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## Chooser option, complex

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$$C = \max(C_{t_1}, P_{t_2})$$

$$C_{t_1} = \max(S_{t_1} - X_1, 0)$$

$$P_{t_2} = \max(X_2 - S_{t_2}, 0)$$

A complex chooser option gives the owner the choice as some fixed future date (before expiration) to get either a vanilla call or vanilla put option. The call and put option have different strikes and maturities.

The complex chooser option is a generalization to the simple chooser option which allows you to choose between a call and put with both the same strike and expiration date.

### Symbol list:

|           |   |
|-----------|---|
| $C_t$     | Value of the complex chooser option at the choice date t        |
| t         | Choice date   |
| $T_c$     | Expiration date of the call option                              |
| $T_p$     | Expiration date of the put option                               |
| $X_C$     | Strike (exercise) price of the call option                      |
| $X_P$     | Strike (exercise) price of the put option                       |
| $S_{T_c}$ | Price of the underlying asset at time of expiration of the call |
| $S_{T_p}$ | Price of the underlying asset at time of expiration of the call |
| $C_{T_c}$ | Price of the call option at its expiration                      |
| $P_{T_p}$ | Price of the call option at its expiration                      |