

## Digital (binary) cash-or-nothing option pricing

created by Thijs van den Berg

$$C = Me^{(Y-r)T} N(d_2)$$

$$P = Me^{(Y-r)T} N(-d_2)$$

$$d_1 = \frac{\ln(S/K) + (Y + \frac{1}{2}\sigma^2)T}{\sigma\sqrt{T}}$$

$$d_2 = d_1 - \sigma\sqrt{T}$$

The cash-or-nothing digital option give a fixed payout of M when the underlying S ends up above (call) or below (put) the strike K.

### Symbol list:

C	Price of the digital cash-or-nothing call option
P	Price of the digital cash-or-nothing put option
M	Payout cash amount
S	Present value of the underlying asset
Y	Yield of the underlying asset. Y=r for stock, Y=0 for futures
$\sigma$	Volatility of the underlying asset
r	Continuous compounded interest rate
T	Time till expiration
K	Strike (exercise) price
$N()$	Cumulative normal distribution
$\ln()$	Natural logarithm (base e)