Option Pricing Model

The Option Pricing Model (OPM) is widely utilised in valuing securities within the capital structures of privately held companies, where active markets for such securities are often absent. Even though the name suggests that the model is meant for valuing option contracts, the model can be extended for the valuation of equity instruments as well.

The OPM serves as a method for allocating equity value across multiple security classes within a company's capital structure, rather than estimating the enterprise value as a whole. Before applying the OPM, an overall equity value must be estimated using the various approaches like asset, income, and market approaches, with any debt obligations subtracted from the enterprise value.

The OPM operates by treating each security class as a call option on the company's total equity value. The Black-Scholes model is often used to value these call options, considering parameters such as stock price, exercise price, time, volatility, and risk-free rate. Within the OPM framework, the company's total equity value represents the stock price, while the liquidation preference of the security serves as the exercise price. Notably, when the OPM utilises the Black-Scholes model, it becomes highly sensitive to estimates for time to liquidity and volatility during this period.

To apply OPM for valuation of equities, it shall be considered that:

- Equity represents a residual claim, meaning that equity holders are entitled to any remaining cashflows after satisfying other financial obligations such as debt and preferred stock.
- This principle holds true even in the event of liquidation, wherein equity investors receive whatever assets remain after settling all outstanding debts and financial claims.
- The concept of limited liability safeguards equity investors. If the firm's value falls short of its outstanding debt, investors are protected from losing more than their initial investment in the company.

A specific use case of OPM in valuing equities arises for venture capital and private equity-backed companies, who often utilise a mix of equity securities, each conferring distinct rights upon its holders. Due to the inherent risks involved, investors typically require different classes of equity with varying entitlements. In the capital structures of privately held companies, these equity classes include preferred shares, common shares, options, and other securities, all offering different sets of privileges.

In such cases, each such obligation is treated as a separate call option on the company, with exercise price being calculated as a function of enterprise value and liquidation preference of the security.

Use case of OPM in valuation of securities

Valuers often grapple with the challenge of allocating value to each security amidst this complexity. The suitability of the OPM depends on specific company characteristics, particularly favoring firms with longer liquidity event timelines and diverse exit options. It excels in valuing option-like payoffs, such as common stock options and warrants.

- **Equity in troubled firms:** Equity in distressed or troubled firms, usually characterized by high leverage, negative earnings, and a substantial risk of bankruptcy, can be conceptualized as a call option. In this scenario, equity holders have the option to participate in the liquidation of the firm, potentially realizing value if the firm's assets exceed its liabilities upon liquidation. The OPM provides a framework to assess the value of this optionality inherent in the equity of troubled firms, offering insights into the potential upside for equity holders despite the challenging financial circumstances.
- **Start-up and High-Growth Firms:** Start-up firms or high-growth companies often derive the bulk of their value from intangible assets such as patents, proprietary technologies, or innovative business models. In such cases, the OPM can be employed to assess the value of these rights as options. For example, a patent may grant its holder the exclusive right to commercialize a product or technology, akin to a call option on the future cash flows generated by the patented innovation. By utilizing the OPM, investors and analysts can quantify the value of these option-like assets, providing a more comprehensive understanding of the firm's intrinsic worth and growth prospects.
- **Real Options Analysis:** Beyond the traditional financial securities, OPM can be applied to assess real options embedded in strategic business decisions. For instance, evaluating the option to expand, delay, or abandon a capital project mirrors the principles of financial options. Real options analysis using OPM enables decision-makers to quantify the value of flexibility and adaptability in uncertain environments, enhancing strategic decision-making.
- **Mergers and Acquisitions (M&A):** In the context of mergers and acquisitions, OPM can be employed to value contingent consideration. Specifically for mergers that provide additional consideration to sellers based on the achievement of specific performance targets or milestones post-acquisition. OPM facilitates the valuation of these contingent payments by treating them as options.
- **Employee Stock Options (ESOPs):** OPM is widely used in the valuation of employee stock options granted as part of compensation packages. By treating ESOPs as call options on the company's stock, OPM helps companies and investors estimate the fair value of these options, ensuring compliance with accounting standards such as IFRS 2/Ind AS 102[1].
- **Convertible Securities:** Convertible securities, such as convertible bonds or convertible preferred stock, possess characteristics of both debt and equity instruments. OPM can be utilized to value the embedded conversion option in these securities, enabling investors to assess the trade-offs between debt and equity features. By quantifying the value of the conversion option.
- **Natural Resource Companies:** For natural resource companies, particularly those with undeveloped reserves, the OPM offers a means to evaluate the value of these reserves as options on the underlying natural resource. Undeveloped reserves represent potential future cash flows,

