

## Double Binary (digital) cash-or-nothing option

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$$\begin{aligned} \text{UpUp} &= \begin{cases} M & \text{if } S_1 \geq K_1, S_2 \geq K_2 \\ 0 & \text{otherwise} \end{cases} \\ \text{UpDown} &= \begin{cases} M & \text{if } S_1 \geq K_1, S_2 \leq K_2 \\ 0 & \text{otherwise} \end{cases} \\ \text{DownUp} &= \begin{cases} M & \text{if } S_1 \leq K_1, S_2 \geq K_2 \\ 0 & \text{otherwise} \end{cases} \\ \text{DownDown} &= \begin{cases} M & \text{if } S_1 \leq K_1, S_2 \leq K_2 \\ 0 & \text{otherwise} \end{cases} \end{aligned}$$

The double binary cash-or-nothing option has a fixed cash payout (M) that depends on whether the underlying assets (S1,S2) end above or below the strikes (K1,K2) at the expiration date.

There are four types of double binary cash options.

### Symbol list:

UpUp	Value of the double binary cash-or-nothing up-up option
UpDown	Value of the double binary cash-or-nothing up-down option
DownUp	Value of the double binary cash-or-nothing down-up option
DownDown	Value of the double binary cash-or-nothing down-down option
$S_1$	Value of the first asset at expiration
$S_2$	Value of the second asset at expiration
$K_1$	Strike of the first asset
$K_2$	Strike of the second asset
M	Cash payout at expiration