Institute of Actuaries of India

ESOP Valuation – An Overview

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10th Seminar on Current Issues in Retirement Benefits

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Indian Actuarial Profession

Serving the Cause of Public Interest

Outline

1. **Growth and History - US GAAP, IFRS, Indian GAAP**
2. ESOP accounting practices of large Indian companies
3. Valuation Models
4. Choosing the Models
5. Assumption setting
6. Criticisms of the Models
7. Disclosure requirements
8. Greater Challenges
9. Conclusion

Growth and History of Employee Stock Option Plans (ESOPs)

ESOPs in a way address the agency problems	ESOPs tend to align the different interests by converging the goals of the management with the shareholders
It is used as a customized tool	ESOPs are an effective tool to attract and retain identified employees in an organization
History of ESOP	i. **Employee stock option scheme concept was first developed in the 1950's by lawyer and investment banker Louis Kelso**; who argued stronger capital system if all workers could have a share in owning capital producing assets. ii. **Section 2(15A) of Companies Act, 1956**, employee stock option given to whole time directors, officers or employees of a company, gives them the right to subscribe at a future date at a predetermined price. iii. **ABP opinion 25**: issued in **1975**, not recognized as compensation expense as there was **no reliable method** for calculating the value of employee stock options at the time.

Growth and History of ESOPs …Contd.

History of ESOP	iii. **SEBI** Employee Stock Option Scheme & Employee Stock Purchase Scheme Guidelines, **1999** (further amended in 2004, 2008 & 2009) iv. **FAS 123: issued in 1995** encouraged all companies to use the fair value accounting, but continued to permit the use of the intrinsic value based method (no expense recognition) v. **IFRS 2: issued in 2004**, FV based accounting vi. **FAS 123 R**: (After the Enron scandal, effective from **2005**) now permits only fair value accounting
Comparison of Indian Accounting Standards with IFRS	IFRS 2 which deals with ESOPs mandates that the fair value However in India, ICAI Guidance Note 18 is presently the force behind ESOP accounting – it permits 'Intrinsic Value' accounting with disclosure of 'Fair Value' impact
Model Choice for Fair Value Calculation	Fair value is derived from Option-Pricing Models. **IFRS 2 does not specify one option-pricing model to calculate fair value.**

Practices in ESOPs

Equity Settled	It is common for employers to issue equity-settled options. That is, an employee gets the right but not an obligation to buy her entitlement.
Cash Settled	Employers also can offer cash-settled ESOPs. That is, the employee is compensated in cash for the difference between the market price of the share on the exercise date and the strike price.

- Both variants of ESOP are akin to call options
- The vesting of shares under an ESOP series can be staggered over a deferral period or could be immediate

Accounting Standards Guidance - India

The Institute of Chartered Accountants of India has issued its Guidance Note # 18 in 2005, which describes the accounting treatment for ESOPs.

Equity Settled Options	The difference between the market price and the strike price on the date of issue is considered as cost and needs to be accounted on the 'grant date' over the vesting period of the ESOP. This difference is called as 'Intrinsic Value. **Estimation need at first instance only.**
Cash Settled Options	As the market price would change on each Balance Sheet date, the cost on an 'Intrinsic Value' basis needs to be estimated at every Balance Sheet date and amortized. That is, **an annual estimation of costs is needed.**
Suppliers Included	Accounting for share-based option costs is not restricted to options granted to employees. If a company grants share-based options to suppliers, the guidance kicks in.
Disclosure in 'Notes to the Accounts'	The guidance however requires companies to disclose the fair value of the ESOP (i.e. Intrinsic Value plus Time Value) and quantify the effect of accounting at fair value in the financial statements

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ESOP accounting practices of Indian companies

