Ind AS 102- Share Based Payments

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Valuation Framework for an Employee Benefits' Actuary



Today's Discussion



Entity Applicability



FY 2016-17 Listed and unlisted companies both with net worth above Rs 500 crores

FY 2017-18

All listed companies and unlisted companies with net worth above Rs 250 crores

First-time Adoption - Ind AS 101



Structure of Ind AS 102



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Overview of Ind AS 102



at settlement for Cash settled

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Ind AS 102's Scope

All share-based payment transactions <u>even if entity can[®]t identify</u> <u>specifically some or all services received</u>, including

- Equity settled share-based payment transactions
- Cash settled share-based payment transactions
- As per terms of arrangement of receiving goods or services, the entity or supplier can settle transaction in cash or equity shares

Ind AS 102's Scope .. Contd.

Ind AS 102 covers share-based payment arrangements, not merely share-based payment transactions

A share-based payment arrangement is "an agreement between the entity (or another group entity as defined in Ind AS 110 or any shareholder of any group entity) and another party (includes an employee) that entitles the other party to receive"

Ind AS 102 thus applies to share-based payment transaction <u>settled by another group entity</u>

A Classification exercise

Choose from:

I. Share options

- 2. Share appreciation rights
- 3. Share based payments with cash alternatives to the Counterparty
- 4. Restricted shares

A. Employees
can choose to
receive 100
shares after 3
years

B. Employees receive the difference between current market price and price prevailing at the end of 3 years of 100 shares

C. Employees receive 100 shares after 3 years, however shares have a lock-in of 2 more years

D. Employees can elect to receive 100 shares after 3 years, or its cash equivalent

A Classification exercise

Choose from:				
I. Share options				
2. Share appreciation rights				
3. Share based pay	yments with altern	atives to the Cou	nterparty	
4. Restricted shar	es			
A. Employees can choose to receive 100 shares after 3 years	B. Employees receive the difference between current market price and price prevailing at the end of 3 years of 100	C. Employees receive 100 shares after 3 years, however shares have a lock-in of 2 more years	D. Employees can elect to receive 100 shares after 3 years, or its cash equivalent	

Valuation exercise

SBPT	Valuation Requirement
Share options	Option Valuation at grant date only
SAR	Valuation at each balance sheet date and at settlement
SBPT with Alternative	Compound financial instrument – value equity and debt separately
Restricted Share	Fair Value of restricted shares i.e. after allowing for opportunity lost

Excluded from Scope of Ind AS 102

Right Issue	Transactions based on the holder's capacity as an equity owner (Para 4 of Ind AS 102)
Purchase Consideration	Instruments issued as consideration in a business combination or business contribution on Joint venture formation (Para 5 of Ind AS 102)
Other Accounting Standards	Awards in which the goods or services are within the scope of Ind AS 32, Financial Instruments: Presentation or Ind AS 109, Financial Instruments (Para 6 of Ind AS 102)
Benefit not linked to share price	Amount paid is not based on market price of entity's shares (definition of Share-based Payment Arrangement, Appendix A)

Today's Discussion



Grant Date

IGI, IG2 and IG3

The date at which:

- The entity and employee (or other party providing similar services) agree⁺ to
 - a share-based payment arrangement
- A shared understanding of the terms and conditions of the arrangement exists
- The entity confers on the counterparty the right to cash, other assets, or equity instruments of the entity, provided the specified vesting conditions, if any, are met
- Approval is obtained (if subject to an approval process)

SEBI: Grant date means the date on which the compensation committee approves the grant!

+Agree connotes both an offer and acceptance of the offer

Grant date Illustration



Purpose of Fair Value Calculation



Conditions (Vesting and Non-vesting)



Performance Condition

Does the condition upon which the exercise price, vesting, or exercisability of an equity instrument depends or <u>is related to the market price of the entity's equity instruments</u>, such as

- a) attaining a specified share price or
- b) specified amount of intrinsic value of a share option, or
- c) achieving a specified target that is based on the market price of the entity's equity instruments related to an index of market prices of equity instruments of other entities?