[1] Refer Para B4 of Ind AS 102

akin to call options whose value is contingent upon the price and quantity of the underlying resource.

- **Biotechnology and Pharmaceutical Companies**: In industries characterized by high research and development expenditures and uncertain product pipelines, such as biotechnology and pharmaceuticals, OPM can be applied to value drug development projects and intellectual property portfolios. By treating future cash flows from successful drug approvals or licensing agreements as call options,

Merits and Demerits of the OPM for valuation of equities

As all other methods of valuation OPM has its own share of merit and demerits, which are discussed in detail in this section

Merits of OPM

- **Flexibility in Complex Capital Structures:** The OPM provides a flexible framework for valuing equity in companies with intricate capital structures, particularly those involving various classes of securities and options.
- **Captures Optionality:** By treating each security as a call option on the total equity value of the company, the OPM effectively captures the optionality inherent in certain securities, such as stock options and warrants.
- **Accommodates Limited Market Data:** In the absence of active markets for privately issued securities, the OPM offers a method to assign value based on fundamental parameters rather than relying solely on market transactions.
- **Tailored for Longer Liquidity Timelines**: It is well-suited for companies with longer liquidity event timelines, as it accounts for the time value of options and potential future outcomes.
- **Reflects Realistic Risk Profiles:** By incorporating volatility and other risk parameters, the OPM provides a more nuanced reflection of the risk associated with equity investments in privately held companies.

Demerits of OPM

- **Sensitivity to Assumptions:** The OPM's valuation outputs can be highly sensitive to assumptions regarding parameters such as time to liquidity, volatility, and risk-free rate. Small changes in these inputs can lead to significant variations in the calculated values.
- **Complexity of Implementation:** Implementing the OPM requires a deep understanding of financial derivatives and option pricing models, which may pose challenges for valuation practitioners without specialized expertise.
- **Limited Applicability:** While suitable for companies with longer liquidity event timelines and option-like payoffs, the OPM may not be the most appropriate valuation method for all types of businesses, particularly those with simpler capital structures or shorter investment horizons.
- **Reliance on Black-Scholes Model:** The OPM often relies on the Black-Scholes option pricing model, which has its own limitations and assumptions. Critics argue that the Black-Scholes model

may not accurately capture the complexities of real-world market dynamics, particularly in the context of privately held companies.

- **Difficulty in Estimating Volatility:** Estimating volatility, a key input in option pricing models, can be challenging, especially for companies lacking historical data or operating in volatile industries. Uncertainty in volatility estimates can introduce additional uncertainty into the valuation results.

Understanding Black-Scholes model

Before delving into the step-by-step approach of the OPM, it is crucial to understand the Black-Scholes model, which serves as the backbone of the approach. The Black-Scholes model provides a theoretical framework for valuing European options, based on certain assumptions and mathematical principles.

The Black-Scholes model is a mathematical model for determining the fair value of options and other derivatives in financial markets. It was developed by Fischer Black and Myron Scholes, with contributions from Robert C. Merton, in the early 1970s. The model is based on the Black-Scholes equation, which is a parabolic partial differential equation describing the dynamics of a financial market containing derivative instruments based on the principles of normal distribution of probabilities.

The Black-Scholes model provides a useful framework for valuing options and derivatives, but it has its limitations. These include assumptions of constant volatility, continuous trading, and the inability to account for market frictions and transaction costs. Moreover, there are variations of the Black-Scholes model used by different market participants, which can lead to differences in option pricing.