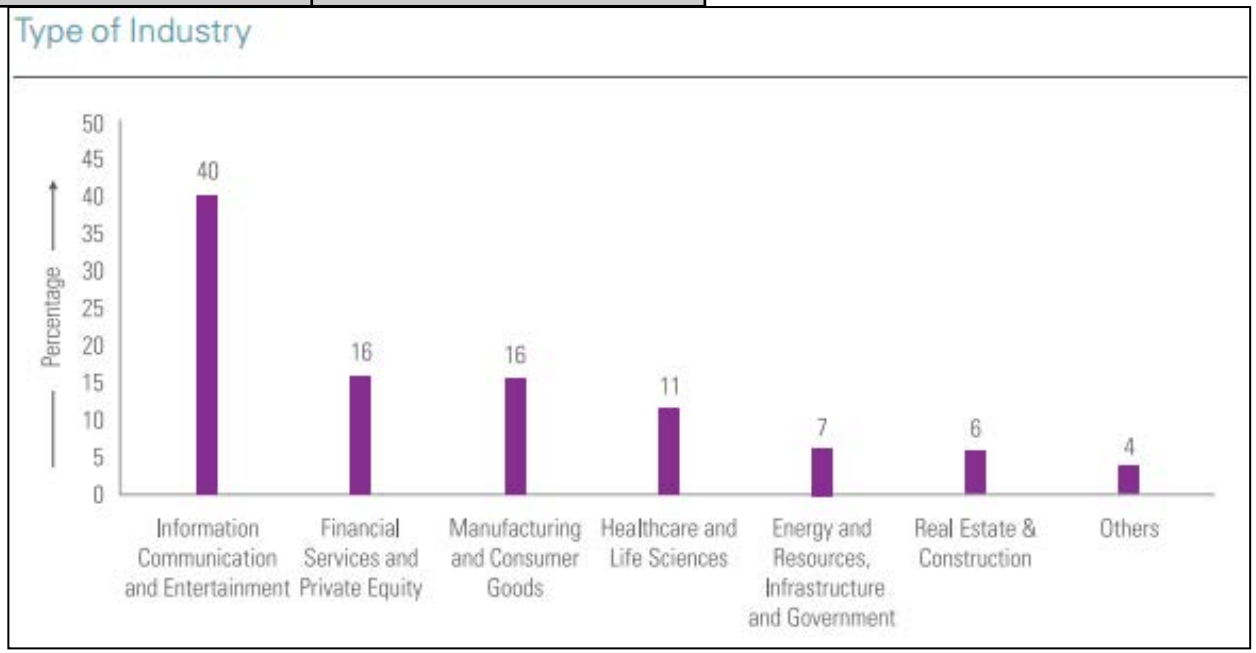
Sr. No.	Name of company	Market Cap (Rs Cr)	ESOP Granted YES/NO	EPS		Accounting Intrinsic value /FV	Impact on EPS due to FV
				Without ESOP	With ESOP		
1	**TCS**	497,340	NO	97.67	-	-	-
2	**Reliance**	331,120	YES (ESOS)	76.55	68..05	Couldn't find in AR	Couldn't find in AR
3	**ITC**	282,681	YES	Basic: 11.22 Diluted: 11.09	Basic: 11.09 Diluted: 10.96	Intrinsic Value	Basic: 11.09 Diluted: 10.96
4	**Infosys**	207,388	Not ESOP	basic: 178.4 Diluted: 178.4	Basic: 178.4 Diluted: 178.4	measured in FV	
5	**HDFC Bank**	207,132	YES (ESOS)	Basic-36.58 diluted-36.31	Basic: 35.47 Diluted: 35.21	Intrinsic Value	Basic: 33.12 Diluted: 32.9
6	**ICICI Bank**	184,042	YES (ESOS)	Basic: 95.65 Diluted: 95.14	Basic: 84.99 Diluted: 84.65	Intrinsic Value	Basic: 82.95 Diluted: 82.62
7	**Sun Pharma**	178,767	NO	Basic: 35 Diluted: 35	-	-	-

Trend in Indian companies

1. Industry participation:

Out of the 350 companies participated in the Survey, 203 companies had either implemented an ESOP or were planning to introduce a new. Out of which:

ICE sector	40% (82)
Financial Services & private equity	16% (32)
Manufacturing and Consumer Goods sector	16% (32)
Health care & life sciences	11% (22)

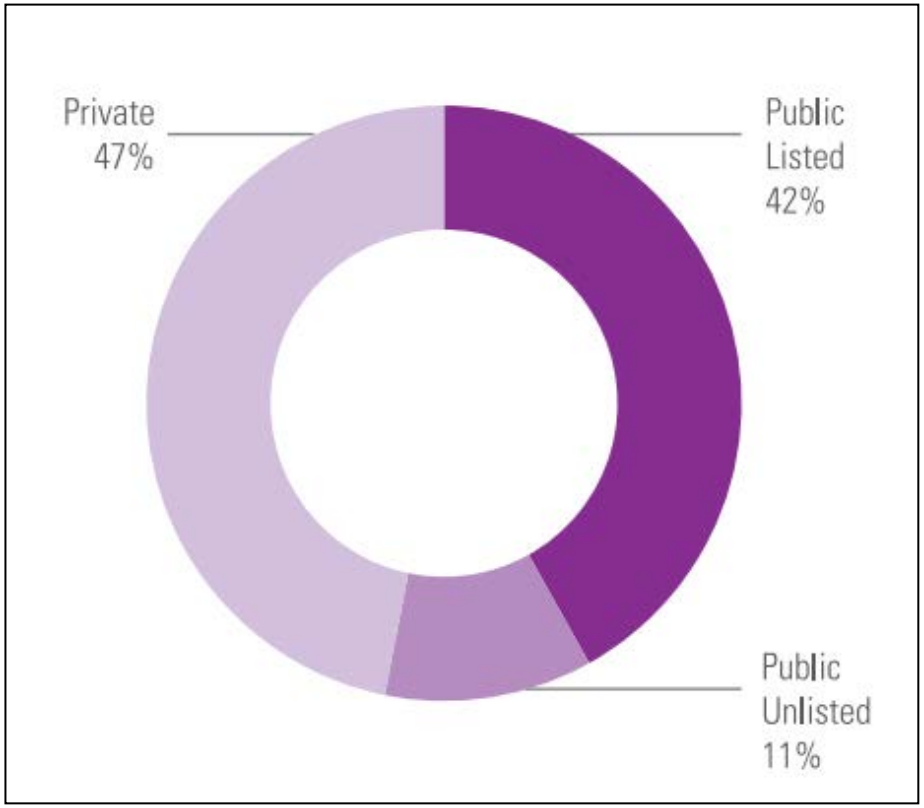


Source: KPMG's ESOP Survey, 2011

Trend in Indian companies…Contd.