Relation between Service Condition and

Performance Condition



Allowing for conditions (Equity settled)



Possible scenarios for performance condition and

vesting period



Today's Discussion



Definition of an Option

Right but not an obligation	A Call (Put) Option is a right, but not an obligation , to buy (sell) an underlying security at a particular time and at a predetermined Strike Price.
Timing	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

Fair Value Components



Intrinsic Value



Time Value



Option's value over time till expiry*



Binomial Model-Approach

Paths indicating underlying asset's price and the option value Using projected prices to calculate the value of an American/ European option

Determining an option value given two possible outcomes

Binomial model-Methodology (European Call option)



Determination of Derivative Price

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

Then at time 0 the value of this portfolio:

 $\mathbf{V}_{o} = \Phi \mathbf{S}_{o} + \Psi$

At time I the same portfolio has the value:

 $\mathbf{V}_{\mathbf{I}} \int \mathbf{C}_{\mathbf{u}} = \Phi \mathbf{S}_{\mathbf{o}} \mathbf{u} + \Psi \mathbf{e}^{\mathbf{r}} \text{ if the stock price went up...(i)}$ $\mathbf{C}_{\mathbf{d}} = \Phi \mathbf{S}_{\mathbf{o}} \mathbf{d} + \Psi \mathbf{e}^{\mathbf{r}} \text{ if the stock price went down...(ii)}$

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



Determination of Derivative Price

Using results of Φ and Ψ in $V_o = \Phi S_o + \Psi$ To get the results of a two-state Binomial Model $V_0 = e^{-r} \left[c_u \frac{(e^r - d)}{(u - d)} + c_d \frac{(u - e^r)}{(u - d)} \right]$

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

- a) Present value i.e. **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. (e^r-d)/ (u-d) and (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

Finding the size of jumps

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

In that case:

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

Summary of Binomial model

Effectiveness	Powerful method to price options.
Inputs	If the volatility σ is known, the size of up and down jumps can be estimated.
Branches	The short time δt can be set up to have multiple nodes in the binomial tree.
Recombining	Uniform jump size at different times renders the binomial tree to be a recombining one.
Discounting	Discounting the payouts at the final nodes helps us to value the European option.

European Call Option (Non-dividend paying stock)

$$c_{t} = S_{t} \Phi(d_{1}) - Ke^{-r(T-t)} \Phi(d_{2})$$

Where

$$d_{1} = \frac{Ln(\frac{S_{t}}{K}) + (r + \frac{\sigma^{2}}{2})(T - t)}{\sigma\sqrt{T - t}}$$

and

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

$$OR$$

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

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

K = call option exercise price

r = the continuously compounded riskfree rate

 σ = Annualized volatility of the returns on underlying share

T – t = time to expiration (in years)
Binomial/ Lattice and Black Scholes Formulae – A comparison

	Black Scholes Model	Binomial/ Lattice Model
Assumptions	Static assumptions over the expected term.	Possible to use dynamic assumptions for interest rates, dividend yields, and volatility.
Market based performance Condition	Unable to allow the complexity of a market based performance condition .	Possible to embed such a condition resulting in a better estimate of fair value.
Early Exercise and Vesting Period	Approximation by "Expected Term of option"	Explicitly modeled*
Black out Period	Periods during which trading is disallowed is not readily incorporated	Can be allowed
American Options (i.e. can exercise prior to expiration)	Not suitable	Can value American options

*Image from Investopedia

- 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

Today's Discussion



Whilst Ind AS 102 on Share-based Payments does not obligate any particular method, the option-pricing model used must take into account a minimum of six inputs.

