

Draft Help Material for OPT_* Functions

OPT_BARRIER

Returns the pricing for a barrier option, calculated using the Black-Scholes option pricing model.

For relevant background information, visit the [Option \(finance\)](#) and [Black-Scholes model](#) Wikipedia pages.

Syntax

OPT_BARRIER(Spot; Volatility; Rate; Foreign Rate; Maturity; Strike; Lower Barrier; Upper Barrier; Rebate; Put or Call; In or Out; Barrier Monitoring; Greek)

Spot is the price / value of the underlying asset and should be greater than 0.0.

Volatility is the annual percentage volatility of the underlying asset expressed as a decimal (for example, enter 30% as 0.3). The value should be greater than 0.0.

Rate is the continuously compounded interest rate. This is a percentage expressed as a decimal (for example, enter 40% as 0.4).

Foreign Rate is the continuously compounded foreign interest rate. This is a percentage expressed as a decimal (for example, enter 50% as 0.5).

Maturity is the time to maturity of the option, in years, and should be non-negative.

Strike is the strike price of the option and should be non-negative.

Lower Barrier is the predetermined lower barrier price; set to zero for no lower barrier.

Upper Barrier is the predetermined upper barrier price; set to zero for no upper barrier.

Rebate is the amount of money to be paid at maturity if the barrier is hit.

Put or Call is a string that defines whether the option is a put ("p") or a call ("c").

In or Out is a string that defines whether the option is knock-in ("i") or knock-out ("o").

Barrier Monitoring is a string that defines whether the barrier is monitored continuously ("c") or only at the end / maturity ("e").

Greek (optional) is a string argument. If omitted or set to "value", "v", "price", or "p", then the function simply returns the option price. If another valid string is entered, the function returns price sensitivities (Greeks) to one of the input parameters. The valid options in this case are as follows.

- "delta" or "d".
- "gamma" or "g".
- "theta" or "t".
- "vega" or "e".
- "volga" or "o".
- "vanna" or "a".
- "rho" or "r".
- "rhof" or "f".

For more background information on this argument, visit the [Greeks \(finance\)](#) Wikipedia page.

Example

=OPT_BARRIER(30,0.2,0.06,0,1,40,25,0,0,"c","o","c") returns the value 0.4243.

=OPT_BARRIER(50,0.4,0.05,0,0.5,65,0,80,0,"p","o","c","e") returns the value 10.1585.

OPT_TOUCH

Returns the pricing of a touch / no-touch option, calculated using the Black-Scholes option pricing model.

For relevant background information, visit the [Options \(finance\)](#) and [Black-Scholes model](#) Wikipedia pages. Further information about touch / no-touch options may be found on many financial websites.

Syntax

OPT_TOUCH(Spot; Volatility; Rate; Foreign Rate; Maturity; Lower Barrier; Upper Barrier; Domestic or Foreign; In or Out; Barrier Monitoring; Greek)

Spot is the price / value of the underlying asset and should be greater than 0.0.

Volatility is the annual percentage volatility of the underlying asset expressed as a decimal (for example, enter 30% as 0.3). The value should be greater than 0.0.

Rate is the continuously compounded interest rate. This is a percentage expressed as a decimal (for example, enter 40% as 0.4).

Foreign Rate is the continuously compounded foreign interest rate. This is a percentage expressed as a decimal (for example, enter 50% as 0.5).

Maturity is the time to maturity of the option, in years, and should be non-negative.

Lower Barrier is the predetermined lower barrier price; set to zero for no lower barrier.

Upper Barrier is the predetermined upper barrier price; set to zero for no upper barrier.

Domestic or Foreign is a string that defines whether the option pays domestic ("d") or foreign ("f") currency.

In or Out is a string that defines whether the option is knock-in ("i") or knock-out ("o").

Barrier Monitoring is a string that defines whether the barrier is monitored continuously ("c") or only at the end / maturity ("e").

Greek (optional) is a string argument. If omitted or set to "value", "v", "price", or "p", then the function simply returns the option price. If another valid string is entered, the function returns price sensitivities (Greeks) to one of the input parameters. The valid options in this case are as follows.