2. Company participation

Public listed companies	42% (85)
Unlisted companies	58% (118)



Source: KPMG's ESOP Survey, 2011

Regulatory guidance: Securities law, Income tax, Foreign Exchange

SEBI Guidelines, 1999

SEBI guidelines are applicable to :

1. **Permanent employees of the Company working in India or out of India**
2. **Directors of the Company, excluding Promoters and independent directors; or**
3. **Permanent employee of a subsidiary, in India or out of India, or of a holding company of the company.**

Income Tax Act, 1961

Any issuance/transfer of shares to the employees of branch office or wholly owned subsidiary / holding company outside India, at a rate less than the value of the company / market rate as on the date of exercise, will be taxed as income in the hands of the employees

For Foreign Employees who **frequently visit India**, any income arises shall be taxed proportionately, i.e. according to the provisions of the **Income Tax Act, 1961**

Other Foreign Employees who have **never visited India** but holding shares of Indian Company, taxation aspect is as prescribed under the **DOUBLE TAXATION AVOIDANCE AGREEMENT** between India and the respective country in which the said foreign employee resides

FEMA Act, 1999

1. This Act is attracted for transfer of shares and fresh allotment to non-residents (foreigners).
2. Stock Options can be issued to Foreign Employees provided that the face value of shares to be allotted under the scheme to the non-resident employees does not exceed 5% of the paid-up capital of the issuing company.

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Definition of an 'Option

A Call (Put) Option	It is a right, but not an obligation, to buy (sell) an underlying security at a particular time and at a predetermined Strike Price
European & American Option	The time could be at the **end** of the life of the option i.e. **European** or at any time during the life of the option i.e. American
Another definition of option	An option is a contract written from a replicating portfolio comprising Φ shares and Ψ cash.

- **ESOPs are European Call Options**
- **Options defer to the principle of 'no arbitrage.'**

Binomial Model

Binomial model assumptions	1. No trading costs or taxes 2. No minimum or maximum units of trading 3. Stock and bonds can only be bought and sold at discrete times 1, 2, ... 4. The principle of no arbitrage applies
One period model	At time 1, we have two possibilities: $S_1 = \begin{cases} \mathbf{S_0 u} & \text{if stock price goes up} \\ \mathbf{S_0 d} & \text{if stock price goes down} \end{cases}$ S_t represents the price of a non-dividend paying stock at discrete time intervals t {t= 0,1,2,…} 'u': size of the up-jump 'd': size of the down-jump **In order to avoid arbitrage we must have $d < e^r < u$** I.e. the Principle of No-Arbitrage. Pause to understand e^r!

Determination of Derivative price

Say at time 0 we hold Φ units of stock and Ψ units of cash.

Then at time 0the value of this portfolio:

$$V_o = \Phi S_o + \Psi$$

At time 1 the same portfolio has the value:

V_1 $C_u = \Phi S_o u + \Psi e^r$ if the stock price went up...(i)

$C_d = \Phi S_o d + \Psi e^r$ if the stock price went down…(ii)

Solving the equations (i) & (ii) simultaneously, we get:

$$\Phi = \frac{C_u - C_d}{S_0(u-d)}$$

$$\Psi = \frac{e^{-r}(c_d u - c_u d)}{(u-d)}$$

Determination of Derivative price … Contd.

Using results of Φ and Ψ in $V_o = \Phi S_o + \Psi$

To get the results of a two-state Binomial Model

$$V_0 = e^{-r}[c_u \frac{(e^r - d)}{(u-d)} + c_d \frac{(u-e^r)}{(u-d)}]$$

Indeed the value of the portfolio at time 0 i.e. V_0 is product of:

a) Present value i.e. $\mathbf{e^{-r}}$

b) Random variable of value if it went up and down i.e. $\mathbf{c_u}$ and $\mathbf{c_d}$; and

c) Respective probability of going up and down i.e. $\mathbf{(e^r-d)/(u-d)}$ and $\mathbf{(u-e^r)/(u-d)}$

or $V_0 = e^{-r} V_1$ and $V_1 = \Sigma$ (Random Value x Probability)

Note that Φ units of shares and Ψ cash is a replicating portfolio, i.e. whichever way the share moves, V_0 is the present value of V_1

Quick Recap

$C_u = \Phi S_o u + \Psi e^r$

$C_d = \Phi S_o d + \Psi e^r$

$$V_0 = e^{-r}[c_u \frac{(e^r - d)}{(u-d)} + c_d \frac{(u - e^r)}{(u-d)}]$$

- If a portfolio of Φ shares and Ψ cash is set up, as long as **$d < e^r < u$** an option can be valued using a one-step binomial model
- Provided it is possible to borrow at risk-free rate r and hold shares and cash even in fractions
- The probability of up-jump is **$(e^r-d)/(u-d)$**
- And down-jump is **$(u-e^r)/(u-d)$**
- The key is to know **'u'** and **'d'** the size of jumps

Q. If u is much higher than 1 and d much lower than 1, would an option be more valuable than otherwise? (Hint: Volatility)

Answer

Q: If u is much higher than 1 and d much lower than 1, would an option be more valuable than otherwise?

