

عنوان مقاله:

Portfolio with stochastic arbitrage return and its effect on option pricing

محل انتشار:

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نویسندگان:

Delavar Khalafi

M Karbaschi

M Mazidi

خلاصه مقاله:

The purpose of this paper is to explore the role that random arbitrage opportunities play in pricing financial derivatives. We use a non-equilibrium model to set up a stochastic portfolio and for the random arbitrage return, we choose a stationary ergodic random process rapidly varying in time. We exploit the fact that option price and random arbitrage returns change on different time scales which allows us to develop an asymptotic pricing theory involving the central limit theorem for random processes. We restrict ourselves to finding pricing bands for options rather than exact prices. The resulting pricing bands are shown to be independent of the detailed statistical characteristics of the arbitrage return. It is well-known that the classical Black-Scholes formula is consistent with quoted options prices if different volatilities are used for different option strikes and maturities. It is well-known that arbitrage opportunities always exist in the real world. Of course, arbitrageurs ensure that the prices of securities do not get out of line with their equilibrium values, and therefore virtual arbitrage is always short-lived. In this paper, we follow an approach where option pricing with stochastic volatility is considered. We exploit the fact that option price and random arbitrage return change on different time scales allowing us to develop an asymptotic pricing theory by using the central limit theorem for random processes. The approach yields pricing bands that are independent of the detailed statistical characteristics of the random arbitrage return.

کلمات کلیدی:

Black Scholes, Arbitrage, Portfolio, Option pricing, financial markets

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