The key assumptions of a Black-Scholes model are as follows:

1. European-style options: European options can only be exercised at expiration, whereas American options can be exercised at any time before expiration. This simplifies the analysis because the timing of exercise is known. American options are generally more complex to value because of the additional consideration of when to exercise them.

2. No dividends: Dividends can affect the value of options, particularly for stocks that pay regular dividends. The Black-Scholes model assumes that the underlying asset does not pay dividends during the life of the option. If dividends are expected, adjustments need to be made to the model to account for the present value of those dividends.

3. Efficient markets: The model assumes a frictionless market where there are no transaction costs, taxes, or restrictions on short selling. This assumption allows for the creation of a riskless portfolio, which forms the basis of the model's derivation. In real-world markets, these factors can influence option prices and trading strategies.

4. Continuous trading: The assumption of continuous trading implies that investors can buy and sell the underlying asset at any time. This assumption allows for the use of continuous-time

mathematics in the model's derivation, making the mathematics more tractable. In reality, trading may not be continuous, especially for assets such as stocks that trade on exchanges with specific trading hours.

5. Constant risk-free interest rate: The model assumes a constant and known risk-free interest rate. This rate is typically represented by the yield on government bonds with the same maturity as the option. The assumption of a constant interest rate simplifies the discounting process for future cash flows and allows for a closed-form solution to the option pricing formula.

6. Constant volatility: Volatility measures the degree of variation of asset prices over time. The Black-Scholes model assumes that volatility remains constant throughout the life of the option. While this assumption simplifies the model, it may not accurately reflect reality, as volatility can change due to various factors such as market events, news, and changes in investor sentiment.

7. Log-normal distribution of asset returns: The model assumes that the distribution of asset returns follows a log-normal distribution. This means that the natural logarithm of the returns is normally distributed. This assumption, combined with the assumption of constant volatility, allows for the derivation of the Black-Scholes formula, which provides a theoretical framework for pricing options.

These assumptions collectively form the foundation of the Black-Scholes model and enable the derivation of a formula for calculating option prices. However, it is important to recognise that these assumptions may not always hold true in real-world markets, and deviations from these assumptions can affect the accuracy of the model's predictions, and therefore, following are the limitations of this model:

While the Black-Scholes model revolutionized the pricing of financial derivatives and remains widely used, it does have several limitations:

1. Assumption of Constant Volatility: One of the most significant limitations is the assumption of constant volatility. In reality, volatility fluctuates over time, often in response to market events and changes in investor sentiment. Ignoring this variability can lead to inaccuracies in option pricing, particularly during periods of high volatility.

2. No consideration of dividends: The Black-Scholes model assumes that the underlying asset does not pay dividends. In practice, many stocks pay dividends, which can affect option prices. The model's failure to account for dividends can lead to discrepancies between theoretical prices and market prices, especially for options on dividend-paying stocks.

3. European-Style Options only: The model is applicable only to European-style options, which can only be exercised at expiration. American-style options, which can be exercised at any time before expiration, require a different approach for valuation.

4. Market frictions not considered: The model assumes frictionless markets with no transaction costs, taxes, or restrictions on short selling. In reality, these factors can significantly impact option prices and trading strategies, especially for large institutional investors.

5. Assumption of continuous trading: The assumption of continuous trading is unrealistic, as trading often occurs intermittently, especially for assets such as stocks that trade on exchanges with specific trading hours. This assumption can affect the accuracy of the model's predictions, particularly in illiquid markets.

6. Risk-free interest rate assumption: The model assumes a constant and known risk-free interest rate. However, interest rates can fluctuate over time, affecting the present value of future cash flows and, consequently, option prices.

7. Limited underlying asset types: The model is primarily designed for options on non-dividend-paying stocks. While it can be extended to other underlying assets, such as stock indices and currencies, its applicability may be limited in certain cases, such as options on commodities or interest rates.

8. Market jumps and fat tails: The Black-Scholes model assumes a log-normal distribution of asset returns, implying that extreme market movements are highly improbable. However, in reality, markets can experience sudden jumps and exhibit fat-tailed distributions, which the model fails to capture.

