Valuation of Asian Option and Comparison with Vanilla Option in China Market

Chunyang Cao [1,¶], Lei Wang[2,¶] and Shiyi Zhang [3,¶]
[1]School of Science, City University of Hong Kong, Hong Kong, Guangdong, China;
[2]School of Business, University of Hertfordshire, Hatfield, Hertfordshire, AL10 9AB, UK;
[3]School of Management and Economics, Beijing Institute of Technology, Beijing, China.
[¶]These authors contribute equally.

Abstract:
Asian options are one of the most actively traded exotic options in the financial derivatives market today. Many investors will choose Asian options rather than Vanilla options. We select some data in China market and build a model to find the differences between Asian options and Vanilla options, and how these differences lead to the success of Asian options. We apply the stock price of the Shanghai Composite Index from 2015~2020 and Bank of China's current interest rate to determine volatility and risk-free rate of China. Then we predict future 21 trading days' stock prices respectively using two for loops: The inside one executes a recursive calculation using Black-Scholes Option Pricing Model for 21 times to simulate each day's price, the outside one represents times of simulation which is set as 10000. After this, using average stock price of the period, we valuate the value of Asian options and Vanilla options under the same situation, make comparison between the two and analyze their difference in risk and investor preference. We obtain possible value of the two financial derivatives in China market. By observing them, for Asian options, their prices are lower and abnormal great fluctuation in stock price in a single day have weaker influence on the final value. The result shows Asian options have a bright future in China market: spot companies which want to save cost in hedging and investors who want to avoid risk of fluctuation of the stock price near the expiry day are likely to buy them. Also, Asian Options are close to the cash flow in the production process or trade process of a company, some enterprises which need to hedge their average cash flow over a period of time such as agricultural products processing company tend to consume them.

Keywords: Asian options, Vanilla Option, Investment strategy, Chinese market, Risk, Investor preferences