A: Yes, greater the size of upward or downward movement would make an option more valuable. Remember that the option gives the holder a right but not an obligation to buy or sell the underlying share

Finding the size of jumps

Much theory postulates that share prices move as per a stochastic process called Geometric Brownian Motion

In that case:

$$\frac{S_{t+\delta t}}{S_t} \approx Lognormal[(r-\sigma^2/2)(\delta t), \sigma^2 \delta t)]$$

$$E[\ln(\frac{S_{t+\delta t}}{S_t})] = r.\delta t$$

$$V[\ln(\frac{S_{t+\delta t}}{S_t})] = E[\ln(\frac{S_{t+\delta t}}{S_t})^2] - \{E[\ln(\frac{S_{t+\delta t}}{S_t})]\}^2$$

The second term in the variance equation is of the order δt^2 and hence becomes 0

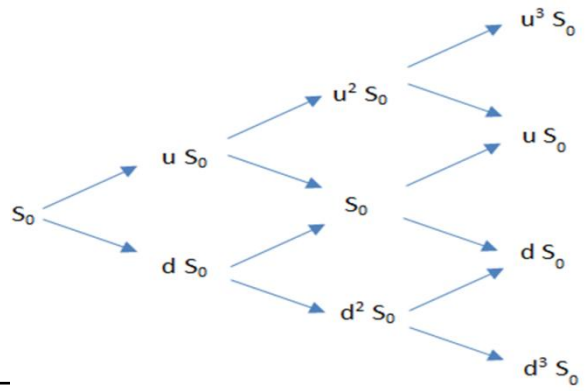
The first term of the variance equation becomes $(\ln u)^2$

But, we already know that Variance is $\sigma^2.\delta t$

Setting $(\ln u)^2 = \sigma^2.\delta t$, we get

$$u = \exp(\sigma.\sqrt{\delta t})$$

Summary of the Binomial Option Pricing Model

Mathematically simple, but surprisingly powerful method to price options	
Volatility σ	**If the volatility σ is known, the size of up and down jumps can be estimated**
Time δt	The short time δt can be set up to have multiple nodes in the binomial tree
Size of up and down jumps	Due to the uniform size of up and down jumps at different times, the binomial tree is a recombining one 
Valuing European call or put options	Discounting the payouts at the final nodes helps us to value the European Call or Put option.

Black –Scholes Formula Variables

The Black-Scholes-Merton formula is an example of a 'closed-form model' i.e. it uses an equation to produce an estimated fair value. Formula derived from solving $c_t = e^{-r(T-t)} E_Q [\max (S_T - K, 0) \mid F_t]$

c_t = price of a call at time t

S_t = price of the underlying share at time t

Φ = the cumulative probability distribution function; standard normal

q = dividend yield

K = call option exercise price

r = the continuously compounded risk-free rate

σ = Annualized volatility of the returns on underlying share

$T - t$ = time to expiry (in years)

B-S Option Pricing Formula

EPV of call option: e^-r(T-t) E[max(S(T) - K), 0 given F(t)]

To derive the formula:

$$c_t = S_t \Phi(d_1) - K e^{-r}(T-t)\Phi(d_2)$$

Where

$$d_1 = \frac{Ln(\frac{S_t}{K}) + (r + \frac{\sigma^2}{2})(T-t)}{\sigma\sqrt{T-t}}$$

and

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

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Relative 'In the Money' of call – intrinsic value

B-S Option Pricing Formula

EPV of call option: e^-r(T-t) E[max(S(T) - K), 0 given F(t)]

To derive the formula:

$$c_t = S_t \Phi(d_1) - K e^{-r}(T-t)\Phi(d_2)$$

Where

$$d_1 = \frac{Ln(\frac{S_t}{K}) + (r + \frac{\sigma^2}{2})(T-t)}{\sigma\sqrt{T-t}}$$

and

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

Function of risk-free rate, volatility and time to expire – time value

Binomial/ Lattice and Black Scholes Formulae – A comparison

Black Scholes Model	Binomial/ Lattice Model
Black-Scholes-Merton formula uses static assumptions and is not the best method to estimate the fair value of ESOPs	A lattice model can explicitly use dynamic assumptions regarding the term structure of volatility, dividend yields, and interest rates.
Black-Scholes-Merton formula cannot handle the additional complexity of a market based performance condition (limiting)	The lattice model, that takes into account employee exercise patterns based on the dynamics of an entity's share price may result in a better estimate of fair value (flexible)

- Vesting restrictions are needed to be entered in the binomial model
- The early exercise assumptions associated with exercising the option if the price reaches a certain high point: For every point, we need to determine the possibility of early exercise in the binomial model
- The longer the term of the option and the higher the dividend yield, the larger the amount by which the binomial lattice model value may differ from the Black-Scholes-Merton value.