Owing to the limitation, each valuer may employ its own version of the model, often tailored to address real-life issues and the stochastic nature of the underlying securities. However, in the given case, the focus lies on enterprise value rather than the price moments of any underlying security. Therefore, price moments are not a determining factor. (The formula mentioned below in the illustrative example reflects this.)

Despite its limitations, the Black-Scholes model remains a fundamental tool in financial valuation, providing insights into option pricing and risk management. By understanding its components and assumptions, analysts can better interpret option prices and make informed decisions in financial markets. However, it is essential to complement the model with empirical data and market insights to account for real-world complexities and uncertainties.

Further, as we will discuss in the following section in detail, the Black-Scholes model itself is based on various input items, it is considering these factors that the value of option is arrived. The Black-scholes model calculates the value of option as function of these items. Hence, the following discussion we provide a brief of each input item for the Black-Scholes formula[2]:

$$c = S\,N(d_1) - Ke^{-rT}N(d_2)$$

[2] Inputs are considered for the formula used by us in the illustration, as discussed above the Black-Scholes formula has several variations each adapted by specific fund houses for their specific principles and trading patterns, as well as asset type.

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

$$d_2 = \frac{\ln\left(\frac{S}{K}\right) + \left(r - \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

Underlying Asset Price (S):

- The current market price of the underlying asset, typically denoted as 'S'.
- Examples of underlying assets include stocks, indices, currencies, commodities, etc.
- The Black-Scholes model assumes that the underlying asset follows a geometric Brownian motion, characterised by constant volatility.

Exercise Price (K):

- Also known as the strike price, 'K' represents the price at which the option holder can buy (in the case of a call option) or sell (in the case of a put option) the underlying asset.
- It is an essential determinant in option pricing, influencing the intrinsic value of the option.

Time to Expiration (T):

- 'T' signifies the time remaining until the option contract expires.
- The Black-Scholes model assumes European-style options, which can only be exercised at expiration.
- Time to expiration has a significant impact on the option's value, with longer time periods generally resulting in higher option premiums.

Risk-Free Interest Rate (r):

- The risk-free interest rate, denoted as 'r', represents the theoretical return on an investment with zero risk of financial loss.
- Typically, the rate of return on short-term government bonds, such as Treasury bills, serves as a proxy for the risk-free rate.
- The Black-Scholes model assumes continuous compounding of interest at the risk-free rate over the life of the option.

Volatility (σ):

- Volatility reflects the degree of fluctuation in the price of the underlying asset.
- It is a measure of market sentiment and uncertainty, influencing the probability of large price movements.
- Higher volatility results in higher option premiums, as there is a greater chance of the option ending 'in the money' before expiration

Detailed discussion on application of the method and its calculation in MS-Excel is discussed in the following section.

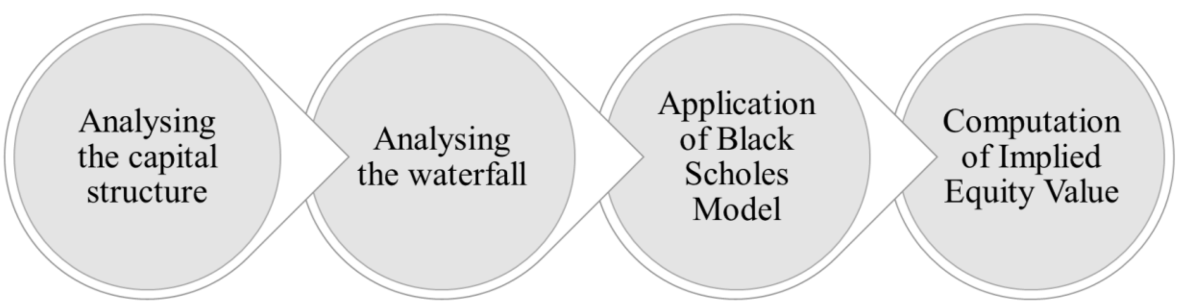
Step by Step approach for valuation

Having explored different facets and provided a concise overview of the methodology, let us now delve into the approach and steps required for valuing these securities. This method is also known as the Backsolve method, one must first estimate the company's value to establish threshold values in the waterfall analysis, considering various equity-related securities' rights. In the waterfall analysis, the detailed breakdown of payout levels in the event of an acquisition or liquidation is estimated. Essentially, it delineates how value is distributed among shareholders if the company is sold. The waterfall analysis serves as a valuable tool in financial modeling, providing insight into the distribution of proceeds among shareholders in various scenarios, including sale or exit events. The total payouts at different stages give us the breakpoints.

