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A computational approach to Option pricing models.

Suppose in 3 months' time, someone has the option to purchase Microsoft shares from a broker for 50 dollars per share. Three months from now, he/she will check their market price and decide whether to exercise that option. This deal has no downside - three months from now you either make a profit or walk away unscathed, On the other hand, the seller have no potential gain and an unlimited potential loss. To compensate, there will be a cost to enter into the option contract. You must pay him some money up front. The option valuation problem is thus to compute a fair value for the option. The Black Scholes model is obtained as a solution to a parabolic PDE (called the Black Scholes PDE) for pricing an option for an underlying asset. If the asset is volatile then pricing the option through a model is particularly helpful to determine the Payoff function. Crank Nicholson implicit scheme is more realistic among the finite difference methods in the sense that it is stable regardless of the parameters. Although it is more complicated to implement Crank Nicholson scheme unconditional stability is too good an issue to compromise and hence used as the numerical technique to solve the PDE in this work. (Received February 18, 2010)