Title: Discretisation-Invariant Swaps

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Abstract: Conventional variance swaps have only an approximate fair value formula, computed as the time integral of a stochastic variance, which also assumes a continuum of vanilla options strikes. Most other swaps that are based on realised price or return characteristics have similar limitations. The class of swaps introduced in this paper has an exact fair value which is independent of the frequency of monitoring the realised leg or assumptions on the underlying stochastic process as long as the market is free of arbitrage. Within these `time-discretisation invariant' swaps we introduce straddle and strangle swaps, whose fair values are derived solely from traded vanilla option prices. We conduct an empirical analysis of the returns on such contracts, which are unbiased estimators for their associated risk premiums, using 15 years of data on S&P futures and options. This demonstrates the diversity of the risk exposures attainable through trading discretisation-invariant swaps.