Quadrant II - Notes

Programme: Bachelor of Arts (Second Year)

Subject: Economics

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Paper Title: Financial Economics-II

Unit: 3

Module Name: OPTIONS – Definition, Types and Solutions

Module No: 16

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Options

- An option is a contract that gives the buyer an option to buy or sell an underlying asset, at a predetermined price on or before a specified date in future.
- An underlying asset(s) that can be purchased or sold is/are stocks, bonds, currency, commodity etc.
- The price which is predetermined is called '*strike price'* or '*exercise price'.*

Important Terms

1. Strike Price/Exercise Price - Price at which asset may be brought or sold.
2. Expiration Date - Last date on which option may be exercised.
3. American Option - In an option contract, if the option can be exercised at any time between the writing of the contract and its expiration, it is called as an American Option.
4. European Option - If the option is exercised only at the time of maturity, it is termed as European option.
5. Writer - In an options contract, the seller is usually referred to as a '*writer' since* he is said to write the contract. In an option contract, the buyer has to pay a certain amount at the time of writing the contract for enjoying the right to buy or sell.

Options Market

- Options market refers to the market where option contract are bought and sold.
- Once an option contract is written, it can be bought and sold on the options market.
- The first option market namely **Chicago Board of Options Exchange** was set up in 1973.
- Thereafter, several options markets have been established.

Types of Options

- **Call Option**

- A Call Option is one which gives the option holder the **right to buy** an underlying asset at a predetermined price on or before the specified date in future.
- In such a case, the writer of a call option is under an obligation to sell the asset at the specified price, in case the buyer exercises his option to buy.
- Thus, the obligation to sell arises only when the option is exercised.

- **Put Option**

- A Put Option is one which gives the option holder the **right to sell** an underlying asset at a predetermined price on or before a specified date in future.
- It means that the writer of a put option is under an obligation to buy the asset at the exercise price provided the option holder exercises his option to sell.

- **Double Option**

    - A Double Option is one which gives the option holder **both the rights – either to buy or to sell** an underlying asset at a predetermined price on or before a specified date in future.

- **In the Money Option (ITM)**

- An ITM is an option which gives **positive cash flow** to the holder if it were exercised immediately.
- This can happen only when the **current index is higher than the strike price in the case of a call option**.
- In other words, a call option on the index is said to be ITM when the spot price, i.e., the current index is higher than the strike price.
- Suppose the current index is much higher than the strike price, the call is said to be **deep In The Money Option**.
- The opposite is for put option.
- A Put Option is said to be In the Money Option if the current index is lower than the strike price.

- **At the Money Option (ATM)**

- An ATM is one which gives a **zero cash flow** to its holder if it were exercised immediately.
- An option on the index is deemed to be At the Money Option when the **current price is equal to the strike price.**

- **Out of the Money Option (OTM)**

- If the immediate exercise of an option gives a **negative cash flow** to its holder, that option is said to be an OTM.
- Thus, a call option on the index is OTM when the **current index is lower than the strike price**.
- The reverse is the case of put option.
- The put option is said to be Out of the Money Option if the **current index is higher than the strike price.**

SOLUTIONS

The call option holder's opportunity to make profits is **unlimited**. It depends on what the actual market price of the underlying share is when the option is exercised. The greater is the market value of the underlying asset, the larger is the value of the option.

The call buyer's potential pay-off becomes unlimited, once the price of the share (underlying asset) goes beyond the exercise price. If the share price is on or below the exercise price, the call buyer will not exercise his option. Thus, his pay-off will be zero, since the option is worth nothing.

1. <u>Pay-off of a call option buyer</u>

- It may be observed from figure 1 that the possible outcomes can be divided into two parts: one above the exercise price and other below, the exercise price.
- The outcomes above the exercise price are said to be in-the-money and are beneficial to the option holder but not the outcomes below the exercise price.
- It is the exercise price that divides the good and bad outcomes.

