ICON VALUATION

ESOP VALUATIONS

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Our Journey Today

- Introduction to Options & ESOPs
- Valuation of ESOPs
- Ind AS 102 Key Guidance
- Concept Checker

INTRODUCTION TO OPTIONS & ESOPs

Introduction to Options

- **Derivative Instruments** are instruments that derive their value from some other underlying instruments

- **Options** are derivative instruments / contracts that:
  - ✓ Give the owner/buyer
  - ✓ **A right but not an obligation**
  - ✓ To either buy or sell
  - ✓ A specified underlying asset
  - ✓ At a specified price
  - ✓ At or within a specified time

Hence Value of Option for the Holder CANNOT BE LESS THAN ZERO

- In case of **Employee Stock Options (ESOPs)**, the right is given to certain specified employees to subscribe to the underlying equity shares of the company at a specified price at or within a specified time subject to certain vesting conditions

Categories of Options

By Type — **CALL** option vs. **PUT** option

By Exercisability — **AMERICAN** option vs. **EUROPEAN** option

By Payoffs — **IN** the money vs. **AT** the money vs. **OUT** of the money

ESOPs – Which Category?

By Type — **CALL** option

By Exercisability — Generally **AMERICAN** option, but with conditions

By Payoffs — Generally granted **IN** the money

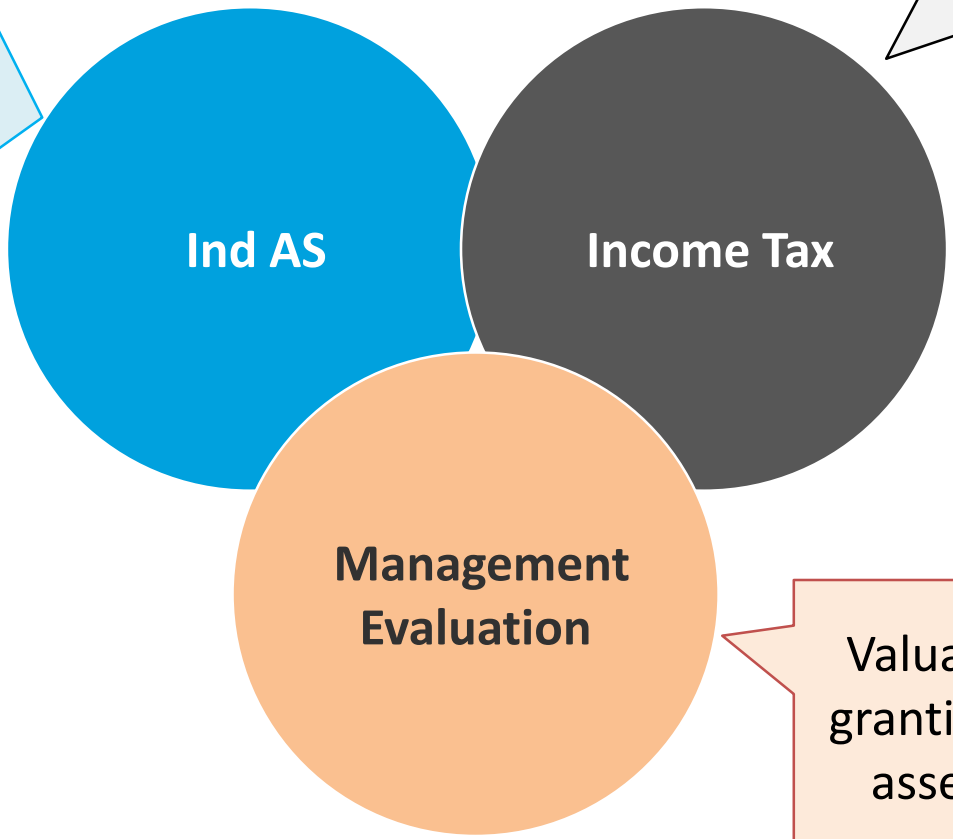
Key Terms related to ESOPs

VALUATION OF ESOPs

When are ESOP Valuations required?

