Perfect option hedging for a large trader

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Abstract.

Standard derivative pricing theory is based on the assumption of agents acting as price takers on the market for the underlying asset. We relax this hypothesis and study if and how a large agent whose trades move prices can replicate the payoff of a derivative security. Our analysis extends prior work of Jarrow to economies with continuous security trading. We characterize the solution to the hedge problem in terms of a nonlinear partial differential equation and provide results on existence and uniqueness of this equation. Simulations are used to compare the hedging strategies in our model to standard Black-Scholes strategies.

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