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The British Put Option

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Abstract

We present a new put option where the holder enjoys the early exercise feature of American options whereupon his payoff (deliverable immediately) is the 'best prediction' of the European payoff under the hypothesis that the true drift of the stock price equals a contract drift. Inherent in this is a protection feature which is key to the British put option. Should the option holder believe the true drift of the stock price to be unfavourable (based upon the observed price movements) he can substitute the true drift with the contract drift and minimize his losses. The practical implications of this protection feature are most remarkable as not only can the option holder exercise at or above the strike price to a substantial reimbursement of the original option price (covering the ability to sell in a liquid option market completely endogenously) but also when the stock price movements are favourable he will generally receive higher returns at a lesser price. We derive a closed form expression for the arbitrage-free price in terms of the rational exercise boundary and show that the rational exercise boundary itself can be characterized as the unique solution to a nonlinear integral equation.

Using these results we perform a financial analysis of the British put option that leads to the conclusions above and shows that with the contract drift properly selected the British put option becomes a very attractive alternative to the classic American put.

Key Words:

British put option | American put option | European put option | arbitrage-free price | rational exercise boundary | liquid/illiquid market | geometric Brownian motion | optimal stopping | parabolic free-boundary problem | nonlinear integral equation | local time–space calculus | non-monotone free boundary

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