

## Banking and finance

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### **Part 3 : Second company**

The selected second company is Airbnb, and the company have exchange traded options.

#### **a) At-the-money (ATM) Call Option Payoff Graph for Airbnb, Inc.:**

An ATM call option is one where the strike price is equal to the current market price of the underlying asset. An ATM (At-The-Money) call option grants the holder the right, but not the obligation, to purchase the underlying asset at a predetermined price (the strike price) on or before the expiration date. In an ATM call option, the strike price closely aligns with the current market price of the underlying asset. This means that if exercised, the option allows buying the asset at a price very close to its current market value (Securities and Exchange Commission, 2024). ATM call options are utilized for strategies like speculating on future price movements, hedging against fluctuations, and earning income through option premiums.

The payoff for an ATM call option can be calculated as follows:

- **Stock Price:** This column represents different stock prices of Airbnb at expiration (ST). Each row corresponds to a different scenario where the stock price reaches a specific value.
- **Strike Price:** A strike price (K) of a call option is the marking sure the strike price. The strike price is the point at which the option owner can buy the asset underlying the option, once they exercise it (in this case, Airbnb stock).
- **Payoff:** This column illustrates the excess value of the call option in each scenario. The terminal or expiration price stands for profit/loss of the call option at any particular stock price.

Table

| Stock price | Strike price | Pay off |
|-------------|--------------|---------|
| 147         | 144          | 3       |
| 149         | 147          | 2       |
| 156.5       | 155          | 1.5     |
| 165         | 164          | 1       |
| 167         | 165          | 2       |

The revolutionary of the strike price is 144 and an ask-price of 147 the payoff of the call option is 3. This converts to the fact that at the expiration date if the stock price will be \$147, the holder of the call option can exercise the option to buy Airbnb stock at \$144 per share and at once sell it at the market rate of the stock \$147 per share making the profit of \$3 per share.

Similarly, for other scenarios:

- When the stock price is \$149 and the strike price is \$147, the payoff is \$2.
- When the stock price is \$156.5 and the strike price is \$155, the payoff is \$1.5.
- When the stock price is \$165 and the strike price is \$164, the payoff is \$1.
- When the stock price is \$167 and the strike price is \$165, the payoff is \$2.

These payoffs demonstrate the relationship between the stock price at expiration and the profitability of the call option. As the stock price increases above the strike price, the payoff of the call option also increases, reflecting the potential for higher profits if the option is exercised. Conversely, if the stock price is below the strike price, the payoff is zero, indicating that it would not be profitable to exercise the option in those scenarios.

Graph

#### **b) ATM Put Option Payoff for Airbnb, Inc.:**

An ATM (At-The-Money) put option is a financial contract giving the holder the right, but not the obligation, to sell the underlying asset at a predetermined price (the strike price) on or before the expiration date. In an ATM put option, the strike price closely matches the current market price of the underlying asset. This means that if exercised, the option allows selling the asset at a price very similar to its current market value., ATM put options are utilized for various purposes such as speculating on downward price movements, hedging against potential losses, and generating income through option premiums (U.S. Department of the Treasury, 2023).

Table

| Stock price | Strike price | Pay off |
|-------------|--------------|---------|
| 164         | 167          | 3       |
| 167         | 170          | 3       |
| 166.5       | 172.5        | 6       |
| 170.5       | 177.5        | 7       |
| 175         | 182.5        | 7.5     |

The data illustrates the relationship between stock price, strike price, and the resulting payoff for a call option. So, when the underlying asset price increases above the strike price, the payoff stands for the gain from exerting the option. One example of this is when the stock price is \$164 and the strike price is \$167, the payoff is \$3 which is earning or gross profit. Consequently, the profit will transform too, with \$7.5 at the end of the day if the stock price hits the mark at \$175 and the strike price at \$182.5. Such progressive returns highlight the fact that the premium that one is paying for the option is a good investment considering the stock price goes higher than the strike price.

Graph

### **c) Construction of a Straddle for Airbnb, Inc.:**

The model of a straddle for Airbnb, Inc. is formed by buying both an In-The-Money (ITM) call option and the ITM put option with the same strike price and the same expiration date. This approach takes into consideration the high volatility of pricing and it also does not mind the direction of the asset price movement. Let's explore the process and implications of constructing a straddle for Airbnb: Let's explore the process and implications of constructing a straddle for Airbnb:

Firstly, the right strike price should be set. Per Airbnb, the straddle of the underlying asset with a strike price of 165 dollars now, which is equal to the market price, shall be considered. Normally, the ending date is adjusted to match the mood of the investment horizon, which is usually at the end of the three-month volatile period.

Lastly, we estimate the profit diagram of both the ATM calls and ATM puts. The payoff of the call option is shifted to the positive direction as the stock price deviates from \$165 more. Take the case where the stock price is \$147, which is far less than \$165, the call option can pay off by \$3 hence a profit. Playing a different role, if the stock price rises to \$217 then \$2 of the payoff will be retained. Analogously, the payoff of a put option increases as the stock price diverges from that of \$165, plunging to the maximum of \$3 if the product of the stock price and \$164 is zero and decreasing as the stock price moves further away from the strike price.

The technology of constructing a straddle permits investors to benefit from the option of underlying volatility of Airbnb's share price, regardless of the direction of the volatility. In the event that the stock value increases significantly or decreases by the time the option expires, one of the options will be in-the-money, thus, the investor gains profit from the underlying asset's movement. The benefit of such approach is that it is quite potent, especially when there is no clarity on the direction of the price but there is strong belief on the level of expected volatility.

The investors who purchase both the ATM call and put options ensure that they have a low risk exposure to market direction unpredictability. They can potentially trade profitably off huge price differences in either direction without risking more than the initial premium value which initially paid for them. In this manner, straddle strategy also presents the option to the investors to optimize their moves as the respective markets develop over the time thus, the possibilities of enhancing returns or minimizing the risks also become a part and parcel of the overall strategy.

In summary by using straddles for Airbnb, Inc. shareholders are exposed to an optionable mix of hedging and speculation in the face of anticipated stock price movement. Buyers of both call and put options at the same strike price and expiry date put themselves in the position to benefit from a significant move in price either way, though essentially, that is the main income source for the investor, who also effectively implements risk management and uncertainty trading on the market. (U.S. Securities and Exchange Commission, 2023).