

Soner, H. Mete; Touzi, Nizar

Superreplication under gamma constraints. (English) Zbl 0960.91036
SIAM J. Control Optimization 39, No. 1, 73-96 (2000).

In a financial market with the underlying price process given by a Markovian Itô diffusion, this paper studies the problem of superreplicating a given payoff under a gamma constraint on the hedging strategy. This constraint imposes a boundedness condition on the space derivative of the hedging strategy or on the second space derivative of the pricing function. For the general case, the authors prove a verification theorem characterizing the superreplication cost as the solution of a quasi-variational inequality; this is then solved explicitly in the Black-Scholes model with constant coefficients. The main tools are a new dynamic programming principle and viscosity solution techniques.

Reviewer: [Martin Schweizer \(Berlin\)](#)

MSC:

- [91G10](#) Portfolio theory
- [60H30](#) Applications of stochastic analysis (to PDEs, etc.)
- [35K55](#) Nonlinear parabolic equations
- [49J20](#) Existence theories for optimal control problems involving partial differential equations

Cited in **2** Reviews
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Keywords:

[superreplication](#); [gamma constraint](#); [stochastic control](#); [viscosity solution](#); [stochastic analysis](#)

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