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Master Thesis Defense

Entitled

VALUATION OF ASIAN OPTIONS IN A HIGH VOLATILITY MARKET WITH JUMPS

by

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Abstract

The evaluation of financial derivatives represents a central part of financial risk management. There are many types of derivatives among others path-dependent options. In this study, we aim at valuing Asian options. They are path dependent and have several advantages. For instance, their values are habitually lower than European options. Also, an Asian option on a commodity drops the risk value close to maturity. Though, the disadvantage is that they are in general difficult to value since the distribution of the payoff is usually unknown. On the other hand, It is agreed in the literature that a stochastic process with a jump for the underlying asset provides a more precise value for the option price. Moreover, the volatility is not constant, and it increases during a crisis. This work investigates the pricing of Asian options under a modified version of the pioneer Black Scholes model. It aims at suggesting an alternate model that comprises jumps and increased volatility. The study will propose to model the underlying asset with a new "hybrid" stochastic differential equation with jumps and high volatility. Then, under these settings, the valuation of Asian options will be investigated. Numerical techniques for finance will be used in this thesis to get a solution to the pricing problem. Several illustrations of the solution will be offered to demonstrate the efficiency of the used methods.

Keywords: Asian options, Stochastic Differential Equation, Brownian motion, Black Scholes model, finance.