

bshw1d

1 Description

The Black-Scholes Hull-White model concerns with cases where the interest rate r is assumed to be stochastic. The dynamics under the risk neutral measure of the share price S is governed by the stochastic differential equation system

$$\begin{aligned}\frac{dS_t}{S_t} &= (r_t - \eta)dt + \sigma dZ_t, \\ dr_t &= \kappa_r(\theta_r(t) - r_t)dt + \sigma_r dW_t^1,\end{aligned}$$

with initial data $S_0 > 0$, $V_0 > 0$ and $r_0 > 0$, where Z , W^1 are suitable and possibly correlated Brownian motions. r_t is a generalized Ornstein Uhlenbeck (hereafter OU) process: here θ_r is not constant but it is a deterministic function which is completely determined by the market values of the zero-coupon bonds

2 Code Implementation