ESOP VALUATIONS

EMPLOYEE BONANZA FOR WEALTH CREATION

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APRIL 2021

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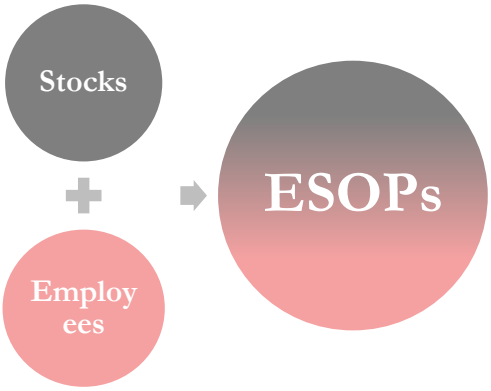
BACKGROUND

In the past couple of decades, as a part of the employees' compensation packages, firms are increasingly providing employee options and restricted stocks. Although, this trend emerged with the rise of startups in the country who were not able to pay cash-based compensation to their employees, larger firms have used this option to align the interest of their employees with that of the shareholders.

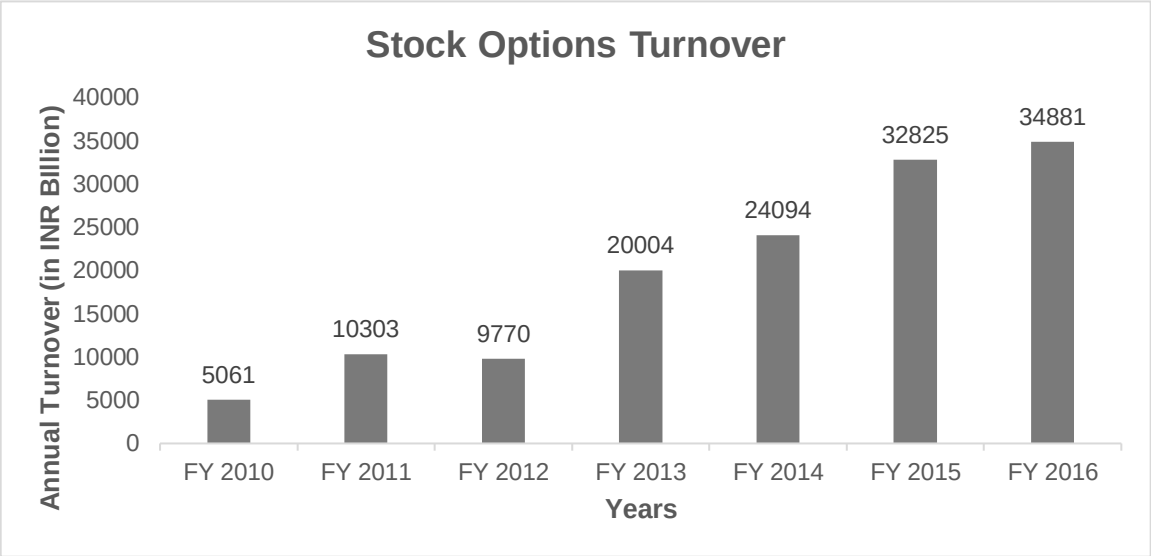
Sec 2(37) of Companies Act, 2013 defines "employees stock option" which means, 'the option given to the directors, officers or employees of the company or of its holding company or subsidiary company or companies, if any, which gives such directors, officers or employees, the benefit or right to purchase, or to subscribe for, the shares of the company at a future date at a pre-determined price.'



This provision needs to be read with Rule 12 of The Companies (Share Capital and Debentures) Rules, 2014

Market Data

According to study by Statista, the annual stock options turnover from FY 2010 through FY 2016 has increased from INR 5,061 billion to INR 34,881 billion. Most of the turnover goes to the unicorns which started increasing after FY 2012 in India. The growth in the equity options can also be shown with the help of options overhang. An option overhang is the number of employee options outstanding as a percentage of total shares outstanding.



Which companies use options?

According to a study by the Investor Responsibility Research Center (IRRC), technology companies have the biggest overhang of 24.4% in 2003 and the utility companies have the smallest amounting to less than 8%. There are variety of reasons why these differences exist between sectors which may include a non-exhaustive list of the following:

i) Age and Growth Potential of a firm impacts the use of ESOPs to a large extent. The younger companies or the startups use the equity options more when compared with more mature companies because the younger companies might not have sufficient amount of funds to compensate their employees at their embryonic stage.

ii) Riskiness of a firm may affect the use of ESOPs as a riskier firm will use equity options more frequently than a less risky firm which has a stable cash flow pattern.

iii) There is also a tax advantage that the firms get while using the ESOPs in their employee compensation plan.