Then, utilising the Black-Scholes model, an option-based valuation equation is constructed, factoring in participation levels, volatility, and exit timelines. Transaction pricing data, preferably within a year and unaffected by subsequent company changes, is then utilised. Finally, the technique is applied to reconcile the equation with the most recent transaction price, thereby deriving values for all equity securities, including equity compensation units.

In practical application, the Backsolve method is instrumental in valuing companies with complex capital structures, unlike straightforward cases where a simple multiplication of total shares suffices. Through capital structure analysis and waterfall breakdown, followed by Black-Scholes option pricing and implied equity value determination, the Backsolve method offers a comprehensive approach to company valuation.

Therefore, the steps involved in arriving at the value of equity using OPM are as follows:



Step 1: Analysing the Capital Structure

As discussed above, OPM has a specific applicability in companies with complex capital structures with securities with different rights and interest. Accordingly, the very first step would be to analyse the capital structure of the target company. This would broadly entail two sub-steps:

- Examining the composition of the subject company's equity interests as of the valuation date, including preferred shares, restrictive shares, options, warrants, and other dilutive securities.
- Evaluate the rights associated with each class of equity, particularly preferred shares, which may have economic or control rights such as preferred dividends, redemption rights, conversion rights, and participation rights.

A sample capital structure for the reference may be as follows:

Exhibit 1: Capitalisation Table-Capital Structure year 1

Instrument	Shares Outstanding (Number)	Issue Price	Invested Capital	Liquidation Preference (x)	Conversion Price (of Equity)	Fully Diluted	Fully Diluted (%)	Liquidation Priority
Class A Preference Shares	10,00,000	₹ 1	₹ 10,00,000	1	₹ 2	₹ 5,00,000	19.61%	Pari Passu
Class B Preference Shares	15,00,000	₹ 1	₹ 15,00,000	1	₹ 5	₹ 3,00,000	11.76%	Pari Passu
Equity Shares	15,00,000		NA	2		₹ 15,00,000	58.82%	
Warrants					10	₹ 2,50,000	9.80%	
Total						₹ **25,50,000**	**100%**	

Here, for clarity, we have simplified the capital structure of the Company to include two classes of preference shares and common equity. Additionally, warrants have been issued that can convert into equity at a value of 10 each. Class A preference shares are convertible into equity at a price of 2 per share, while Class B preference shares can be converted at a price of 5 rupees per share.

It is important to note that in the event of liquidation, we assume that these preference shares and warrants will only convert if the enterprise value is sufficient to cover at least the conversion price or more. Otherwise, they will retain their original form.

The liquidation preference refers to the preference the respective instruments will get upon liquidation, if retained in the existing form. Since preference shares carry a liquidation preference, their preference has been kept at 1, and since equity represents the residual class, its preference has been kept at 2.

Computation of Enterprise Value

The method has specific application for valuing equity and related instruments, the method does not provide for valuation of the enterprise as whole. However, the enterprise value is required to arrive at a realisable value of equity, which is taken as exercise price for applying OPM.

Accordingly, the value of enterprise would be required to arrive at, using asset, income or market approaches.

The enterprise value so arrived would be then used to subtract financial obligations of the company to compute value of equity.

Payoff to equity on liquidation = $V - D$, if $V > D$
= 0, if $V \leq D$

Where,
- V = Value of the firm
- D = Face Value of the outstanding debt and other external claims

In this example we have assumed liquidation value to be Rs. 90,00,000/-

Step 2: Analysing the waterfalls and creating break-points:

Once enterprise value has been arrived at, the next step is to lay down the waterfall and determine and determine the breakpoints at which each class of equity transitions into "in-the-money" status, indicating the point where the equity value exceeds its associated exercise price.