Generally required at the time of Grant

Also at each reporting date in case of cash settled options

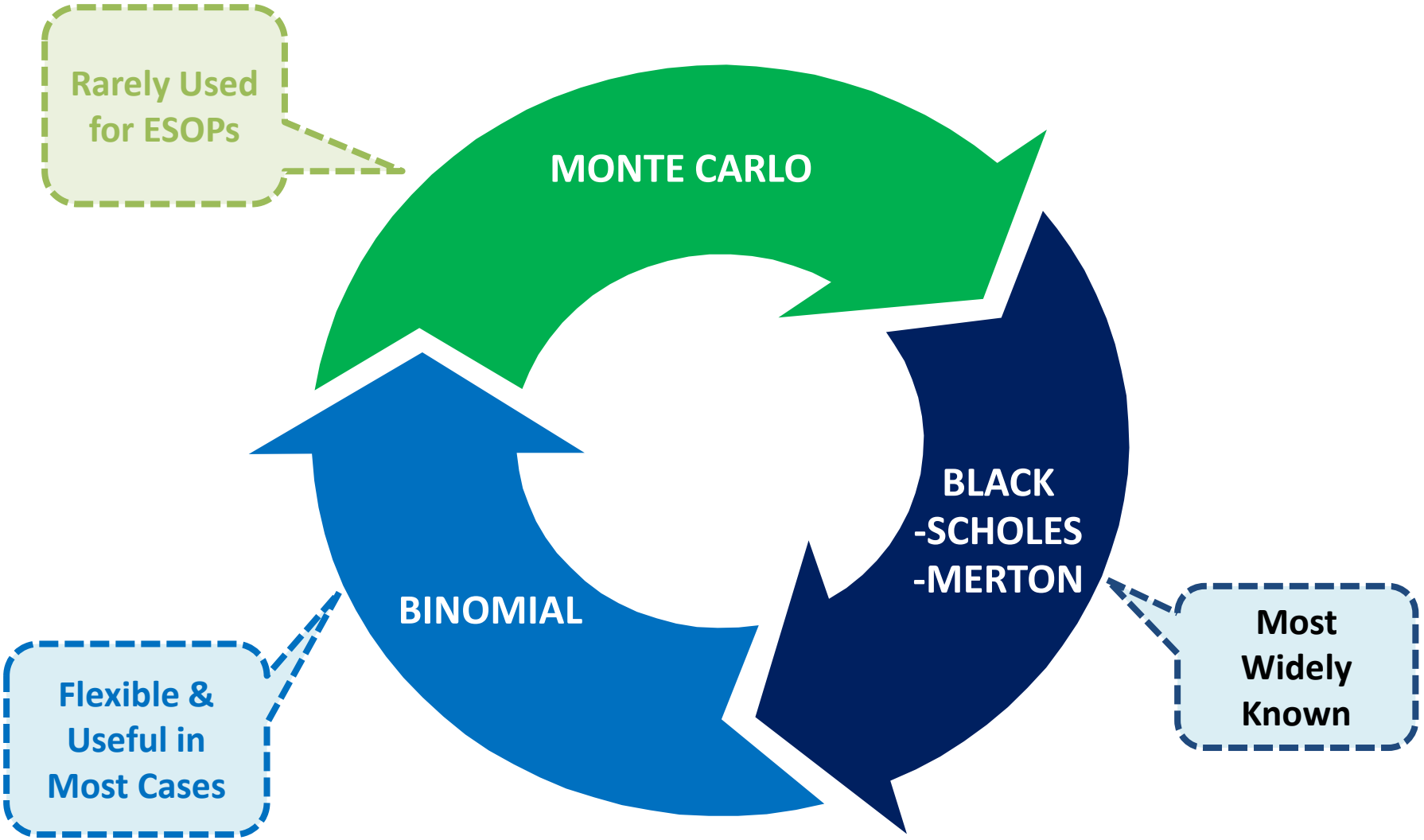


Valuation of shares (not options) required by merchant banker

Benefit treated as Perquisite

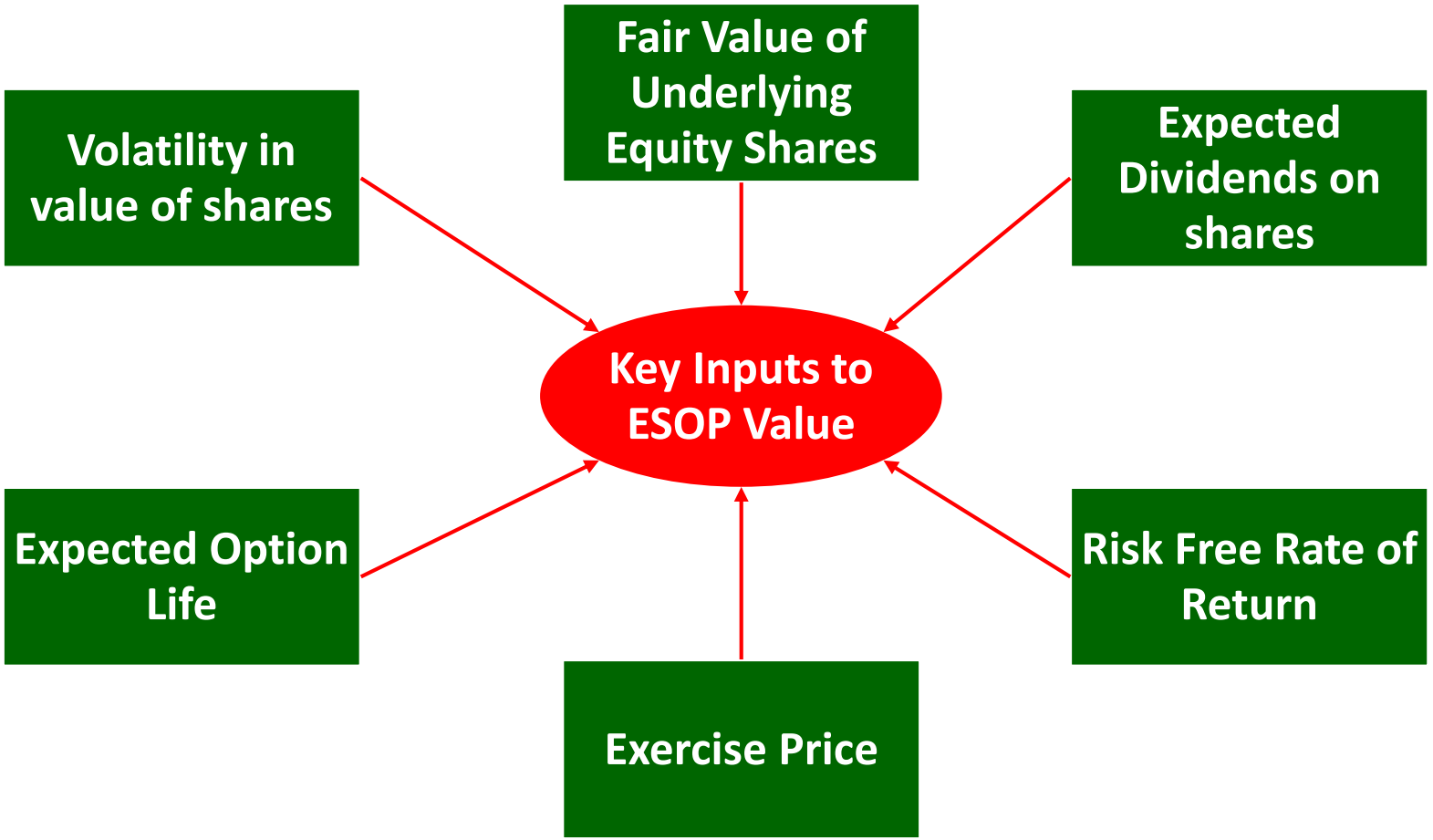
Valuation before granting ESOPs to assess impact

Valuation Methods



Inputs for ESOP Valuation

For Both Models



Inputs for ESOP Valuation

Fair Value of Underlying

- This represents the fair value of the equity shares of the Company
- Required as at the Valuation Date which is usually the Grant Date
- If shares are listed:
  - ✓ Available market price can be considered
  - ✓ To check for sufficient trading
  - ✓ Generally the price from the stock exchange with the highest volume is considered
- If shares are unlisted:
  - ✓ Need to undertake valuation of equity shares based on generally accepted methods like market multiples, discounted cash flows, etc.
  - ✓ Care to be taken to ensure value is minority level and not control level