These are:

- 1. Current price of the underlying share
- 2. Exercise price
- 3. Expected volatility of the price of the underlying share
- 4. Expected dividends on the underlying share
- 5. Risk-free interest rate for the expected term
- 6. Expected term of the option, taking into account both the contractual term of the option and the expected effects of employees' exercise and post-vesting behavior

Sensitivity of Option Value-Expected

life



Sensitivity of Option Value-Volatility



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Sensitivity of option value-Risk free rate



Market Price - Rs100 Exercise Price - Rs 75 Volatility- 25% p.a. Expected Life- 5 years

Sensitivity of option value-Current Share

Price



Exercise Price - Rs 75 Volatility- 25% p.a. Risk Free rate- 5% p.a. Expected Life- 5 years

Directional Impact of the change in

assumptions

An increase in the	Results in a fair value estimate of a Call Option
Current price of the underlying share	Higher
Exercise price of the option	Lower
Expected volatility of the stock	Higher
Expected dividends on the stock	Lower
Risk-free interest rate	Higher
Expected term of the option	Higher

It is important to understand all the terms and conditions of a share-based payment arrangement because this enables the issuer to choose the most appropriate option pricing model.

Assumptions" Setting

Expected term of the option			
Vesting period	Average holding-time post vesting may vary inversely with vesting period		
History of employee exercise and termination patterns	Similar grants (adjusted for current expectations)		
Price of the underlying shares	Historical Exercise behaviour related to Price levels?		
Employee's level within the organization	Historical experience of rank-exercise		
Expected volatility of the underlying share	Usually, higher volatility results in faster exercise		
SEBI: Expected Life exercise period (units)	e should not be less than half the nless supported by historical evidence).		

Segregation into groups with homogenous exercise behaviour critical!

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Assumptions" Setting ... Contd.

Expected volatility	
Implied volatility	Traded share options on the entity's shares or convertible debt
Historical volatility	Share price volatility over a term commensurate with the expected term of the option
Newly listed entity	High historical volatility, compared with similar entities that have been listed longer
Mean reverting	Tendency to revert to the long term average
Appropriate and regular intervals for price observations	Consistent observations of share price

Expected Dividends	Whether dividends are expected ?
	Historical pattern?
	Mean dividend yield of comparable peers?
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 with a term equal to the term

Today's Discussion



Measurement of Equity-settled SBPT to Employees

In practice, it is not possible to measure fair value of services rendered by employees (and others providing similar services)

Paragraphs II & I2 of Ind AS 102:

- I. Measure at fair value of equity instruments granted
- 2. Fair value measured at grant date
- 3. Credit recognized in equity

Recognition Principles: Equity-settled and Cash-settled SBPT

	At each reporting date	
Recognition Methodology	Recalculation of Fair Value	Recalculation of number expected to vest
Equity settled	Not permitted*	Required
Cash settled	Required	Required

* Unless original instrument modified

Only the grant date fair value is used to recognise cost for Equity-settled SBPT

Example: Equity-settled ESOP



Options expected to vest

Total expected cost to be

as on 20 Feb 2020

Total Grant: 1,000 ESOPs each to its 100 employees on 20 February 2017

Market Price per share = Rs 100

Strike Price per option = 75

Service Condition: Applicable

Vesting Period: 3 years

Expected Withdrawal rate = 10%

Face Value per share = Rs 10

Fair Value per option on grant date = 38

All Amounts in Rs

recognized

72,900 i.e.

1000*100*(0.9)^3

Rs. 2,770,200

(72,900 * 38)

Example (Contd.)

Expense Recognition



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Example (Contd..) Expense Recognition

Date	Particulars	Debit (Rs.)	Credit (Rs.)
21 March 2017	P&L	92,340	
ST March 2017	ESOP outstanding		92,340
21 Marsh 2010	P&L	923,400	
31 March 2018	ESOP outstanding		923,400
21 March 2010	P&L	923,400	
31 March 2019	ESOP outstanding		923,400
20 February	P&L	831,060	831.060
2020	ESOP outstanding		001,000

Example (Contd..) Settlement Recognition

Date	Particulars	Debit (Rs.)	Credit (Rs.)
20 Eeb 2020	Bank account (72,900 * 75) ESOP outstanding account	5,467,500 2,770,200	
(If exercised)	Equity Share capital account (72,900 * 10) Share Premium account (Balancing Item)		729,000 7,508,700
20 Feb 2020 (If lapsed)	ESOP outstanding account General reserve account	2,770,200	2,770,200

