Module 3 Assignment

April 2017

This is a Computational Finance task on the use of the Monte Carlo scheme to price Asian options.

Task

Use the expected value of the discounted payoff under the risk-neutral density Q

Q Σ —∫ T r dz Σ

V (S, t) = E

e

t

z

Pa¢off (ST )

for the appropriate form of payoff, to consider:

1. Arithmetic Sampling - fixed and floating strike

2. Geometric Sampling - fixed and floating strike

In both cases use the Euler-Maruyama scheme for simulating the underlying stock price using the following set of data

Today‘s stock price SO = fiOO

Strike E = fiOO

Time to expiry (f — t) = fi year

volatility o = XO%

constant risk-free interest rate r = 5%

This is an open ended exercise and marking will be based on initiative shown and willingness to experiment, but your completed assignment should centre on a short report (and computer code separately) to include:

* Outline of the numerical procedure used
* Results - appropriate tables, comparisons and error graphs (e.g. changing number of simulations).
* Any interesting observations and problems encountered.
* Conclusion and references