The objective of this Standard is to specify the financial reporting by an entity when it undertakes a **share-based payment transaction**. In particular, it requires an entity to reflect in its profit or loss and financial position the effects of share-based payment transactions, including expenses associated with transactions in which share options are granted to employees.

Binomial model is more suitable for cases where ESOPs are exercisable anytime during the exercise period. In cases where ESOPs 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.

If the early exercise of the option is expected, this factor should be taken into account for computing the value of the option. A group of employees should be created on the basis their exercise pattern and then the weighted average life can be determined.

In case of volatility, past history might not necessarily reflect the future volatility pattern of the stock. Also, any extraordinary periods such as in case of takeover bids or any unit sale of the business should be ignored while computing the volatility.

Any increase in the pay-out rate of dividend should be factored to account for future estimates. Note that if the employees are eligible for dividend payments during the vesting period, then such dividends should not be considered for ESOP valuation.

ESOP Valuation Methods

- Black-Scholes Merton Model (Most-widely used model)
- Binomial Model (More flexible and can be used in various scenarios)
- Monte Carlo Simulation (Not widely used model)

Black-Scholes Merton Model: The model estimates the variation over time of the underlying stock, and derives the price of the Option using the implied volatility of the underlying stock. The formula for computing the value of an option using BSM Model is; $\text{Option Value} = S \times N(d_1) - Xe^{-rt} \times N(d_2)$

Wherein; 'S' is the fair value of equity shares;

'N' is the value of cumulative normal distribution

$$d_1 = \frac{\ln\left(\frac{S}{X}\right) + \left(r + \frac{\sigma^2}{2}\right)t}{\sigma \times \sqrt{t}}$$

$$d_2 = d_1 - \sigma \times \sqrt{t}$$

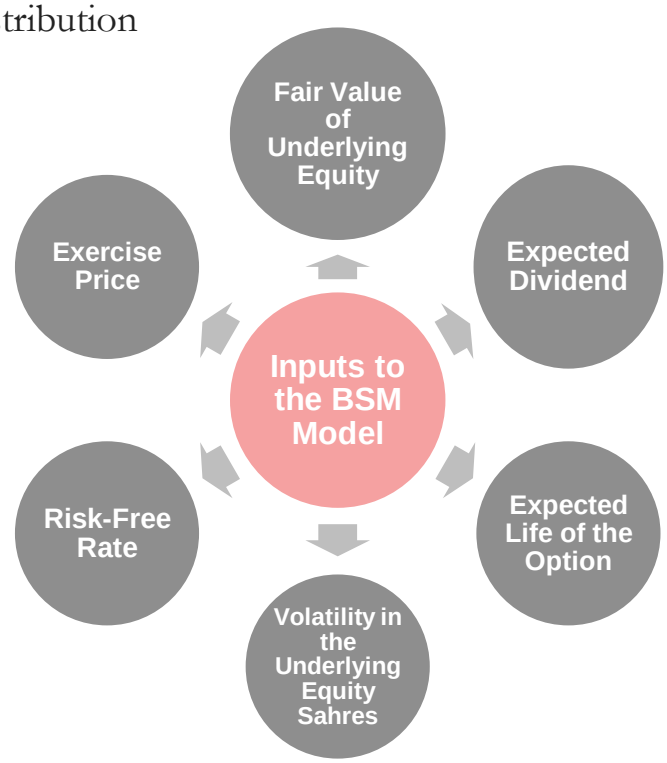
'X' is the exercise value,

'ln' is the natural log,

'r' is the risk-free rate,

't' is the expected life of the option and,

'σ' is the expected volatility in the stock



- The fair value of the equity shares of the company is required on the valuation date, which is usually the grant date. Although the value of the stock can be determined using either using the formula provided by Section 56 of the Indian IT Act or by using the DCF approach. According to the IT Act, the fair value of equity shares is determined using the formula: $\text{Fair Market Value} = (\text{BV of Assets} - \text{BV of Liabilities}) \times \frac{PV}{PE}$

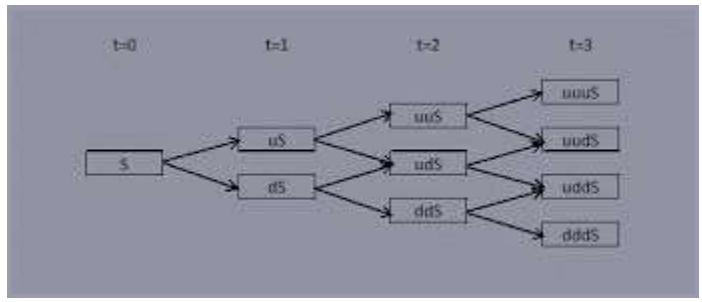
Wherein; 'PV' is the paid-up value of equity shares and 'PE' is the paid-up amount shown in the balance sheet.

