

FINCAD makes pricing derivatives and fixed

income products easier than ever.

# Price Derivative and Fixed Income Instruments in Microsoft Excel

Based on 30 years of experience, FINCAD's analytics for Microsoft Excel are the world's first standard library of predefined calculators and workbooks that simplify valuation and risk analytics for derivatives and fixed income products.

With over 2,000 pre-configured functions and over 200 workbooks at your fingertips, FINCAD's functional analytics library empowers you to calculate pricing, risk, and cash flows within minutes.

### GET STARTED RIGHT AWAY, VALUING YOUR PORTFOLIO WITH CONFIDENCE.

irowse for: All •			
lecently Used	Interest Rate Curves	One Factor Hull-White Model	ZaaCalbrateCaplets_HW
workes	Model Calibration	Two Factor Hull-White Model	LaaCalbrateCapiets2_HW
se - Curves, Calibration & Utilities	Value At Risk	Black-Karasinski Model	Calbrate RCap_HW
erest Rate	Ubity Functions	Heston Model	LeaCalbrateRCap2_HW
ed Income, MBS & Inflation		LV Model	ZaaCalbrateSwaption_HW
str		SABR Model	ZaaCalbrateSwaption_HW2
omnodity		LMM Model	aaCalbrate Swaptions_HW
uty			LasCalbrateSwaptions2_HW
reign Exchange			Calibration - Auto (BK & HW - using Swaptions)
			RCalibration - Auto (BK & HW - using Swaptions) (BLP(R))
			Calibration (BK & HW - using Caplets & Swaptions)
			Calibration (BK & HW - using Capieta)
	Rate Models		
Calibration of Interest Overview The pricing of a financial derivative r he SABR model. The models depend	elies on a model that describes the underlying proc I on one or more parameters that need to be detern	nined by matching the model predictions to available market	White model, Black-Karasinski model, the LIBOR Market Model, and data. This is the process of calibration.
he SABR model. The models depend A calibrated model is therefore a mo close as possible) the prices of calibr	elles on a model that describes the underlying proc on one or more parameters that need to be detern del whose parameters have values that are consist ation instruments observed in the market. For exan	nined by matching the model predictions to available market ent with market observations. Calibration involves finding va	White model, Black-Karasinski model, the LIBOR Market Model, and data. This is the process of calibration. Jules of the parameters such that the model is able to reproduce (as trace voldtilles and correlations) are round by calibrating the model

## FINCAD offers an unmatched user experience.

Find models, workbook solutions and documentation quickly with an Analytics Finder. Review and understand function inputs with a Function Wizard, and get help with error debugging. Easy-to-use Excel tools enable calculation and array management.

### The widest range of instrument capabilities in the market

#### Get out-of-the-box coverage

for vanilla, structured and exotic instruments across all major asset classes using industry standard models, supported by comprehensive curve-building and model calibration. Calculate risk and implied equivalent metrics. Use building blocks to configure customized trade types and analysis workflows.

		TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Select Bucket		Overnight Deposits	FRAs	Overnight Futures	Overnight Swaps	Overnight FRNs	Fixed Rate Bonds	Overnight Caps/Floors	Overnight Swaptions	Net Exposur
TRUE	parallel shift - deposit rates	-11.86	-18.97	-58.82	250.59	16.51	26.17	-0.38	199.14	402.39
TRUE	parallel shift - futures rates	-3.57	211.01	326.46	-229.19	-101.40	342.03	-9.96	-2,670.04	-2,134.65
TRUE	parallel shift - swap rates	0.00	-8.47	-0.83	-835.85	4.77	-375.30	4.13	0.00	-1,211.54
TRUE	AllPts	-11.86	-18.97	-58.82	250.59	16.51	26.17	-0.38	199.14	402.39
TRUE	11-01-2020	-11.86	-11.81	-19.33	250.59	16.51	25.29	2.65	61.24	313.30
TRUE	12-01-2020	0.00	-15.63	-40.31	252.25	4.77	24.86	1.34	125.45	352.73
TRUE	01-01-2021	0.00	-8.47	-0.83	252.25	4.77	24.94	3.89	30.20	306.75
TRUE	AllPts futures	-3.57	211.01	326.46	-229.19	-101.40	342.03	-9.96	-2,670.04	-2,134.6
TRUE	V20 futures	-3.57	2.56	54.29	101.47	-24.57	61.88	-4.32	-164.52	23.22
TRUE	F21 futures	0.00	17.91	138.98	100.25	-26.80	62.36	1.82	-292.12	2.40
TRUE	J21 futures	0.00	20.09	27.29	92.49	-26.80	62.30	11.96	-315.59	-128.25
TRUE	N21 futures	0.00	269.57	27.51	234.14	-28.25	62.00	2.23	-304.28	262.92
TRUE	V21 futures	0.00	269.57	27.51	234.14	-28.25	62.00	2.23	-304.28	262.92
TRUE	F22 futures	0.00	-10.68	0.26	252.00	-1.43	62.27	3.09	-297.07	8.44
TRUE	J22 futures	0.00	-8.12	-1.03	251.96	7.26	61.64	5.53	-294.75	22.49
TRUE	N22 futures	0.00	-8.47	-0.83	252.42	18.89	61.38	5.09	-289.53	38.95
TRUE	V22 futures	0.00	-8.47	-0.83	251.84	17.33	45.10	-3.02	-287.84	14.11
TRUE	F23 futures	0.00	-8.47	-0.83	251.76	9.59	20.71	-1.01	-34.42	237.33
TRUE	J23 futures	0.00	-8.47	-0.83	251.69	3.81	23.97	-1.04	6.42	275.55
TRUE	N23 futures	0.00	-8.47	-0.83	252.20	4.77	24.46	10.07	3.86	286.06
TRUE	AllPts swap	0.00	-8.47	-0.83	-835.85	4.77	-375.30	4.13	0.00	-1,211.5
TRUE	3y swap	0.00	-8.47	-0.83	259.89	4.77	-293.73	4.13	0.00	-34.24
TRUE	4y swap	0.00	-8.47	-0.83	412.99	4.77	-109.53	4.13	0.00	303.07
TRUE	5 y swap	0.00	-8.47	-0.83	-593.58	4.77	19.49	4.13	0.00	-574.49
TRUE	7y swap	0.00	-8.47	-0.83	-233.63	4.77	97.69	4.13	0.00	-136.34
TRUE	10y swap	0.00	-8.47	-0.83	296.44	4.77	18.29	4.13	0.00	314.34
TRUE	12y swap	0.00	-8.47	-0.83	252.25	4.77	24.46	4.13	0.00	276.31
TRUE	15y swap	0.00	-8.47	-0.83	697.26	4.77	23.87	4.13	0.00	720.73
TRUE	20y swap	0.00	-8.47	-0.83	1,004.01	4.77	17.42	4.13	0.00	1,021.04
TRUE	25y swap	0.00	-8.47	-0.83	1,310.77	4.77	10.97	4.13	0.00	1,321.34
TRUE	30y swap	0.00	-8.47	-0.83	1,617.52	4.77	4.53	4.13	0.00	1,621.6
TRUE	40y swap	0.00	-8.47	-0.83	1,924.28	4.77	-1.92	4.13	0.00	1,921.9
TRUE	AllPts basis swap	0.00	-8.47	-0.83	2,231.03	4.77	-8.37	4.13	0.00	2,222.27

