How Options Really Work

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1 Introduction

Recall that from the last article, we introduced a financial derivative called option, which contains the definition, terminology, and two main components that make up the price of an option.

In this article, we aim to discuss some option core concepts that are related to trading in the real world. We also cover the subtle, but vital details, which play important roles when people decide to trade options.

2 Option Styles

As we mentioned last time, in a very broad sense, options can be categorized into Calls and Puts, depends on whether they give the option buyer the right to buy or sell the underlying asset. However, this is not the only way, another way is based on their exercise style. They can basically be one of two styles: American style or European style, and these terms have nothing to do with anything geographical though.

- *European*: exercise only at expiry T.
- *American*: exercise anytime between 0 and expiry T.

The advantage of European style options is that they are cheaper, as the time value component is generally less due to option buyer only being able to exercise at the expiration date.

As a contrast, the advantage of American style options over European style options is the flexibility, which gives the option buyer higher chance to maximize return from trading. Meanwhile, the other advantage is related to dividends. Owning some certain stocks, stock holders will receive the a regular pay-out, typically quarterly, based on the company revenue and number of shares in hand. Sometimes the option buyer could exercise at dividend time so that they will be entitled to dividends, only if the expected dividends were higher than any time value, surely.

3 Moneyness

Briefly, the moneyness of an option defines the relationship between the strike price of that option and the current price of the underlying asset.

- *Out of the Money*: Options are in an out of the money state when the underlying asset is trading at a price that is less favorable for the holder.
  - *Calls*: Asset price is less than Strike price.
  - *Puts*: Asset price is greater than Strike price.
- *At the money*: Options where the strike price is equal to the price of the underlying asset are in an at the money state.
- *In the money*: Options are in an in the money state when the underlying asset is trading at a price that is favorable for the holder, that the option actually have intrinsic value.
  - *Calls*: Asset price is greater than Strike price.
  - *Puts*: Asset price is less than Strike price.

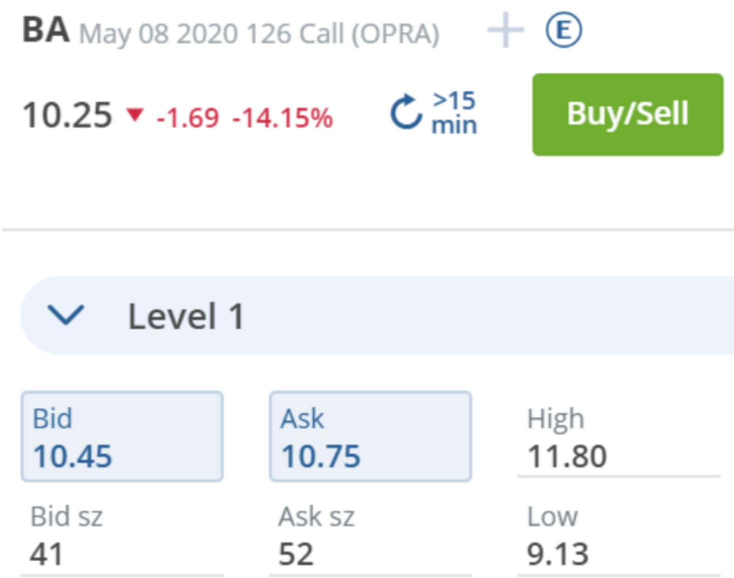
4 Contract Size

When trading options in US market, one contract contains 100 units of asset, which gives the holder a right to buy or sell 100 units of asset before the expiration. For example, if the price of an option is $2, to purchase one contract, option buyer should pay $200.

5 Bid and Ask price

The term *Bid* and *Ask* refers to a two-way price quotation that indicates the best potential price at which a security can be sold and bought at a given point in time. The bid price represents the highest price that a buyer is willing to pay for one share of option, while the ask price represents the lowest price that a seller is willing to sell for one share of option. Normally, the ask price should be higher than the bid price, and the transaction occurs whenever one of the two parties accepts a less preferable price.

A bid-ask spread is the amount by which the ask price exceeds the bid price for an option in the market. It is important to be aware of this, because of liquidity. Simply put, liquidity refers to how quickly traders can accomplish tradings. For example, intuitively, it is easy to buy or sell in a short time when the bid-ask spread is small.



`Example`:

The picture above is the quote details of the Call option for BA company, which expires in May/8/2020, with strike price is $126.

- The bid is $10.45, and the ask is $10.75.
- $10.25 on top is the price from the last transaction.
- High and Low refer to the highest price, and the lowest price of a day until now, respectively.

6 Exercising and Settlement

The basic premise of options are that they are financial derivatives that give the holder the right, to buy or sell an underlying asset at a fixed price. Should the option holder chooses to exercise the option, then simply there are two methods to settle.

- *Physical Settlement*: the most commonly used form of settlement, which requires the actual delivery of the underlying asset.
- *Cash Settlement*: a way that profit is paid to the option holder, on condition that there exist profit.

REMARK: Options traders tend to make their profits through buying, selling options rather than ever actually exercising them.

A common misconception among beginner options traders is that the unique way to make profit is to exercise the option. However, statistically speaking, buying or selling options have more earning potential.

Recall that Strike price (K), Expiration date (T), and we define two new terms, asset price at time t (S_t), buy-in Option price (P).

To simplify, suppose it is a call option, $0 < t < T$, and it is in the money state.

At this very moment, should option holder exercise the option:

$$Profit = (S_t - K) - P$$

Now let us compare selling the option. We know that two main components make up the price of an option, that are intrinsic value and time value.

Intrinsic value:

$$S_t - K$$

The current price of the call option is the sum of intrinsic value and time value:

$$(S_t - K) + TimeValue$$

Therefore, the profit from selling option is the difference between the current option price and previous option price:

$$Profit = (S_t - K) + TimeValue - P$$

Hence, we conclude that the lower bound of profit of an option (if it is in the money state) is by exercising it, as time value is greater or equal to 0.

NOTE: It will draw a same conclusion with Puts.

7 Summary

Upon completing the first two articles, the readers are expected to have a good understanding of the basic ideas of option trading and some vocabularies of modern finance market.

Although emphasis is not on mathematical rigor and completeness, a fair amount of mathematical knowledge is needed to understand the foundation.

Next topic, however, is mainly for practical applications purpose, including how options are priced, and Greek letters.