

Option Price When the Stock is a Semimartingale

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Abstract

The purpose of this note is to give a PDE satisfied by a call option when the price process is a semimartingale. The main result generalizes the PDE in the case when the stock price is a diffusion. Its proof uses Meyer-Tanaka and occupation density formulae. Presented approach also gives a new insight into the classical Black-Scholes formula. Rigorous proofs of some known results are also given.

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Bibliography

1. Bartels, H-J. (2000), *On martingale diffusions describing the 'smile-effect' from implied volatilities*. Appl. Stochastic models Bus. Ind. 16, 1-9. [Math. Review 2001d:91089](#)
2. Breeden, D. and Litzenberger, R. (1978), *Prices of contingent claims implied in option prices*. Journal of Business, 51, 621-651. Math. Review number not available.
3. Dupire, B. (1994), *Pricing with a smile*. Risk 7, 18-20. Math. Review number not available.
4. Dupire, B. (1997) *Pricing and hedging with smiles*. in Mathematics of derivative securities. Dempster and Pliska eds., Cambridge Uni. Press, 103-112. [Math. Review 98k:90014](#)
5. Klebaner, F.C. (1998), *Introduction to Stochastic Calculus with Applications*, Imperial College Press, London. [Math. Review 1832481](#)
6. Protter, P. (1992), *Stochastic Integration and Differential Equations*, Springer-Verlag, Berlin. [Math. Review 91i:60148](#)
7. Shiryaev, A.N. (1999), *Essentials of Stochastic Finance* World Scientific, Singapore. [Math. Review 2000e:91085](#)

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