

## Case Project 2:

Consider the following situations:

### Situation 1

A stock investor, Mr. B has many of his holdings in a chemical company. The sector has been facing constant pressure due to factors like supply issues and an increase in raw material prices. The stock can be categorized as a mid-cap segment share. Mr. B can be categorized as a Risk-Averse investor (A person who hates taking risks and would only take risks if the risk-reward ratio is favorable).

Due to the uncertainty in the sector, the stock-associated risk has increased and is going beyond the tolerance level of the investor. In a week, the quarter results of the company will be announced, and already the volatility has spiked in the share.

The investors are speculating over the margin improvement and the management guidance of the company as the peers delivered sub-par and poor results. Considering the above situations, the investor is trying to evaluate how he can hedge his position so that when the results get announced and if the results are sub-par, he can restrict his losses, but at the same time, he does not want to lose out on potential gains. His average cost of buying the stock is Rs. 95, and currently, the stock is trading at Rs. 100. An Option is available with a strike price of Rs. 100 and option premium of Rs. 3, slated to expire in a week, coinciding with the result announcement of the company.

Based on the market expectation and volatility, if the company's results are sub-par, then the market price is expected to be around Rs. 90 - 95, while if the results are above expectation, the price is expected to be around Rs. 105 - Rs. 110. The probability of a sub-par result is 0.6, while the probability of an above-par result is 0.4.

Consider the following conditions:

1. Mr. B buys a call option by paying a premium of Rs. 3 with a strike price of Rs. 100.
2. Mr. B buys a put option by paying a premium of Rs. 3 with a strike price of Rs. 100.

For both conditions, create a tree stating a bullish and bearish scenario. Indicate when he would exercise the option and when would let it expire. If possible, share the expected payoff of exercising the option today.

## **SITUATION 1**

Let us break down the scenarios for both buying a call option and buying a put option in the given conditions.

### **Buying a Call Option:**

#### **Bullish Scenario:**

- A) Result is above expectation (Probability: 0.4):

Stock price rises to Rs. 105 - Rs. 110.

Mr. B exercises the call option, buying the stock at the strike price of Rs. 100 and selling it at the market price (Rs. 105 - Rs. 110).

$$\begin{aligned}\text{Payoff} &= \text{Market Price} - \text{Strike Price} - \text{Option Premium} \\ &= (\text{Market Price} - \text{Rs. 100} - \text{Rs. 3})\end{aligned}$$

- B) Result is sub-par (Probability: 0.6):

Stock price stays at Rs. 90 - Rs. 95.

Mr. B lets the call option expire as it is not profitable to exercise.

$$\text{Payoff} = -\text{Rs. 3 (Option Premium)}$$

**Bearish Scenario:**

- A) Result is above expectation (Probability: 0.4):

Stock price rises to Rs. 105 - Rs. 110.

Mr. B exercises the call option, buying the stock at the strike price of Rs. 100 and selling it at the market price (Rs. 105 - Rs. 110).

$$\begin{aligned}\text{Payoff} &= \text{Market Price} - \text{Strike Price} - \text{Option Premium} \\ &= (\text{Market Price} - \text{Rs. 100} - \text{Rs. 3})\end{aligned}$$

- B) Result is sub-par (Probability: 0.6):

Stock price stays at Rs. 90 - Rs. 95.

Mr. B lets the call option expire as it is not profitable to exercise.

$$\text{Payoff} = -\text{Rs. 3 (Option Premium)}$$

**Buying a Put Option:****Bullish Scenario:**

- A) Result is above expectation (Probability: 0.4):

Stock price rises to Rs. 105 - Rs. 110.

Mr. B lets the put option expire as it's not profitable to exercise.

$$\text{Payoff} = -\text{Rs. 3 (Option Premium)}$$

- B) Result is sub-par (Probability: 0.6):

Stock price stays at Rs. 90 - Rs. 95.

Mr. B exercises the put option, selling the stock at the strike price of Rs. 100 and buying it back at the market price (Rs. 90 - Rs. 95).

$$\begin{aligned}\text{Payoff} &= \text{Strike Price} - \text{Market Price} - \text{Option Premium} \\ &= (\text{Rs. 100} - \text{Market Price} - \text{Rs. 3})\end{aligned}$$

**Bearish Scenario:**

- A) Result is above expectation (Probability: 0.4):

Stock price rises to Rs. 105 - Rs. 110.