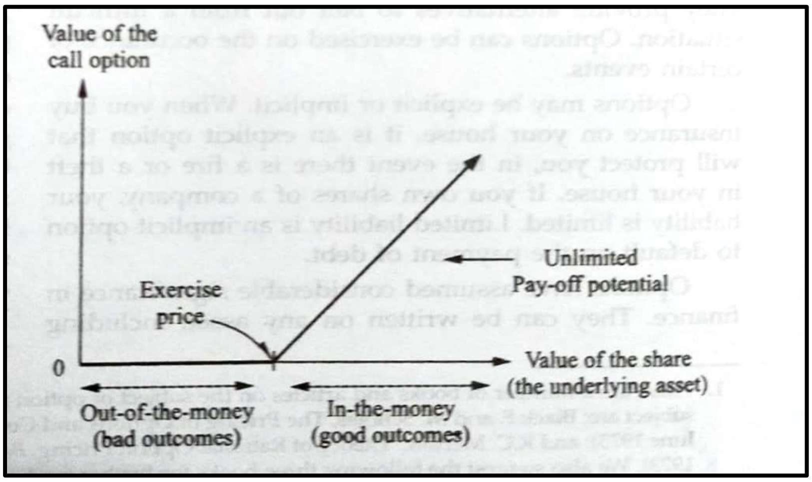

Figure 1

2. <u>Pay off of a call option writer</u>

- Figure 2 shows the mirror image of the call buyer's position.
- **The call the buyers gain is called seller's loss.**
- The seller of the call option will not incur any loss when the price of the share (the underlying asset) is less than the exercise price since the buyer will not exercise his option.

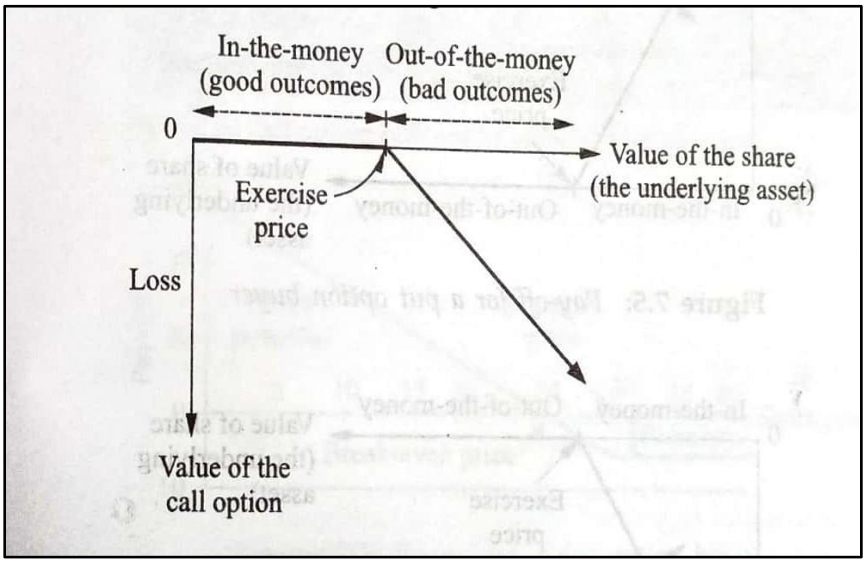

Figure 2

However, if the share price rises and goes beyond the exercise price, the potential loss of the call seller is very high.

3. Pay off for a put option buyer

- Figure 3 shows that the value of the put option for the holder depends on the value of the underlying asset.
- The value of the put option is zero when it is out-of-the-money.
- It can be noticed in figure 3 that the potential profit of the put option buyer is limited, since share price cannot fall below zero.