Binomial/ Lattice and Black Scholes Formulae – which model to choose

The following questions can help to determine which model is more suitable to use for your specific organization:

1. Can you determine with accuracy the price of your security, and the probability of its increasing or decreasing during the future term of the option?
2. Do you have the staff that fully understands how to properly set up a Lattice/Binomial model, and are you willing to allocate the time for them to do that?
3. Have you already been using the Lattice/Binomial model successfully in the past to price your employee options?
4. Do you know with relatively good certainty how the patterns of trading in your options will be changing for the term of the option contracts?

If the answer to the above question is "NO" then Black Scholes would be a better choice

Source: Lattice or Black-Scholes: that is the question..by- Ramy Taraboulsi, M.Sc., MBA, CFA (Optract)

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Assumption Setting

Expected term of the option	
Vesting period	The option's expected term must be at least as long as its vesting period. The length of time employees hold options after they vest may vary inversely with the length of the vesting period
Employee exercise and termination patterns	History of employee exercise and termination patterns for similar grants (adjusted for current expectations)
Price of the underlying shares	Experience may indicate that employees tend to exercise options when the share price reaches a specified level above the exercise price
Employee's level within the organization	Experience may indicate that higher level employees exercise options later than lower level employees
Expected volatility of the underlying share	On average, employees tend to exercise options on higher volatility stocks earlier

Assumption Setting…Contd.

Expected Volatility	
Implied volatility	**Implied volatility** from traded share options on the entity's shares, or other traded instruments of the entity that include option features (such as convertible debt), if any
Historical volatility	**Historical volatility** of the share price over the most recent period that is generally commensurate with the expected term of the option
Length of time an entity's shares have been publicly traded	A newly listed entity might have a high historical volatility, compared with similar entities that have been listed longer
Tendency of volatility to revert to its mean	The long-term average level and other factors indicating that expected future volatility might differ from volatility in the immediate past appropriate and regular intervals for price observations

Assumption Setting…Contd.

Expected Dividends	Based on current expectations about an entity's anticipated dividend policy. If an entity has never paid a dividend, but has announced that it will begin paying a dividend yielding 2% of the current share price, then it is likely that an expected dividend yield of 2% would be assumed in estimating the fair value of its options.
Risk free rate	The risk-free interest rate is the implied yield currently available on zero-coupon government issues denominated in the currency of the market in which the underlying shares primarily trade.

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Criticisms of the Models

1. Presupposes that Lognormal distribution applies to share price returns; not borne out in practice
   a) Black-Scholes model is based on the Geometric Brownian Motion theory of share price movements, which in turn lead to parameterization under the lognormal distribution
   b) The size of up- and down-jumps are derived from the lognormal distribution of underlying share price movement

2. Assumes a perfect market with no trading and transaction costs

3. Permits unlimited borrowing and lending at risk-free rate; in practice, credit rating determines the borrowing and lending rate/ practice

Criticism of the Models

- The Black-Scholes Model identifies stock price returns to the normal distribution family!

  Recall the Stochastic Differential Equation $dS_t = S_t (\mu\, dt + \sigma\, dZ_t)$