SBPT with cash alternative to Entity

Entity has to determine if the present obligation is to settle in cash or equity

Cash	 If settlement choice in equity has no commercial substance (unlisted) If entity usually settles in cash when counterparty insists Account as per cash-settled SBPT
	 For listed company, the settlement choice in equity has
Equity	 commercial substance Account as per equity-settled SBPT
On	 If recognition as Equity settled but settlement in cash, cash settlement amounts to equity repurchase
settlement	If recognition as Cash settled, but settlement in Equity , transfer of Liability to Equity
	 Any excess through P&L

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SBPT with cash alternative to Counterparty

Debt Component	 Recognise a liability for goods and services received Account as per cash-settled SBPT
Equity Component	 Recognise an increase in Equity for goods and services received Account as per equity-settled SBPT
On settlement	 Remeasure the liability at FV If counterparty chooses cash, liability is extinguished If counterparty chooses equity, liability transferred to Equity Any equity component previously recognised will remain in Equity

For Employees, often the FV of one settlement alternative is the same as other e.g. choice between ESOPs and SAR

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Today's Discussion



Group entities-Key Paras- Para 43(B)





*Roman numerals of Para 43 (B) are not a part of the standard; these are for presentation purposes only Page 58 © 2018 Ankolekar & Co. All rights reserved.

Group entities-Key Paras- Para 43(C)

Group entity settling the SBPT of another (Para 43C) The entity settling a transaction shall recognise the transaction as an Equitysettled SBPT only if it is settled in the entity's own equity instruments. Otherwise recognised as cash-settled SBPT.



SBPT among Group entities- Four issues

Commonly encountered issues addressed by the Standard are the ones involving...



"Entity" and "Subsidiary" are used interchangeably "Shareholder" and "Parent" are used interchangeably

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SBPT among Group entities- Entity's Equity Instrument

Scenario I:Equity settled or Cash settled for the Entity (Subsidiary) and Shareholder (Parent)? Hint: Refer Para 43 B



Entity's fin statement	Equity settled	43 (B) (ii) fulfilled
Parent's fin statement	Not Applicable	Parent not involved. 43(C) not invoked

SBPT among Group entities- Entity's Equity Instrument

Scenario 2: Equity settled or Cash settled for the Entity and Parent? Hint: Para 43 B for Subsidiary and Para 43 C for Parent Conditions Scenario I Scenario 2 **Parent** provides Who is to satisfy the equity NA instruments the obligation? needed **Entity or Parent** Whose equity grants rights to instruments will NA equity instruments of be granted? the entity

Entity's fin statement	Equity settled	43 (B) (ii) fulfilled
Shareholder's (Parent) fin statement:	Cash settled	As per 43 (C).

SBPT among Group entities- Parent's Equity Instrument

Scenario I: Equity settled or Cash settled for the Subsidiary and Parent? Hint: Refer Para 43 B for Subsidiary and Para 43C for Parent



SBPT among Group entities- Parent's Equity Instrument

Scenario 2: Equity settled or Cash settled for the Subsidiary and Parent? Hint: Refer Para 43 B for Subsidiary and Para 43C for Parent



SBPT among Group entities- Cash settled SBPT



SBPT among Group entities- Cash settled SBPT



Accounting Entries in the following slide

SBPT among Group entities- Cash settled SBPT (Accounting Entries)

Entity (Equity settled)	Parent (Cash settled)
Over vesting	Over vesting
P&L Dr To Contribution from Parent	Contribution to Subsidiary* Dr To Liability
At settlement	At settlement
No entry	Liability Dr To Bank

*IFRS 2 is silent on the treatment of the debit entry arising from recognition and remeasurement of the obligation in the parent's separate financial statements

SBPT among Group entities- Employee

transfers across group entities

Parent Company grants rights to own equity instruments to subsidiaries' employees Hint: Refer Para 43 B for Subsidiary and Para 43C for Parent

Scenario I: In subsidiary books, if Parent Company to settle the obligation in Parent's equity instruments

Considers the proportion of vesting period served with each subsidiary

Subsidiary's fin statement:	Equity settled	43 (B) (i) fulfilled
Parent fin statement:	Not explicit in the Standard	As per 43 (C), could be equity-settled
SBPT among Group entities- Employee transfers across group entities

rent Company § nt: Refer Para 43	grants rights to own equity ir B for Subsidiary and Para 430	istruments to subsidiaries' emplo C for Parent		
Sce	nario 2: In subsidiary books, if Subsidiary to settle the obligation in Parent [®] s equity instruments			
	Considers the proportion of vesting period served with each subsidiary			
Subsidiary's fin statement:	Cash settled	43 (B) (i) & (ii) NOT fulfilled		
Parent fin statement:	Not mentioned in the Standard	Since Parent does not have the obligation.		