Introduction to FINCAD Analytics	Q »								
Installation									
Analytics Suite for Excel®									
Analytics Suite for Developers	Calibration of Interest Rate Models %								
References	Overview								
Math References									
Commodity Derivatives					t rate models include the Hull-White model, Black-Karasinski model, the LIBOR Market Model, an redictions to available market data. This is the process of calibration.				
Credit Derivatives	A calibrated model whose parameters have values that are consistent with market observations, Calibration involves finding values of the arrangeters used that the model is able to reproduce (as								
Equity Derivatives	A calibrated model is therefore a model whose parameters have values that are consistent with market observations. Calibration involves thrading values of the parameters such that the model is able to reproduce (as close as possible) the prices of calibration instruments observed in the market. For example, values of the LIBOR Market Model parameters (forward rate volatilities and correlations) are found by calibrating the mode to market-quoted prices or to implied volatilities of capites and European-style swaptions. FINCAD provides functions for the calibration of the following interest rate models:								
Fixed Income (Bonds & Curves)									
Fixed Income (Derivatives)									
Floating Rate Notes	One-Factor Short Rate Models: Hull-White, Ho-Lee, Black-Karasinski, Black-Derman-Toy (BDT, also: Lognormal Short Rate) <sup>1</sup> .								
Foreign Exchange Derivatives	Two-Factor Short Rate Models: Hull-White, Two-Additive-Factor Gaussian								
Inflation-Indexed Securities	LIBOR Market Model: standard log-normal, as well as enhanced LMM with Constant Elasticity of Variance (CEV) and Displaced Diffusion (DD) local volatility processes								
Interest Rate Curves	<ul> <li>SABR Mode</li> </ul>	el of Stochastic Volat	ility						
Interest Rate Derivatives	For all of these	interest rate models	the calibration instruments (the m	arket data) are interest rate caplets/floorlets an	d European-style swaptions.				
Swaps	For all of these interest rate models, the calibration instruments (the market data) are interest rate capites/floorlets and European-style swaptions.								
Floating Rate Notes and Floating Legs of Swaps	A rate cap can be specified as a series of capiets. For this reason have deprecated the rate cap calibration functions and recommend that users use the capiet calibration functions. The functional forms of the modeled processes and the parameters associated with each model are shown in subsectormulas. The Two-Factor Models, the LIBOR Market Model and the SABR model are described in								
Floating Rate Notes with Averaging (Municipal / Tax-Exempt market)	more detail in l	Multi-Factor Short Ri	ate Models, LIBOR Market Model a	nd Option Pricing with the SABR Model of Stoch	hastic Volatility respectively. For additional information on all interest rate models, see Reference				
Constant Maturity Derivatives	Table 1: Model	s that are supported	by FINCAD calibration functions						
LIBOR-in-Arrears Swaps	Nodel Process modelloj ENCAD calibration parameters Comments								
Interest Rate Caps and Floors (Average)	One- Factor Short Rate	Hull.White	$dr = [\theta(t) - ar]dt + \sigma dW$	Short rate mean reversion and volatility: e, e	#(t) is determined from the initial term structure.				
Interest Rate Caps and Floors		Ho-Lee	$dr = \theta(t)dt + \sigma dW$	Short rate volatility: #	Same as Hull-White with $g = 0$ .				
CMS Caplets and Floor lets		Block-Karasinski	$d(\ln r) = [\theta(t) - a \ln r]dt + \sigma dW$	Short rate mean reversion and volatility: $a, \sigma$	θ(t) is determined from the initial term structure.				
LIBOR Market Model	$d(lar) = \theta(t)dt + \sigma dW$ Short rate valuiting: $\sigma$ Same as Black-Straininki with $a = 0$ .								
Multi-Factor Short Rate Models		(lognormal)							
Volatility Bootstrapping	Two- Factor Short Rate	Hull-White	$dr = [\theta(t) + u - er]dt + \sigma_1 dW_1$ $du = -badt + \sigma_2 dW_2$	Reversions and volatilities: $a, b, \sigma_1, \sigma_2$ and correlation: $p$	w(t) is determined from the initial term structure.				
Calibration of Interest Rate			$dU = -00dt + \sigma_2 dw_2$ $dW_1 dW_2 = pdt$						
Models		Two-Additive-Fector	$r(t) = x(t) + y(t) + \varphi(t), r(0) = r_0$	Reversions and volatilities: $a, b, \sigma, \eta$ ; and correlation: $P$	Deterministic shift, $\varphi(l)$ is determined from the initial term structure.				
Accrual Interest Rate Swaps (Extend bie)		Geussian	$eq:started_st$						
		1	$dW_1 dW_2 = \rho dt$						

## Access comprehensive documentation

explaining what each instrument is, all the way down to the mathematical formulas used in each calculation. With FINCAD, you will have utmost confidence in the math and models underlying your valuation and risk.

Get the answers you need fast with FINCAD's analytics for Microsoft Excel.



Stay ahead of the curve. Schedule a conversation with a solutions specialist today.

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