lowlatencymessa...	CALYPSO-LOWLATENCYMESSAGING-MULTI...	10.6.0	2022-11-14 01:...	7ca79e8f942...	99
calypso-pricingscript-par...	CALIB-MULTIBRANCH/CALIB_401-5_PATCHES	401.5.5-17.0.0.0	2022-11-15 05:...	884dee7946...	24
calypso-autodiff	CALIB-MULTIBRANCH/CALIB_401-5_PATCHES	401.5.5-17.0.0.0	2022-11-15 05:...	884dee7946...	24
calypso-scheduling-engin...	SCHEDULING-ENGINE-MULTIBRANCH/SCHE...	8.1.1-17.0.0.0	2022-11-16 05:...	7f4b4795afb...	3
calypso-scheduling-engin...	SCHEDULING-ENGINE-MULTIBRANCH/SCHE...	8.1.1-17.0.0.0	2022-11-16 05:...	7f4b4795afb...	3
calypso-scheduling-engin...	SCHEDULING-ENGINE-MULTIBRANCH/SCHE...	8.1.1-17.0.0.0	2022-11-16 05:...	7f4b4795afb...	3
calypso-scheduling-engin...	SCHEDULING-ENGINE-MULTIBRANCH/SCHE...	8.1.1-17.0.0.0	2022-11-16 05:...	7f4b4795afb...	3
calypso-scheduling-engin...	SCHEDULING-ENGINE-MULTIBRANCH/SCHE...	8.1.1-17.0.0.0	2022-11-16 05:...	7f4b4795afb...	3
calypso-hdtools	CALYPSO-HDTOOLS-MULTIBRANCH/HDTOO...	2.4.1	2022-11-18 01:...	9d5d7dec54f...	3
calypso-launcher	CALYPSO-HDTOOLS-MULTIBRANCH/HDTOO...	2.4.1	2022-11-18 01:...	9d5d7dec54f...	3
calypso-graphics	CALYPSO-GRAPHICS-MULTIBRANCH/CALYP...	3.0.1	2022-01-06 02:...	9a55d8051e...	5
calypso-navigator		17.22.12.5-FRONTOFFICE_17-SNAPSHOT			