Stochastic methods for finance, Report 3

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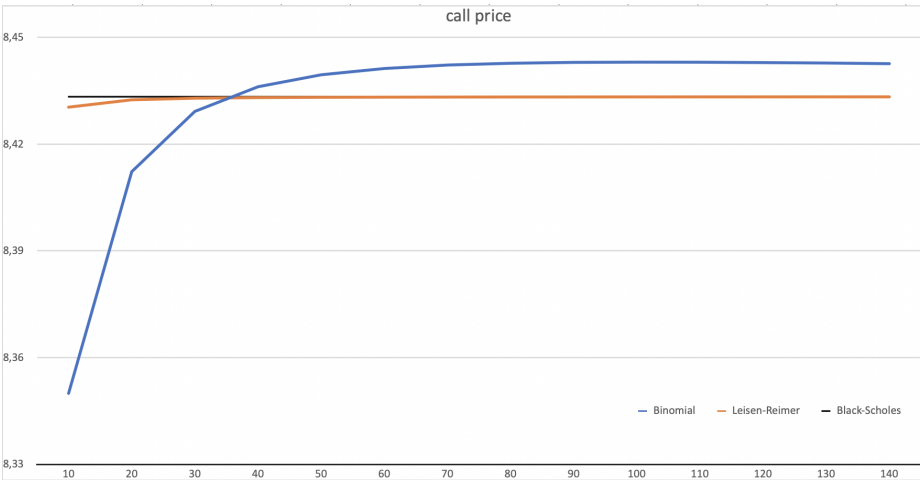
1 Report Description

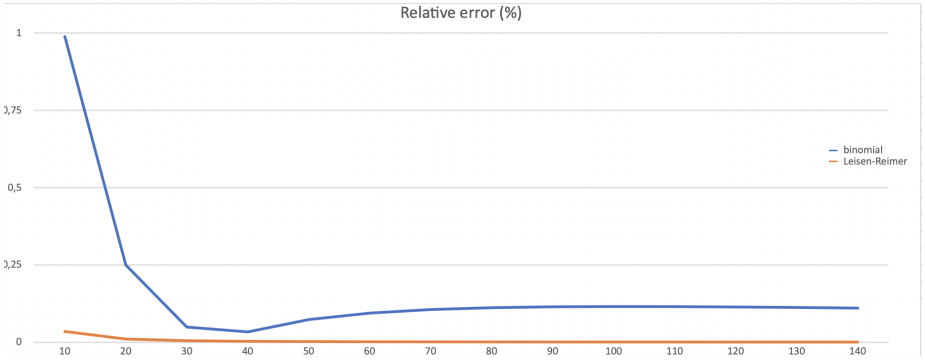
In this exercise we had to analyze the behaviour of the binomial and the Leisen-Reimer models with respect to the Black-Scholes model, pricing an European call option with spot price S = 100, volatility sigma = 20 %, risk free interest rates r = 1%, maturity T = 1 year and strike price K = 100. We had to compute the price in N nodes between 0 and T, varying from 10 to 140.

I calculated these prices implementing the relative functions with VBA language in excel.

In order to analyze the convergence of these models I calculated the relative error with respect to the option price calculated with the Black Scholes formula.

Here are the results presented in two plots, respectively showing the call price and the relative error relative to Black-Scholes.




Relative error (%)
1
0,75
0,5
0,25
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
binomial
Leisen-Reimer