Inputs for ESOP Valuation

Exercise Price

- Usually this is a fixed number and forms part of the ESOP Scheme or Grant Letter
- In some cases, companies choose to keep exercise price at minimal level say Re. 1/-. In such cases value of option will be higher
- In certain rare cases, exercise price could be a variable number – linked to share price, performance, time period, etc. In such cases this may have to be separately built into a binomial

Inputs for ESOP Valuation

Expected Option Life

- This represents the expected life of the option considering the following factors:
  - ✓ Grant date
  - ✓ Vesting date / period
  - ✓ Exercise period
  - ✓ Expiration date
  - ✓ Expected early exercises during the eligible period if supported by history

- This may also require weighted average computation for different vesting patterns within the same ESOP scheme

Inputs for ESOP Valuation

Expected Option Life – Example 1

- Example:
  - ✓ Grant Date = 1st April 2018
  - ✓ Vesting period = 1 year
  - ✓ Exercise period = 10 years from vesting date
- Solve:
  - ✓ Expected Exercise Date = ? 1st April 2029
  - ✓ Expected Option Life = ? 11 years from grant date
    But could be lower in case of early exercise history

Inputs for ESOP Valuation

Expected Option Life – Example 2

- Example:
  - ✓ Grant Date = 1st April 2018
  - ✓ Vesting period = 1 year for 50% options, 2 years for balance 50% options
  - ✓ Exercise period = 10 years from vesting date
- Solve:
  - ✓ Expected Exercise Date = ? 1st October 2029 [weighted average]
  - ✓ Expected Option Life = ? 11.5 years from grant date [weighted average]
    But could be lower in case of early exercise history

Inputs for ESOP Valuation

Expected Volatility

- This represents a measure of expected level of fluctuation in the value of equity shares
- Measured using standard deviation as a basis
- If shares are listed, then their volatility can be computed directly
- If shares are unlisted, then generally volatility is computed for shares of comparable companies and then used as a proxy
- Historical volatility analysis is usually performed for similar time period as the future expected option life considered in the option valuation model

Inputs for ESOP Valuation

Expected Dividends

- This represents the level of dividends that could be expected on the equity shares of the company
- If there is a dividend history in the company, then the same could be directly considered
- In the absence of dividend history, generally dividend history of comparable companies is analysed and considered
- Historical dividend analysis is usually performed for similar time period as the future expected option life considered in the option valuation model
- Dividend Yield is considered as % to fair value [not as % to face value]

Inputs for ESOP Valuation

Risk Free Rate

- This is usually based on government bond yields
- Required as at the Valuation Date which is usually the Grant Date
- The tenure of government bonds considered is usually matched similar to the future expected option life considered in the option valuation model

Black-Scholes-Merton

- Developed by three economists – Fischer Black, Myron Scholes and Robert Merton
- Is most widely known option pricing model
- Key assumptions of the model:
  - ✓ The option is a European style option which can be exercised only at the end
  - ✓ Model assumes the log normal property of stock prices i.e. the % changes in the stock prices are normally distributed.
  - ✓ No equity dividends factored in the original model (but the model this has been later refined to incorporate equity dividends)

Black-Scholes-Merton

- Formula is complex. It is recommended to instead use online option calculators available.

$$C = SN(d_1) - N(d_2)Ke^{-rt}$$

C = Call premium
S = Current stock price
t = Time until option exercise
K = Option striking price
r = Risk-free interest rate
N = Cumulative standard normal distribution
e = Exponential term

