

Chapter 4

Conclusions and future research

This thesis surveys the pricing methods and the parameters of option contracts of American put option in preceding literatures. We have compared 14 existing American put option-pricing techniques based on speed and accuracy, such as RMSE and RAE, under different option conditions, the moneyness of options and option maturity. These conditions have significant influence on pricing methods.

The main results are that

1. The binomial Black and Scholes with Richardson extrapolation of Broadie and Detemple (1996) (BBSR) and the extrapolated Flexible Binomial Model of Tian (1999) (EFB) methods are both efficient improvements over the binomial method.
2. The numerical analysis methods, except for accelerated binomial method of Breen (1991) (ABT), will be more accurate when the time steps being larger.
3. The Least-Squares Simulation method of Longstaff and Schwartz (2001) (LSM) is not an effective method for pricing American put options.
4. With RMSE about 1%, the analytic approximations are faster than the numerical analysis methods.
5. The error grows with the moneyness, being much bigger for out-of-money options, for the numerical analysis methods, except for ABT method.
6. When pricing long maturity options, the accuracy of numerical analysis methods, except for ABT method, is more accurate than pricing short maturity options.

The further research of this thesis in the future is to evaluate the other American put option pricing methods. The reason is that there exists a great deal of methods for pricing American put option in related literatures. A summary of the advantages and disadvantages of these methods and finding that when and how these methods can be used well are necessary.