

Black-Scholes Options Worksheet

STOCK 50.00	VOL% 25.00%	DIV% 0.00%	CALL	
STRIKE 60.00	R.F.% 7.00%	DAYS# 180	PUT	
Delta (δ)	Gamma (γ)	Vega (v)	Theta (θ)	Rho (ρ)

This worksheet implements the widely used Black-Scholes European option valuation model to calculate the prices of a **CALL** and **PUT** European stock options.

Black-Scholes Options Menu Actions	
STOCK	Input the current market value of the underlying asset.
STRIKE	Input the strike price on the option.
DIV%	Input the current annualized dividend yield of the asset.
VOL%	Input the stock annualized volatility.
DAYS#	Input the number of days to expiration of the option.
R.F.%	Input the risk free rate that corresponds to the option lifetime.
CALL	Calculates the call option price.
PUT	Calculates the put option price.
Delta	Calculates the Greek 'Delta' for the CALL or PUT options values.
Gamma	Calculates the Greek 'Gamma' for the CALL or PUT options values.
Vega	Calculates the Greek 'Vega' for the CALL or PUT options values.
Theta	Calculates the Greek 'Theta' for the CALL or PUT options values.
Rho	Calculates the Greek 'Rho' for the CALL or PUT options values.

To perform the calculation, the values of “**STOCK**”, “**STRIKE**”, “**DIV%**”, “**VOL%**”, “**R.F.%**” and “**DAYS#**” must be entered typing the value and touching in the corresponding button. Then, touch the “**CALL**” or “**PUT**” to calculate the options values.

To calculate the “Greeks”, select the “Greek” you want and then press the “**CALL**” or “**PUT**” to calculate the value.

Example:

Consider the European call and put options on a stock that has a current spot price of \$50 and a volatility of 25%. The option has a strike price of \$60 and matures in 180 days. The risk-free interest rate is 7%. What are the values of the PUT and CALL options?, and the “Greeks” of it.

Solution:

Keystroke	Description
50 [STOCK]	Input the current market value of the underlying asset.
60 [STRIKE]	Input the strike price on the option.
25 [VOL%]	Input the stock annualized volatility.
0 [DIV%]	Input the current annualized dividend yield of the asset.
7 [R.F.%]	Input the risk free rate that corresponds to the option lifetime.
180 [DAYS]	Input the number of days to expiration of the option.
[CALL]	Calculates the call option price. Result = 1.05
[PUT]	Calculates the put option price. Result = 9.02
[Delta] [CALL] [Delta] [PUT]	Calculates the ‘Delta’ of the CALL option -> $\delta.call = 0.23$ Calculates the ‘Delta’ of the PUT option -> $\delta.put = -0.77$
[Gamma] [CALL] or [PUT]	Calculates the greek ‘Gamma’ -> $\gamma = 0.03$.
[Vega] [CALL] or [PUT]	Calculates the greek ‘Vega’ -> $v = 10.54$
[Theta] [CALL] [Theta] [PUT]	Calculates the ‘Theta’ of the CALL option -> $\theta.call = -3.39$ Calculates the ‘Theta’ of the PUT option -> $\theta.put = 0.67$
[Rho] [CALL] [Rho] [PUT]	Calculates the ‘Rho’ of the CALL option -> $\rho.call = 5.04$ Calculates the ‘Rho’ of the PUT option -> $\rho.put = -23.55$