

# Implied Volatility of Leveraged ETF Options: Consistency and Scaling?

Tim Leung

*Columbia University*

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The growth of the exchange-traded fund (ETF) industry has given rise to the trading of options written on ETFs and their leveraged counterparts (LETFs). Motivated by a number of empirical market observations, we study the relationship between the ETF and LETF implied volatility surfaces under a general stochastic volatility framework. Analytic approximations for prices and implied volatilities are derived for LETF options, along with rigorous error bounds. In these price and IV expressions, we identify their non-trivial dependence on the leverage ratio. Moreover, we introduce a "moneyness-scaling" procedure for comparing implied volatilities across leverage ratios, and test it with empirical price data.