Forfeiture and Lapses of Equity-Settled Instruments



Today's Discussion



Modification to grant terms and conditions

Incremental FV recognised over the remaining vesting period (measured at date of modification)

Ignore if FV decrease.

If reduction in number of equity instruments, treat as cancellation*

Acceleration of vesting Repurchase of Equity Any excess in P&L

Remeasure at each reporting date anyway

FV of equity instruments granted (to the extent of goods and services received) Liability derecognised on Modification date Difference in P&L

Incremental FV is the difference between the FV of the modified equity instrument and that of the original equity instrument, both estimated as at the date of the modification.

*SEBI guidelines do not permit modification that is detrimental to employees.

Equity-Settled (Fair Value Change)

Equity-Settled (Cancellation or Settlement)

Cash-Settled (FV change)

Cash settled (Modified to Equity-settled **OR** Cancellation/Settlement where replacement Equity instruments are granted



Modifications - Repricing/replacement for Equity settled SBPT



Modifications - Repricing/replacement for Equity settled SBPT



Modifications – Settlement/cancellation for Equity settled SBPT



Modification Example (Exercising Professional Judgment)

Original ESOP plan feature	Expected Exercise period considered :
	2 years for actively serving employees. (Lapse at resignation)
Modified ESOP plan feature	Exercise period of I year after resignation

Original ESOP[®]s Fair Value

Vesting Date	Fair value (Rs) per option
03-04-19	26.20
03-04-20	31.78
03-04-21	36.99
03-04-22	41.85

Modification Example (Exercising

Professional Judgment) Contd..

Considerations:

Whether this modification will affect the expected exercise period? Yes

If yes, will it lead to an increase in Fair Value? Yes

If yes, how should this be allowed for? **Recalculate the FV with a higher** expected exercise period.

Option I - Increase the expected exercise period by I year Option I I - Increase the exercise period by I year weighed by the resignation probability.

Modification Example (Exercising Professional Judgment) Contd..

Option 1:3 year expected exercise period for all			Option 2: possible re	Increase the esignations	e expected e>	cercise period t	
Vesting Date	Original	Option I	Difference	Vesting Date	Original	Option 2	Difference
03-04-19	26.20	31.78	5.58	03-04-19	26.20	26.74	0.54
03-04-20	31.78	36.99	5.21	03-04-20	31.78	32.23	0.45
03-04-21	36.99	41.85	4.86	03-04-21	36.99	37.37	0.38
03-04-22	41.85	46.38	4.53	03-04-22	41.85	42.17	0.32

Option 2 is appropriate because:-

- Not all employees resign after vesting
- Modification is relevant only for employees resigning
- The increase is negligible as expected compared to Option I because of low withdrawal rate

Indicative disclosures

Classification	Sample Content
Plan Description	Terms and conditions
ESOP Movement	Number and weighted average exercise prices in each series e.g. outstanding at the beginning of the period, granted during the period, etc
Exercised options	Weighted average share price at the exercise date
Outstanding at year end	Range of exercise prices and weighted average remaining contractual life.
ESOP	 The option pricing model and inputs used, Effects of expected early exercise incorporated, Expected volatility determination Features of option grant in FV measurement.

Indicative disclosures

Classification	Sample Content
Non-ESOP	 Number and weighted average fair value at the measurement date, Fair Value measurement
Modified SBPT	Explanation of modificationsIncremental FV granted
Direct measurement	FV of goods and services calculated directly
Expense for the period	Expense for Equity settled transaction
Liability related and Tax related cash flow	Carrying amount of liability at the end of the period

Q & A