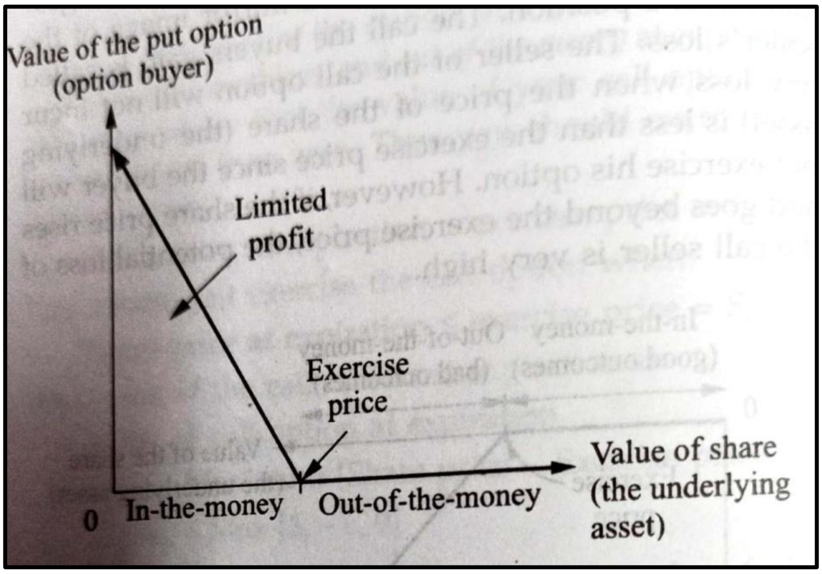

Figure 3

- The exercise price is again the dividing point between the good and bad outcomes.
- **The put option buyer's gain is the seller's loss.**
- The seller insures the buyer from the bad outcomes.

4. Pay off for a put option seller

- Figure 4 shows the pay-off of the seller of a put option.
- It should be clear from figure 4 that the potential loss of the put-option seller is limited to the exercise price.
- Since the buyer has to pay a premium to the seller for purchasing a put option.
- The potential profit of the buyer and the potential loss of the seller will be reduced by the amount of premium.

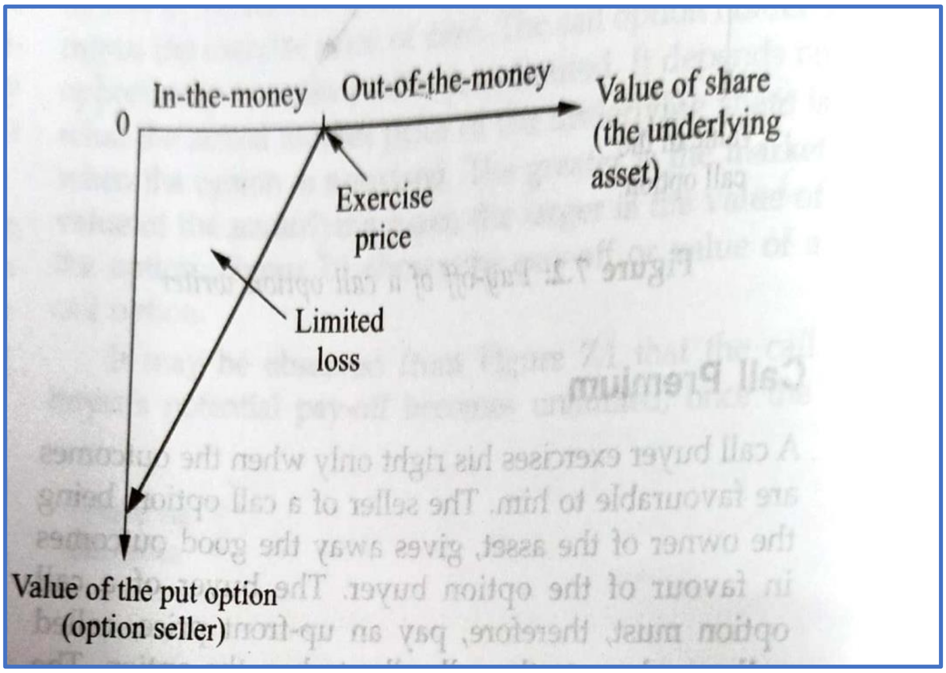

Figure 4

Note:

- The figures used in this module (Figure 1,2,3 and 4) are taken from Pandey I.M. (2015) Financial Management, 11th Edition, Vikas Publishing House Pvt. Ltd. New Delhi.