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ANALYTICAL SOLUTIONS FOR THE ARITHMETIC ASIAN OPTION PDEs VIA TRANSFORMATION METHODS

Abstract:

Asian option is a path-dependent option where the payoff function depends on the historical average of the underlying asset. Asian options are very useful in the financial industry which can be used to hedge a thinly traded asset over a certain period of time. However, the pricing of Asian option remains a challenge. The closed-form analytical solution of the arithmetic Asian options PDE is not known. This is due to the fact that, the arithmetic average of a set of lognormal random variables is not lognormally distributed. This difficulty, moreover, has led to the development of various methods and models used to price these instruments. In this work we apply the change of variables to transform the arithmetic Asian option to the Black-Scholes equation and utilised some transformation methods to obtain the final solution to the arithmetic Asian option.