Mr. B lets the put option expire as it's not profitable to exercise.

Payoff = -Rs. 3 (Option Premium)

B) Result is sub-par (Probability: 0.6):

Stock price stays at Rs. 90 - Rs. 95.

Mr. B exercises the put option, selling the stock at the strike price of Rs. 100 and buying it back at the market price (Rs. 90 - Rs. 95).

Payoff = Strike Price - Market Price - Option Premium  
= (Rs. 100 - Market Price - Rs. 3)

### Conclusion:

In both scenarios (buying a call option or buying a put option), Mr. B would exercise the option only when the stock price goes against the direction he expected (sub-par results). In the other scenario (above expectation results), he would let the option expire.

#### Situation 2

ABC Ltd is a trading company in India which deals in plastic manufacturing. They source their material from China and sell it in the USA and European Union. Material sourcing is done in Yuan, and sales are done in Dollars and Euros. As their business is international, they are exposed to currency fluctuations and currency risk on both the purchasing and sales sides. The typical business cycle of the company is:

Day 1: ABC Ltd. orders with the Chinese vendor and pays 30%.

Day 30: The Chinese vendor loads cargo, and ABC Ltd makes 70% of the payment to the Chinese vendor.

Day 45 - 50: ABC Ltd. receives orders from US and European customers for its products and gets 10% as advance payment.

Day 60: The goods are received in India

Day 90: Goods are shipped to US and Europe after value addition at ABC Ltd's factory near Mumbai

Day 135: Goods are delivered in Europe, and the balance of 90% of the payment is received

Day 180: Goods are delivered in the US, and the balance 90% of payment is received

The finance team of the company is trying to work out a plan of action or strategy to use futures & options to mitigate the currency risk associated with the business. Please point out the various points in the business model where the company is exposed to currency risk. Kindly suggest suitable futures or options instruments that can be used to mitigate the same.

## SITUATION 2

ABC Ltd. is exposed to currency risk at various stages of its business cycle. Here are the key points where the company faces currency risk and potential strategies using futures and options to mitigate these risks:

**Day 1: Placing Orders with Chinese Vendor (Yuan Exposure):**

Currency Risk: The company is exposed to fluctuations in the Yuan when placing orders with the Chinese vendor.

Mitigation Strategy: ABC Ltd. can use currency futures to hedge against the risk of Yuan appreciation. They can lock in a favourable exchange rate for the future purchase of materials.

**Day 30: Payment to Chinese Vendor (Yuan Exposure):**

Currency Risk: The company is exposed to changes in the Yuan's value between the time of order placement and the final payment to the Chinese vendor.

Mitigation Strategy: Like Day 1, ABC Ltd. can use currency futures to hedge against fluctuations in the Yuan. They can lock in a rate that protects them from adverse movements.

**Day 45 - 50: Receiving Orders in USD and Euros (USD/EUR Exposure):**

Currency Risk: Fluctuations in USD and Euro exchange rates can impact the revenue in local currency terms.

Mitigation Strategy: ABC Ltd. can use currency options to hedge against the risk of USD and Euro depreciation. Options provide flexibility, allowing the company to benefit from favourable exchange rate movements while limiting downside risk.

**Day 60: Receiving Goods in India (Yuan Exposure):**

Currency Risk: The company is exposed to fluctuations in the Yuan when receiving goods in India.

Mitigation Strategy: Like the earlier stages, ABC Ltd. can use currency futures to hedge against Yuan risk associated with receiving goods.

**Day 90: Shipping Goods to US and Europe (USD/EUR Exposure):**

Currency Risk: Fluctuations in USD and Euro exchange rates can impact the revenue in local currency terms.

Mitigation Strategy: ABC Ltd. can use currency options or futures to hedge against the risk of USD and Euro depreciation during the shipment period.

**Day 135 & Day 180: Receiving Payments in Europe and US (USD/EUR Exposure):**

Currency Risk: Exchange rate fluctuations can impact the value of payments received in USD and Euros.

Mitigation Strategy: ABC Ltd. can use currency options or futures to hedge against the risk of USD and Euro depreciation. This ensures that the company receives a predictable amount in its home currency.

It is important for ABC Ltd. to carefully analyse the currency risk exposure at each stage and consider a mix of futures and options strategies based on their risk tolerance, market outlook, and specific business requirements. Additionally, they may seek advice from financial experts to tailor the hedging strategy to their unique circumstances.