In the present case, the following breakpoints are being assumed:

Breakpoint	Description
1	The preference shareholders get the payout based on the liquidation preference, and equity shareholders do not get paid anything
2	The value of equity increases to ₹ 2, and for Class A preference shares it becomes indifferent whether to convert the investments into equity or take a liquidation payout. Class B preference shares would still prefer to take a liquidation payout.

3	The value of equity increases to ₹ 5, and for Class A preference shares it makes sense to convert into equity shares, however, for Class B preference shares it is indifferent whether or not to convert as the payout remains the same in both the cases.
4	The value of equity increases ₹ 10, and for both Class A and B preference shares it makes sense to convert into equity shares. However, for the warrant holders, it becomes worthy of exercising them.

Exhibit 2 Definition of Breakpoints applying price per share				
Waterfall indicating additional payouts	**Breakpoint 1 [Both A and B take liquidation preference, price of equity is 0]**	**Breakpoint 2 [Price of equity is ₹ 2]**	**Breakpoint 3 [Price of equity is ₹ 5]**	**Breakpoint 4 [Price of equity is ₹ 10]**
Class A Preference shares	**₹ 10,00,000**	No additional payout, as it is indifferent for Class A.	**₹ 15,00,000** [No. of equity shares multiplied by the (value *minus* price under previous breakpoint)]	**₹ 25,00,000** [No. of equity shares multiplied by the (value *minus* price under previous breakpoint)]
Class B Preference shares	**₹ 15,00,000**	Class B will prefer liquidation value.	No additional payout, as it is indifferent for Class B.	**₹ 15,00,000** [No. of equity shares multiplied by the (value *minus* price under previous breakpoint)]
Common Shares	No payout	**₹ 30,00,000** [No. of equity shares multiplied by the (value *minus* price under previous breakpoint)]	**₹ 45,00,000** [No. of equity shares multiplied by the (value *minus* price under previous breakpoint)]	**₹ 75,00,000** [No. of equity shares multiplied by the (value *minus* price under previous breakpoint)]
Warrants	No payout	No payout	No payout	No payout
Total	₹ **25,00,000**	₹ **30,00,000**	₹ **60,00,000**	₹ **1,15,00,000**
Cumulative Value Equity Class, based on payouts after each breakpoint				

Class A Preferred	₹ 10,00,000	₹ 10,00,000	₹ 25,00,000	₹ 50,00,000
Class B Preferred	₹ 15,00,000	₹ 15,00,000	₹ 15,00,000	₹ 30,00,000
Common Shares	-	₹ 30,00,000	₹ 75,00,000	₹ 1,50,00,000
Warrants	-	-	-	-
Total	₹ **25,00,000**	₹ **55,00,000**	₹ **1,15,00,000**	₹ **2,30,00,000**

Step 3: Application of Black Scholes model

In this step, the Black-Scholes option pricing model is used to treat each class of securities as call options on the company's equity value, and compute the value of the option.

The formula used for the same would be:

$$c = S\,N(d_1) - Ke^{-rT}N(d_2)$$

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

$$d_2 = \frac{\ln\left(\frac{S}{K}\right) + \left(r - \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

Where:

S = the current price of the asset, here price of the Equity
K = the strike price, here a breakpoint
r = risk free rate
T = time to maturity
σ = standard deviation

Determining key inputs and assumptions in the present context:

Parameter	**Description**	**Value**

Stock Price	Total equity value derived from traditional valuation methods, adjusted for debt if applicable in step 1	₹ 90,00,000/-
Exercise Price	Equity value breakpoint determined in Step 2.	Breakpoint #1 - ₹ 25,00,000 Breakpoint #2 - ₹ 30,00,000 Breakpoint #3 - ₹ 60,00,000 Breakpoint #4 - ₹ 1,15,00,000
Time to Expiration (liquidation)	Estimate the timing of liquidity events based on management's projections.	5 years (assumption)
Volatility	Derived from observed volatilities of comparable companies, with adjustments for early-stage companies.	40% (assumption)
Risk-free Rate	Obtained from relevant government security returns corresponding to the time to liquidity.	4% (assumption)
Dividends	Rate of dividend expected on the security	0%