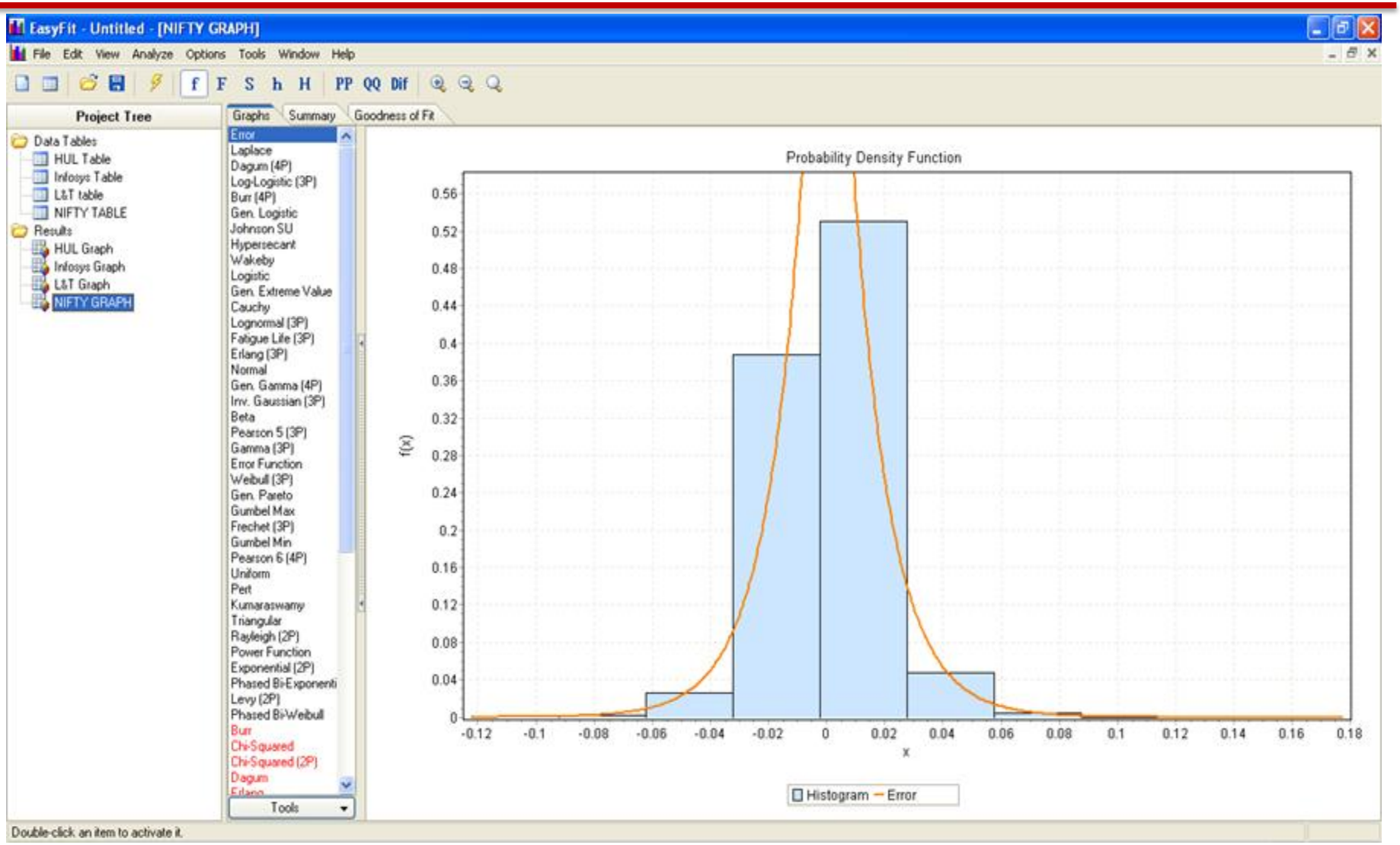
- Consider the extract below from Chapter 15 of Nassim Taleb's 'The Black Swan': The Bell Curve, That Great Intellectual Fraud

  Measures of uncertainty that are based on the bell curve simply disregard the probability, and the impact, of sharp jumps or discontinuities and are, therefore inapplicable in Extremistan

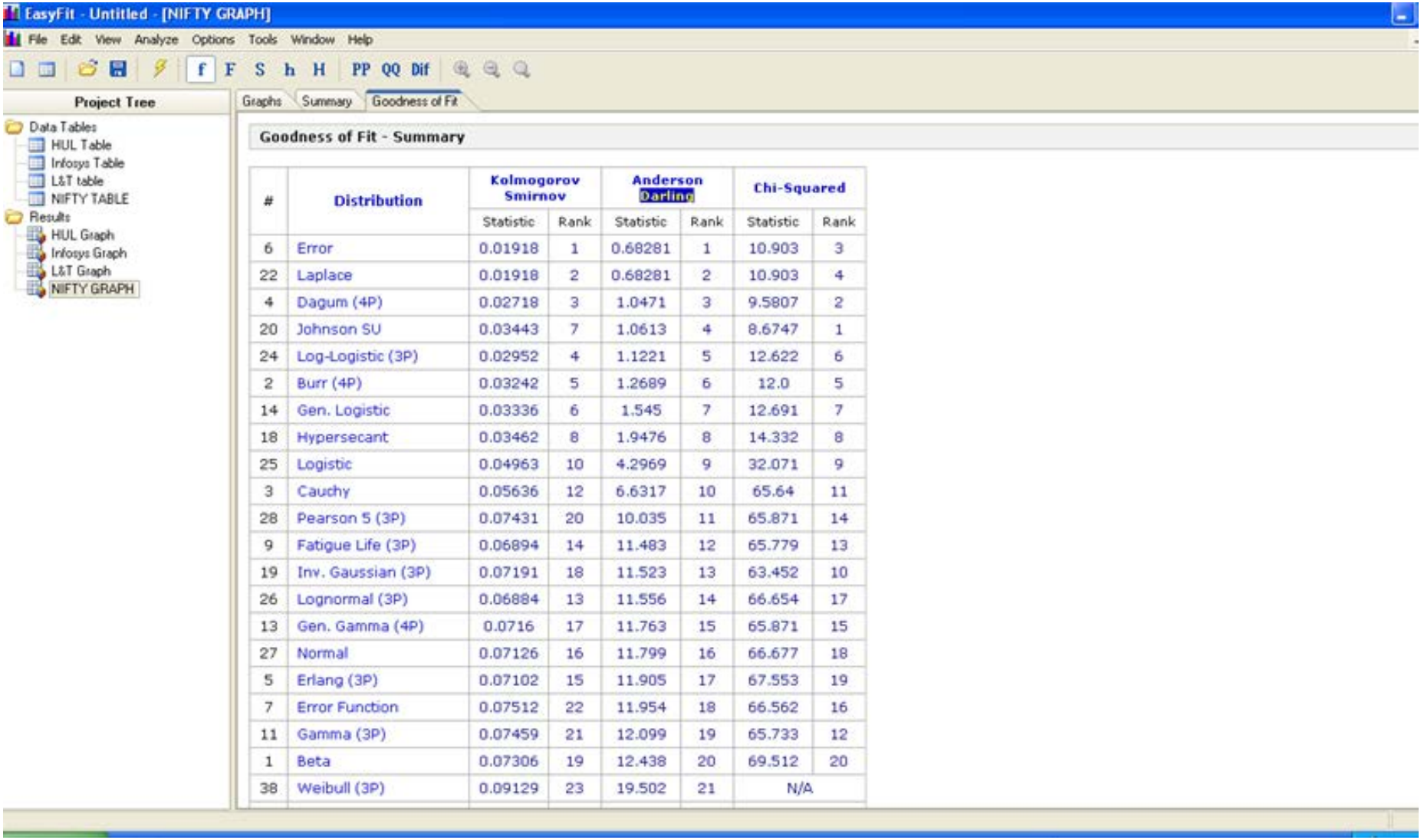
  Using them is like focusing on the grass and missing out on the (gigantic) trees.

