

Roger Lee: “Implied Volatility, Realized Volatility, and Mileage Options”

Abstract:

Given an option with initial implied volatility I , there exists a trading strategy, static in the option and dynamic in the underlying shares, which model-independently guarantees profit (loss) if realized volatility is greater than (less than) the implied volatility I . The dynamic share trading can be replaced by a static position in a perpetual "mileage option": a call or put with expiry at the random time when realized variance reaches an agreed level. In practice, however, mileage options often have expirations capped at a fixed time.

We develop stochastic time-change methods to derive model-free and model-dependent formulas for pricing capped-expiry mileage options.