- "delta" or "d".
- "gamma" or "g".
- "theta" or "t".
- "vega" or "e".
- "volga" or "o".
- "vanna" or "a".
- "rho" or "r".
- "rhof" or "f".

For more background information on this argument, visit the [Greeks \(finance\)](#) Wikipedia page.

Example

=OPT_TOUCH(50,0.25,0.05,0,1,0,55,"d","i","c") returns the value 0.6876.

=OPT_TOUCH(80,0.2,0.05,0,0.5,60,0,"f","o","c","r") returns the value 15.5516.

OPT_PROB_HIT

Returns the probability that an asset hits a predetermined barrier price, assuming that the stock price can be modeled as a process S that follows the stochastic differential equation, as follows.

$$\frac{dS}{S} = \mu dt + \text{vol } dW$$

μ is the asset's percentage drift, vol is the percentage volatility of the stock, and dW is a random sample drawn from a normal distribution with a zero mean. W is a Wiener process or Brownian motion.

For relevant background information, visit the [Options \(finance\)](#) and [Wiener process](#) Wikipedia pages.

Syntax

OPT_PROB_HIT(Spot; Volatility; Drift; Maturity; Lower Barrier; Upper Barrier)

Spot is the price / value of the underlying asset and should be greater than 0.0.

Volatility is the annual percentage volatility of the underlying asset expressed as a decimal (for example, enter 30% as 0.3). The value should be greater than 0.0.

Drift is the annual stock price percentage drift rate (μ in the above formula). The value is expressed as a decimal (for example, enter 15% as 0.15).

Maturity is the time to maturity of the option, in years, and should be non-negative.

Lower Barrier is the predetermined lower barrier price; set to zero for no lower barrier.

Upper Barrier is the predetermined upper barrier price; set to zero for no upper barrier.

Example

=OPT_PROB_HIT(30,0.2,0.3,1,0,40) returns the value 0.6119.

=OPT_PROB_HIT(70,0.3,0.1,0.5,60,0) returns the value 0.4239.

OPT_PROB_INMONEY

Returns the probability that an asset will end up between two barrier levels at maturity, assuming that the stock price can be modeled as a process S that follows the stochastic differential equation, as follows.

$$\frac{dS}{S} = \mu dt + \text{vol } dW$$

μ is the asset's percentage drift, vol is the percentage volatility of the stock, and dW is a random sample drawn from a normal distribution with a zero mean. W is a Wiener process or Brownian motion.

If the optional **Strike** and **Put or Call** arguments are included, then

- For a call option, the function returns the probability that the asset will end up between **Strike** and **Upper Barrier**.

- For a put option, the function returns the probability that the asset will end up between **Lower Barrier** and **Strike**.

The function ignores the possibility of knock-out before maturity.

For relevant background information, visit the [Options \(finance\)](#) and [Wiener process](#) Wikipedia pages.

Syntax

`OPT_PROB_INMONEY(Spot; Volatility; Drift; Maturity; Lower Barrier; Upper Barrier; Strike; Put or Call)`

Spot is the price / value of the underlying asset and should be greater than 0.0.

Volatility is the annual percentage volatility of the underlying asset expressed as a decimal (for example, enter 30% as 0.3). The value should be greater than 0.0.

Drift is the annual stock price percentage drift rate (μ in the above formula). The value is expressed as a decimal (for example, enter 15% as 0.15).

Maturity is the time to maturity of the option, in years, and should be non-negative.

Lower Barrier is the predetermined lower barrier price; set to zero for no lower barrier.

Upper Barrier is the predetermined upper barrier price; set to zero for no upper barrier.

Strike (optional) is the strike price of the option and should be non-negative. The default is -1.0 (to indicate that a value has not been set).

Put or Call (optional) is a string that defines whether the option is a put ("p") or a call ("c"). The default is "c".

Example

`=OPT_PROB_INMONEY(30,0.2,0.1,1,0,50)` returns the value 0.9844.

`=OPT_PROB_INMONEY(70,0.3,0.15,1,60,0,80,"p")` returns the value 0.3440.