- Indeed, share prices face extreme movements, both on the upside and the downside more frequently than the Normal/ Bell Curve models (Source: own view)

NIFTY Returns Distribution Fit (Sep 08 – Mar 12)



Nifty Returns (Sep 08 – Mar 12) Goodness of Fit



#	Distribution	Kolmogorov Smirnov		Anderson Darling		Chi-Squared	
		Statistic	Rank	Statistic	Rank	Statistic	Rank
6	Error	0.01918	1	0.68281	1	10.903	3
22	Laplace	0.01918	2	0.68281	2	10.903	4
4	Dagum (4P)	0.02718	3	1.0471	3	9.5807	2
20	Johnson SU	0.03443	7	1.0613	4	8.6747	1
24	Log-Logistic (3P)	0.02952	4	1.1221	5	12.622	6
2	Burr (4P)	0.03242	5	1.2689	6	12.0	5
14	Gen. Logistic	0.03336	6	1.545	7	12.691	7
18	Hypersecant	0.03462	8	1.9476	8	14.332	8
25	Logistic	0.04963	10	4.2969	9	32.071	9
3	Cauchy	0.05636	12	6.6317	10	65.64	11
28	Pearson 5 (3P)	0.07431	20	10.035	11	65.871	14
9	Fatigue Life (3P)	0.06894	14	11.483	12	65.779	13
19	Inv. Gaussian (3P)	0.07191	18	11.523	13	63.452	10
26	Lognormal (3P)	0.06884	13	11.556	14	66.654	17
13	Gen. Gamma (4P)	0.0716	17	11.763	15	65.871	15
27	Normal	0.07126	16	11.799	16	66.677	18
5	Erlang (3P)	0.07102	15	11.905	17	67.553	19
7	Error Function	0.07512	22	11.954	18	66.562	16
11	Gamma (3P)	0.07459	21	12.099	19	65.733	12
1	Beta	0.07306	19	12.438	20	69.512	20
38	Weibull (3P)	0.09129	23	19.502	21	N/A	

Criticism of the Black-Scholes Model … Contd.

Other limitations, though not as significant as the assumption of normal distribution.

1) The model assumes continuous trading so that replicating portfolios can be balanced continuously. Rather, this assumption is the guiding factor behind writing of derivatives.

2) Risk-free rate is assumed to be constant across maturities and unlimited borrowing/ lending is possible. In practice, availability of credit is greatly dependent on several factors including rating, liquidity and regulation.

3) Taxes and transaction costs are ignored

Limitations of the Black-Scholes Model with regard to ESOP

Attributes of employee share options that render the Black-Scholes-Merton formula less effective as a valuation technique for employee share options are:	
Long term to expiry	An assumption of constant volatility, interest rates and dividends over the life of ESOP with long contractual term would be inappropriate
Non-transferable	IFRS 2 provides for the use of an 'expected term' in place of the contractual life of ESOP – difficult to estimate!
Subject to vesting provisions	ESOPs often cannot be exercised prior to a specified vesting date. Vesting provisions therefore impact the valuation of share options because they affect the expected term of the options by, among other things, establishing a minimum expected term – difficult to model!

Limitations of the Black-Scholes Model with regard to ESOP…Contd.

Subject to term truncation	The term of an employee share option often is truncated upon termination of employment . Provisions regarding term truncation therefore will influence estimates of the expected term of the option.
Subject to blackout periods	Black out periods during which certain employees are not allowed to trade are not readily incorporated in the Black Scholes valuation.

