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## VALUING BARRIER OPTIONS USING PDE'S AND THE METHOD OF IMAGES

In this paper we show how to value barrier options using a Partial Differential Equations (PDE) approach.

Barrier Options are a class of options. Almost every European style option has a barrier option version. A barrier option has the same payoff as a standard option provided that a particular barrier is or is not crossed by the stock price process before the maturity date. There are 4 basic types of barrier option: the down and out, the down and in, the up and out and the up and in.

Using a method called the “method of images” we show how the valuation formulae for the down and out barrier option can be obtained in terms of the valuation formula for the standard option. We also show how the valuation formulae for the other 3 types of barrier option can be obtained from the valuation formula for the standard option and that for the down and out option.

Various examples of the method will be covered.