The abovementioned, formula may be adopted in the excel with following:

= Stock*EXP(-Dividend*Life) * NORMSDIST((LN(Stock/Exercise) + (Rate-Dividend+Volatility^2/2) *Life)/(Volatility*SQRT(Life))) - Exercise*EXP(-Rate*Life)*NORMSDIST(((LN(Stock/Exercise)+ (Rate-Dividend+Volatility^2/2)*Life)/(Volatility*SQRT(Life))-Volatility*SQRT(Life)))

The results for the same is as follows:

Exhibit 3: Application of OPM to derive value of different financial instruments						
	Total	No. 1	No.2	No.3	No.4	End
Lower Breakpoint [Value of last breakout point]		`	₹ 25,00,000	₹ 55,00,000	₹ 1,15,00,000	₹ 2,30,00,000

Upper Breakpoint [Value at which the option turns 'In-Money'[3]]		₹ 25,00,000	₹ 55,00,000	₹ 1,15,00,000	₹ 2,30,00,000	infinity
The current price of the Equity	₹ 90,00,000	₹ 90,00,000	₹ 90,00,000	₹ 90,00,000	₹ 90,00,000	
Exercise price/ Breakpoint		₹ 25,00,000	₹ 55,00,000	₹ 1,15,00,000	₹ 2,30,00,000	
Time to expiration (T)		5.0	5.0	5.0	5.0	
Volatility (V)		40%	40%	40%	40%	
Risk free rate		4.0%	4.0%	4.0%	4.0%	
Dividends		0.0%	0.0%	0.0%	0.0%	
Value of Call Option [Calculated using Black-Scholes formula discussed above]	₹ 90,00,000	₹ 70,25,715	₹ 51,72,697	₹ 29,75,307	₹ 12,61,026	
Incremental option value [Difference in value for previous breakout point to particular breakout point]		₹ 19,74,285	₹ 18,53,018	₹ 21,97,390	₹ 17,14,281	₹ 12,61,026
Breakpoint Participation percentages [Number of shares/Total Shares]						
Class A Preferred		40.0%	0.0%	25.0%	21.7%	19.6%
Class B Preferred		60.0%	0.0%	0.0%	13.0%	11.8%

[3] means that an option has value or its strike price is favorable compared to the prevailing market price of the underlying asset.

Common Shares		0.0%	100.0%	75.0%	65.2%	58.8%
Warrants		0.0%	0.0%	0.0%	0.0%	9.8%
Total		100%	100%	100%	100%	100%

Based on the inputs mentioned above, and considering the enterprise value at 90,00,000/- the call option value is calculated using Black-Scholes formula discussed above. For each scenario outstanding equity is taken at the number of shares calculated in the exhibit 2.

The difference in value from previous breakout is considered as incremental option value.

Step 4: Computation of implied equity value

Allocate the incremental option values to ownership interests, arriving at the per-share value of equity securities.

Exhibit 4: Allocation of incremental Option Value [Incremental option value * Breakpoint Participation percentages]							
	Total Value [Sum of value at each breakout point] (A)	Class A/B Liquidation Preference	Class A Converts	Class B Converts	Warrants executed	Class A/B Liquidation Preference	Value per share (based on equity at fully diluted basis) (A/ number of shares)
Class A Preference Shares	**₹19,58,991**	₹7,89,714	₹ -	₹ 5,49,347	₹ 3,72,670	₹ 2,47,260	₹ 3.92
Class B Preference Shares	**₹15,56,529**	₹11,84,571	₹ -	₹ -	₹ 2,23,602	₹ 1,48,356	₹ 5.19
Common Shares	**₹53,60,850**	₹ -	₹ 18,53,018	₹ 16,48,042	₹ 11,18,009	₹ 7,41,780	₹ 3.57
Warrants	**₹ 1,23,630**	₹ -	₹ -	₹ -	₹ -	₹ 1,23,630	₹ 0.49