s = St. Deviation
ln = Natural Log

$$d_1 = \frac{\ln\left(S/K\right) + \left(r + s^2/2\right)t}{s \cdot \sqrt{t}}$$

$$d_2 = d_1 - s \cdot \sqrt{t}$$

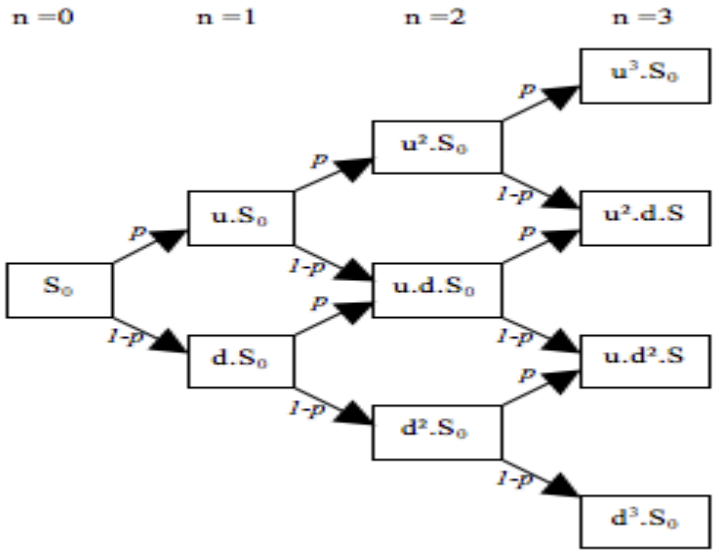
- A simple interpretation could be representative of the present value of the expected payoff of the option at expiration.

Binomial

- More flexible than Black-Scholes-Merton
- Key assumptions of the model:
  - ✓ The option is a American style option which can be exercised at any time up to the expiration
  - ✓ Model assumes the binomial distribution of stock prices. Basic premise is that at any given point in time the share price can move in 2 directions to 2 different possible outcomes
  - ✓ Involves creation of various nodes over different time intervals
  - ✓ At each node, it calculates expected share price and expected option value

Binomial

- Building a binomial tree could be complex. It is recommended to instead use online option calculators available.



- A simple interpretation could be representative of the present value of the weighted option values at each node.

ESOP Valuation

Example

Valuation Date	01-Apr-18
ASSUMPTIONS	
Fair Value per equity share (INR)	100.0
Exercise Price per equity share (INR)	30.0
Expected Option Life (Years)	10.0
Volatility (%)	25.0%
Dividend Yield (%)	1.0%
Risk Free Rate (%)	8.0%
ESOP Value per equity share - Black & Scholes (INR)	**76.9**
ESOP Value per equity share - Binomial (INR)	**77.7**

ESOP Valuation Sensitivity

Example

Valuation Date	01-Apr-18	01-Apr-18	01-Apr-18	01-Apr-18	01-Apr-18	01-Apr-18	01-Apr-18
ASSUMPTIONS							
Fair Value per equity share (INR)	100.0	▲ 120.0	100.0	100.0	100.0	100.0	100.0
Exercise Price per equity share (INR)	30.0	30.0	▲ 50.0	30.0	30.0	30.0	30.0
Expected Option Life (Years)	10.0	10.0	10.0	▲ 12.0	10.0	10.0	10.0
Volatility (%)	25.0%	25.0%	25.0%	25.0%	▲ 30.0%	25.0%	25.0%
Dividend Yield (%)	1.0%	1.0%	1.0%	1.0%	1.0%	▲ 2.0%	1.0%
Risk Free Rate (%)	8.0%	8.0%	8.0%	8.0%	8.0%	8.0%	▲ 9.0%
ESOP Value per equity share - Black & Scholes (INR)	**76.9**	▲ 94.9	▼ 68.2	▲ 77.1	▲ 77.1	▼ 68.3	▲ 78.1
ESOP Value per equity share - Binomial (INR)	**77.7**	▲ 96.2	▼ 68.7	▲ 78.3	▲ 78.1	▼ 72.4	▲ 78.8

IND AS 102
KEY GUIDANCE

Ind AS 102

Key Guidance

- Model to be used

  - ✓ ESOPs are usually exercisable anytime during the exercise period. Hence, Binomial model may be more suitable for such cases.

  - ✓ In case of ESOPs which are exercisable only at the end, Black-Scholes-Merton should be used, or else this feature should be suitably adjusted in the Binomial model.

  - ✓ However, where exercise periods are relatively short, both models may give similar results.

