cf_cir1d_zcbond

Output parameters:

- Price

The stochastic differential equation representing the the short rate is given by

$$dr_t = k(\theta - r_t)dt + \sigma \sqrt{r_t}dW(t)$$

The price of the zero-coupon bond is given by

$$P(t,T) = A(t,T)e^{-B(t,T)\,r(t)}.$$

where

$$h = \sqrt{k^2 + 2\sigma^2}$$

$$A(t,T) = \left(\frac{2he^{(k+h)(T-t)/2}}{2h + (k+h)(e^{h(T-t)} - 1)}\right)^{\frac{2k\theta}{\sigma^2}}$$

and

$$B(t,T) = \frac{2(e^{h(T-t)} - 1)}{2h + (k+h)(e^{h(T-t)} - 1)}$$

References