Lookback Option

A lookback option gives the holder the right but not the obligation to buy the underlying asset at the lowest price. The payoff of a lookback option is a single call-option-style based on the performance of the underlying asset's final price relative to its initial price, where both the initial and final prices are computed using a lookback formula.

There are several types of lookback options:

Lookback option on fixed strike

Lookback option on floating strike

Asian lookback option

Callable lookback note

Lookback options are designed to provide investors with the opportunity for an enhanced return while reducing the downside risks with partial protection that avoids any negative performance of the Reference Index over the term of the Notes. The look-back feature offers holders an optimal entry point for their investment.

The initial price is taken as the highest price observed over a set of Initial Lookback Dates. The final price is taken as the maximum of the running cumulative average, observed over a set of Payoff Observation Dates.

Lookback options provide a return that is determined by the optimal performance of a single asset or basket on a set schedule of lookback dates. The lookback options could have fixed and floating strikes.

1. Payoff

Call option for floating strike:

The payoff is $c_T = max(S_T - S_{0,T}^{min}, 0)$

where $S_{0,T}^{\min}$ ~ lowest price during the option's lifetime

Put option for floating strike:

The payoff is $p_T = max(S_{0,T}^{max} - S_T, 0)$
where $S_{0,T}^{\max}$ ~ highest price during the option's lifetime

Call option on fixed strike:

The payoff is payoff: $c_T = \max(S_{0,T}^{\max} - X;0)$
where X ~ strike

Put option on fixed strike:

The payoff is $c_T = \max(X - S_{0.T}^{\min};0)$
where X is the strike

Reference:

https://finpricing.com/lib/EqLookback.html