Ind AS 102
Key Guidance

- Life

  - ✓ If early exercise is expected, then the same can be factored into the life input used in the option pricing model

  - ✓ Past history of average length of actual exercise to be seen

  - ✓ Grouping of employees with similar expected exercise pattern, and considering weighted average life for the group of employees

Ind AS 102
Key Guidance

- Volatility

  - ✓ Past history may not be always reflective of future Eg. Past stock prices may be highly volatile due to takeover bid or risky business sold off later. Such extraordinary periods can be ignored in the computation

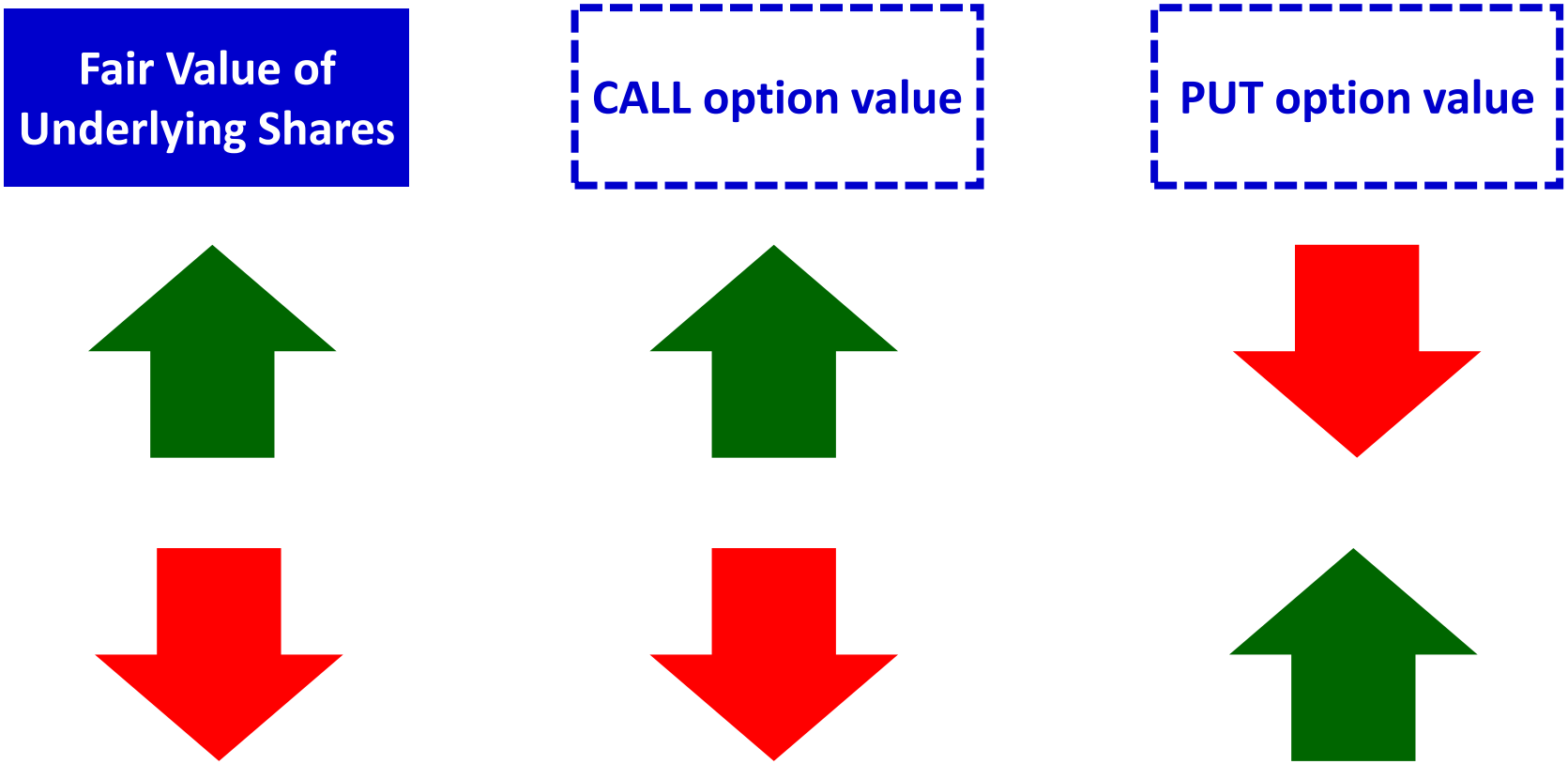
- Dividends

  - ✓ Historical pattern of increases, if any, to be factored in future estimates
  - ✓ Past may be nil, but company may have plans for future dividends
  - ✓ If employees are eligible for equivalent dividends even during the vesting period, then dividend not to be considered in option pricing model

