# Pattern Derivatives Extended

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**Abstract**

In this paper we extend the theory of pattern derivatives, generalizing results from a previous paper and providing examples of the usefulness of these derivatives in practical applications. In the simplest case a pattern derivative is a derivative where the payout is contingent on the occurrence (inclusive) or lack of occurrence (exclusive) of a given pattern in the time series describing the underlying asset. If we simplify the underlying movements using a binomial tree with $u$ and $d$ movements, then a pattern can be any sequence of $u$ and $d$ symbols which may appear during the life of the contract. In a previous paper we have proposed an efficient algorithm for pricing pattern derivatives, including the pricing of pattern derivatives involving more than one pattern. After reviewing these results and providing example applications, we show how ordinary derivatives can be reduced to pattern derivatives and generalize known pricing formula to handle more complex sets of patterns.