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ap_fixedasian_milevskyposner

Output parameters:

- Price
- Delta

Description: Fixed Asian options are priced with Milevsky-Posner method that uses the reciprocal gamma density fitting the first two moments of the arithmetic average.[\[1\]](#)

/*Scaling of the parameters*/

/* Computation of the first two moments */

/* Fit the parameters a,b of of reciprocal gamma */

/*Integrate, using the Laguerre quadrature, the payoff function of Put op-

tion */

/* Put Price */

Taking the Put price formula from [\[1\]](#).

/* Call Price from Parity*/

Simple calculus give the call-put parity relationship

$$C_{T,t}(K) = P_{T,t}(K) - K * \exp(-r * (T - t)) + S(t) * \exp(-r * (T - t)) * (\exp(-(r - \text{divid}) * (T - t)) - 1) * \frac{1}{(T-t)*(r-\text{divid})}$$

/*Delta for Put option*/

Here we derive the delta using the numerical integration

/*Delta for call option*/

We use again the call-put parity relation

$$\Delta_C = \Delta_P + \exp(-r * (T - t)) * (\exp(-(r - \text{divid}) * (T - t)) - 1) * \frac{1}{(T - t) * (r - \text{divid})}$$

/*Price*/
/*Delta */

References

- [1] M.A.MILEVSKY S.E.POSNER. Asian options,the sum of lognormals and the reciprocal gamma distribution. *J.Of Financial and Quantitative Analysis*, 3:409–422, September 1998. [1](#)