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基于不确定波动率的非套利流动模型数值解法

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Numerical solution of a non-arbitrage liquidity model based on uncertain volatility

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- 摘要
- 参考文献
- 相关文章

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摘要 通过引入两种不确定波动率, 将已有非流动市场下的期权定价模型推广到更一般的情形. 由于模型比较复杂, 难以求得解析解, 通过构建相应的差分方程, 讨论了模型的数值解法, 并对算法的稳定性、相容性给予了证明. 最后, 数值实例比较分析了各个变量对期权价格的影响, 结果表明, 文算法放宽了对步长的要求, 在较少的运算量下可以得到较满意的数值结果.

关键词: 非流动市场 不确定波动率 数值解 期权 差分格式

Abstract: The option pricing model in illiquidity markets was expanded to general situations by introducing two kinds of uncertain volatility models. As it is difficulty to get analytical solutions for the model in complicated cases, a numerical solution was discussed by establishing corresponding differential equations; and the stability and consistency of the sdution were proved. Finally, the influence of some parameters to the solution was provided in numerical examples. The results show that the algorithm reduced the restriction on step-length requirements, and satisfactory approximation can be found with less computation.

Key words: illiquid markets uncertain volatility numerical solution option difference scheme

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