- The number of shares will increase as the options are issued; thereby, resulting in the stock price to decrease. A simple adjusted stock price can then be determined using the following formula:

$$\text{Adjusted Stock Price} = \text{Current Stock Price}\left[\frac{n_{\text{Shares Outstanding}}}{n_{\text{Shares Outstanding}} + n_{\text{Options}}}\right]$$

  As a result, the decreased stock price tends to decline the value of the option.
- The life of an option will be affected when these options are granted because of illiquidity. Since the options granted to the employees cannot be traded, the employees are only wealthy on paper. Due to this reason, the employees are induced the exercise the options early and forgo any time premium that they would have received. As a consequence, the value of the option will decrease due to reduced life.
- The expected volatility measures the level of fluctuations in the value of the underlying equity shares. This input can be measured with the help of standard deviation or beta. If the company's shares are listed, then their volatility can be directly computed. However, in case of an unlisted company, the volatility of comparable companies is taken and used as a proxy for the subject company.
- The risk-free rate is generally the government bond yield. It is taken on the grant date of the ESOP. The tenure of the bond yield is generally taken to be equivalent to the expected life of the option.
- An adjustment for the probability of vesting should be done wherein this probability will then be multiplied with the value of option to ascertain the expected value for the same.
- The companies can have a tax benefit on issuing stock options because the difference between the stock price and the exercise price can be treated as an expense for the purpose of tax deduction. Thus, it helps in reducing the drain on the value created by issuing options.

Binomial Model: This model is more flexible than the BSM Model because it not only allows flexibility to adjust for the early exercise, but also to allow factoring of the vesting period. The binomial model assumes that the option is American Style (it can be exercised any time before maturity), the share price only moves in two directions, it involves the creation of various nodes at different time intervals and at each node, the expected share price and the expected value of the option is calculated. Although there could be hundreds of possible variations in the stock price, which could result in creation of a decision tree, the value of the option computed through this model comes closer to that from the Black-Scholes Merton Model.



In a simplistic way, the value of an option can be determined with the help of a single stock price (S) at a particular time (let's say t = 0). Now, the probability of an upward move in the stock price gives an up factor (u) and the probability of a downward move gives a down factor (d). Once these up and down factors are multiplied with the stock price, the stock price at the future time period (let's say t = 1) will be determined. In a similar way, numerous nodes determining the stock price at future time period will be computed and a binomial tree will be constructed.

Now, the main question comes, as how can we determine the value of an option?

- Once a decision tree is prepared, the risk neutral probabilities (π) for up and down movements are computed. The formula for the same is;

  $$\pi = \frac{(1 + tr) - d}{u - d}$$

  Wherein; 't' is the life of the option, 'r' is the risk-free rate, 'd' is the down factor and 'u' is the up factor.
- Also, compute the value of the call option when the time period t = 1 when there is an up move (C^+) and a down move (C^-) by taking the maximum of zero or the excess of stock price (S) over the strike price (X).
- Finally, the expected value of the call option (C_0) can be estimated using this formula;

  $$C_0 = \frac{\pi \times C^+ + (1 - \pi) \times C^-}{(1 + r)}$$

Market Reaction to ESOPs

An argument can be made on how the market reacts to the issuance of ESOPs by a listed company. This can be viewed from three dimensions:

1) **What is the reaction of the market at the time when ESOPs are granted?** It is not evident that the issue of ESOPs in itself bad news for the market because even if the companies did not grant ESOPs it could now do so because it is the normal cost of doing business now a days. Thus, it shouldn't be taken either as a good or the bad news by the market.

2) **How does the market react when the options are exercised?** As per the data captured by Garvey and Milbourn in 2002, the market reacts negatively to the option exercise associated dilution. This means that the market did not fully incorporate the option overhang and ideally in an efficient market, the potential dilution of stock at the time of exercising the option should be a non-event with no stock price consequence.

3) **Does the market incorporate the option overhang when valuing equity in a publicly traded company?** The market price has been seen to be lower for the companies whose overhang is high (usually about 6%). Thus, any adjustment to ESOPs in valuation yields a value which is pretty much closer to the market price. Hence, it can be argued that the market considers the value of outstanding options at the time of company valuation.

About the Author:

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