Timer-style options, Design, Pricing and Practice

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In this paper, we discuss a newly introduced exotic derivative called the “Timer Option”. Instead of being exercised at a fixed maturity date as a vanilla option, it has a random date of exercise linked to the realized variance of the underlying stock. Unlike common quadratic variation-based derivatives, the price of a timer option generally depends on the assumptions on the underlying variance process and its correlation with the stock (unless the risk-free rate is equal to zero). In a general stochastic volatility model, we first show how the pricing of a timer call option can be reduced to a one-dimensional problem. We then propose a fast and accurate almost-exact simulation technique coupled with a powerful (model-free) control variate. Examples are derived in the Hull and White and in the Heston stochastic volatility models. We will then present the timer-style options available in the marketplace, namely the capped timer option, the FX timer option, the time swap and the timer out-performance option and discuss their practical interests.