

On pricing and hedging inverse BTC options*

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Abstract

The cryptocurrency market is growing and has attracted a plethora of investors making cryptocurrencies an almost inevitable asset class in today's financial markets. Deribit, the largest exchange for crypto options, offers European style cash-settle inverse options: the underlying asset is BTC, the strike is the value of a BTC denominated in USD, and the payoff is converted back to BTC. However, the studies on the derivatives market for cryptocurrency is still limited. Thus, we first explore unique features of inverse BTC options, based on data of the Blockchain-Research-Center.com. Second, we investigate if the practically useful stochastic volatility models with jumps are beneficial in pricing and hedging inverse BTC options. Due to the lack of closed-form pricing formulae of inverse BTC options under complex dynamics, we provide a feasible simulation scheme for model calibration and hedging. We find that stochastic volatility with correlated jumps out-perform the Black-Scholes model, Heston's stochastic volatility model, and Bates' stochastic volatility with jumps model in in-sample and out-of-sample pricing analysis, but they are indistinguishable in dynamic Delta hedge.

Keywords: cryptocurrency, crypto options, stochastic volatility models, correlated jumps, simulation, Delta hedge, CRIX, crypto index.

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