CONCEPT CHECKER

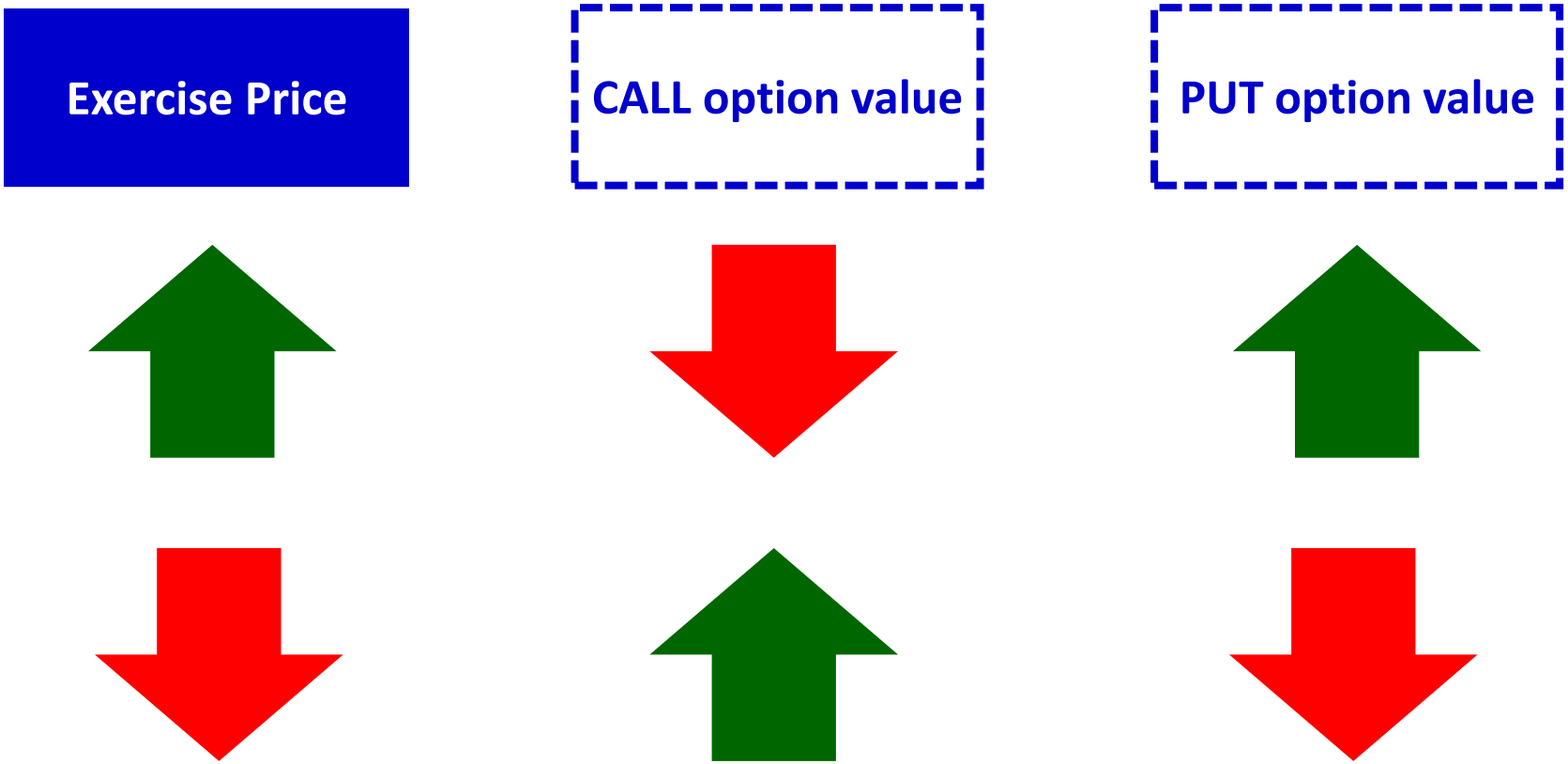
Correlation Trends

Fair Value of Underlying Shares



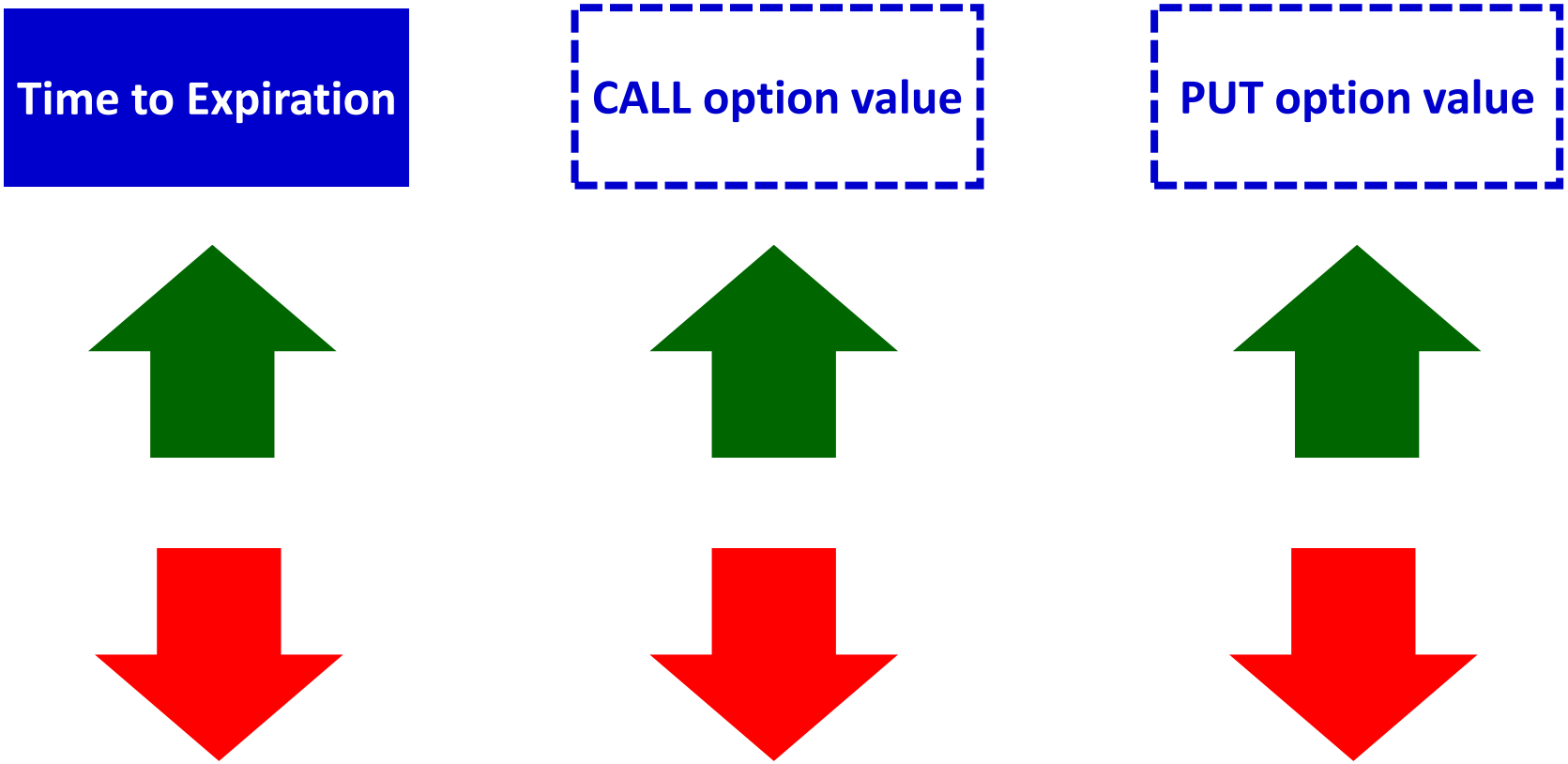
Correlation Trends

Exercise Price



Correlation Trends

Time to Expiration



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