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Disclosures in 'Notes to the Accounts'

d. Employee stock options details as on the Balance Sheet date are as follows:				
Particulars	During the YE 31 Mar, 20X2		During the YE 31 Mar, 20X1	
	Options (Nos.)	Weighted avg exercise price	Options (Nos.)	Weighted avg exercise price
1. Option outstanding at the beginning of the year:				
2. Granted during the year:				
3. Vested during the year:				
4. Exercised during the year:				
5. Lapsed during the year:				
6. Options outstanding at the end of the year:				
7. Options available for grant:				

Categorise as per ESOP types (A, B, Director) for all heads

e. The impact on Earnings per Share if the 'fair value' of the options (on the date of the grant) were considered instead of the 'intrinsic value' is as under:		
Particulars	During the YE 31 Mar, 20X2	During the YE 31 Mar, 20X1
1. Net Profit / (loss) (as reported)		
2. Add / (Less): stock based employee compensation (intrinsic value)		
3. Add / (Less): stock based compensation expenses as per FV method for the grants issued		
4. Net Profit / (loss) (proforma)		
1. Basic EPS (as reported)		
2. Basic EPS (proforma)		
3. Diluted EPS (as reported)		
4. Diluted EPS (proforma)		

Fair Value methodology is used to find the proforma values

Disclosures in Directors' report

The Directors' Report or Annexure must contain the following disclosure as per SEBI ESOP guidelines, 2009:

1. **The details of the number of shares issued in ESPS**: Options - granted, vested, exercised, lapsed, the total number of shares arising as a result of exercise of option, etc.
2. The **price at which such shares are issued**
3. **Employee-wise details of the shares issued** to:
   i. senior managerial personnel;
   ii. any employee who is issued shares in any one year amounting to 5% or more shares issued during that year;
   iii. Employees who were issued shares during any one year ≥ 1% of the issued capital of the company
4. **Diluted Earnings Per Share** (EPS) pursuant to issuance of shares under ESPS;
5. If the company has calculated the employee compensation cost using the intrinsic value of the stock options, the **difference between that and the employee compensation cost that shall have been recognized if it had used the fair value of the options**, shall be disclosed.
6. The **impact of this difference** on profits and on EPS of the company shall also be disclosed.
7. **Weighted-average** of exercise prices and fair values of options shall be disclosed separately for options whose exercise price either equals or exceeds or is less than the market price of the stock.
8. **A description of the method and significant assumptions** used during the year to estimate the fair values of options.
9. **Until all options granted in the three years prior to the IPO have been exercised or have lapsed must be disclosed.**

Disclosure requirements

How do actuaries develop reports to ease clients' disclosures in financial statements?

The following disclosures the actuary can provide which is a part of the director's report according to the SEBI guidelines.

1. Option Type
2. No. of equity shares represented by an option
3. No. of options granted
4. Fair Value per share
5. Exercise Price
6. Vesting Period
7. Expected Life of options
8. Weighted Average Contractual Life
9. Risk-free Interest Rate
10. Expected Dividend Yield
11. Volatility of Expected Returns
12. Fair Value per option tranche on grant date (corresponding vesting date shown in bracket)

Greater Challenges

1. Tricky practice areas

ESOP accounting for an unlisted company's share	
Expected life of the option	It will be challenging for unlisted companies to estimate the "expected" life of an option Companies can take guidance from the SEC's Staff Accounting Bulletin No. 107 of USA, FAS123R, GN 18
Fair value	For unlisted companies, an independent valuer may be appointed to determine the share value of the company as of options grant date.
Expected volatility of share price	unlisted companies can consider historical volatility in share prices of other listed comparable companies [GN 18: expected volatility can be taken as zero (para27)]

Greater Challenges…Contd.

2. Performance kicker	a. Deterministic model b. Stochastic model c. Valuing the EPV of the kicker
3. Cash settled options which need valuation at annual intervals	Areas in cash settled options: a. Effect of corporate actions e.g. bonus issue, share split, etc. b. Changes in assumptions between the valuation periods, including change in parameters like market value
4. Considering impact of the following points	a. Model choice; When to choose between B-S and Binomial b. Assumption setting esp. on sigma, time to exercise c. Impact of risk free rate, dividend, sigma, status (ITM/ OOTM) on time value d. additional vesting conditions e. Communication with clients esp. sigma choice, amortization, additional vesting conditions

Outline

1. Growth and History - US GAAP, IFRS, Indian GAAP
2. ESOP accounting practices of large Indian companies
3. Valuation Models
4. Choosing the Models
5. Assumption setting
6. Criticisms of the Models
7. Disclosure requirements
8. Greater Challenges
9. **Conclusion**

Conclusion

1. Appreciate the popular models, the underlying stochastic calculus, criticisms, choice of one over the other, etc

2. Understand regulatory guidance: ICAI GN 18, IFRS 2, SEBI ESOP & ESPS guidelines

3. Assumption setting on volatility, time to expiry, dividend yield performance kicker needs an informed judgment

4. Periodicity of valuation affected by type of scheme i.e. equity-settled and cash-settled

5. Presently not fair valued under Indian GAAP, so only intrinsic value enter P&L while fair value is captured in notes to the accounts

6. Draft ESOP reports to aid statutory disclosures

Questions?