

Handbook of Brilliant Option Pricer

BSM Model

PRICER (BSM MODEL)

INPUTS DELETE INPUT

Spot Price	223 €
Strike Price	250 €
Expiry Date	2019/10/24
Volatility	16%
Risk free rate	2%
Product	10
Call/Put	Put
European/American	European

OUTPUTS

Call price		Delta	-0.7000
Put price	28.605479439	Gamma	0.0098
		Vega	76.8151
		Theta	2.5577
		Rho	-181.4797

SELECT AN INPUT

SELECT AN INPUT

PRICE

DELETE RESULT

GENERATED INPUTS

Time to maturity	359 Days
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Step1: Press 'DELETE RESULT' and input the data, which are 'Spot Price', 'Strike Price', 'Expiry Date', 'Volatility', 'Risk-free Rate', 'Call/Put', 'European/American'.

Step 2: Press 'PRICE' and get the generated input 'Time to maturity' which computes days from today to expiry date.

Step 3: Then the pricer will compute the option price as well as the related Greek letters delta, gamma, vega, theta, rho, which reflect the change of option price when spot price changes, the change of delta when spot price changes, the change of option price when volatility changes, the change of option price when time to maturity changes, the change of option price when risk-free rate changes separately.

CRR Model

PRICER (CRR MODEL)

INPUTS DELETE INPUT

Spot Price	255 €
Strike Price	250 €
Expiry Date	2019/10/24
Volatility	16%
Risk free rate	2%
Number of Step	20
Call/Put	Call
European/American	European

OUTPUTS

Call	21.1413014
Put	
Delta	0.626545037

SELECT AN INPUT

SELECT AN INPUT

PRICE & Display Tree

DELETE RESULT

PRICE w/o TREE

GENERATED INPUTS

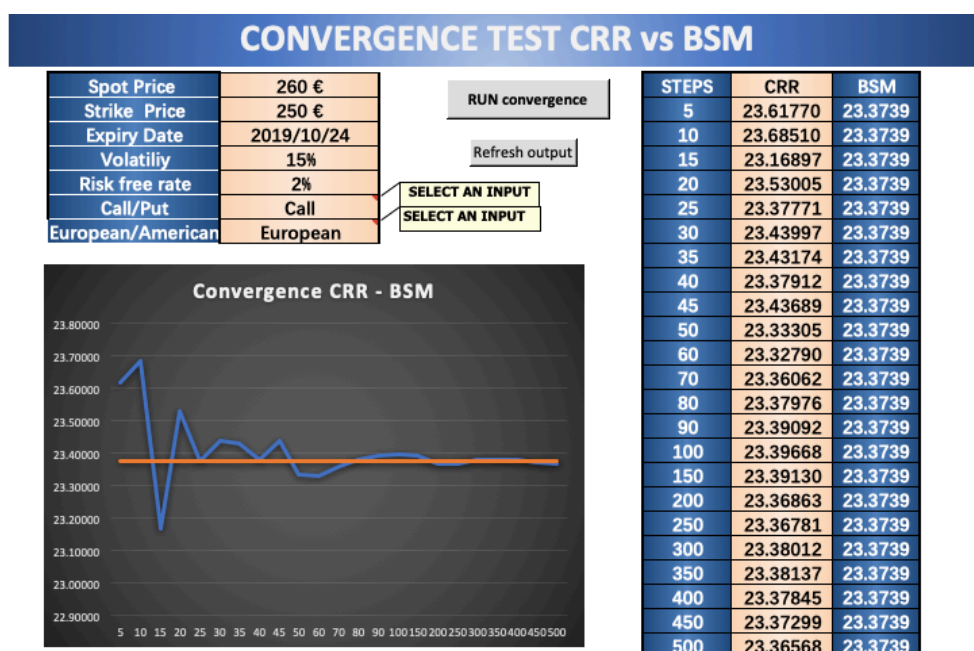
Upside	1.04
Downside	0.965475855
Risk Neutral Probability	0.504945444
Time to maturity	352 Days

Step 1: Press 'DELETE RESULT' and then input the model parameters, which has one more data 'Number of Step'.

Step 2: You can quickly get the price by pressing "PRICE w/o TREE" or pressing "PRICE & DISPLAY TREE" to have a look at the binomial tree. Generated inputs are extent of price changes when it goes up or down, probability distribution and time to maturity. And the risk-neutral probability is the probability that the price will go up in one period.

Step 3: When the screen shows "Done! Let's have a look at the TREE", you can look through the CRR tree in another work sheet.

Convergence



Step 1: Press "Refresh output" and then input the original data just like CRR model parameters.

Step 2: You can change every number in column "STEPS" and then press "RUN convergence" to have a look the convergence of targeted steps. As the above picture "Convergence CRR-BSM" stated, the results of CRR and BSM will become quite closer from 80 steps, namely, you can get a very precise price through CRR pricer with 80 steps.

There is a small problem that you cannot use convergence tool here to simulate American option since BSM pricer is not suitable here. For options written on a non-paying dividend stock it is never optimal to exercise an American option so its price is equal to European options price.