

ALLOCATION OF VALUE TO MULTIPLE CLASSES OF EQUITY SHARES IN A COMPANY

August 2022



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This newsletter discusses practical application of the option pricing models in the allocation of value to multiple classes of equity shares in a company.

INTRODUCTION

Our previous newsletters discussed the various option pricing models such as the Black Scholes option pricing model and the Monte Carlo Simulation model.

Capital structures with multiples classes of equity are typically observed in start-ups and early-stage companies. This is because they are funded via multiple rounds and each round of investment involves a different set of investors with differential rights and preferences.

Multiple classes of equity include but are not limited to equity shares, convertible preference shares, employee stock options etc. It must be noted that for the purpose of an allocation of value exercise, debentures that are convertible in nature are also considered as equity.

WHY IS AN ALLOCATION EXERCISE NECESSARY?

Traditional valuation approaches are useful to arrive at the value of equity, after reducing the value of debt but in cases where there are several classes of equity that are issued (complex capital structure), the need for an allocation exercise arises in order to determine the fair value of a specific class of equity vis-à-vis the company as a whole. Complex capital structures include equity instruments that may be considered as potentially dilutive, for example, warrants. This potentially dilutive nature of the warrants may not be captured in a plain-vanilla valuation exercise.

Traditional valuation	Valuation involving complex securities
<ul style="list-style-type: none"> Used for companies with simple capital structures i.e. single class of equity Income, asset or market approach of valuation used to arrive at the value of the equity shares No such analysis required as only one class of share exists. 	<ul style="list-style-type: none"> Used for companies with complex capital structures i.e. multiple classes of equity Income, asset or market approach of valuation used. Additionally, an allocation methodology is used to allocate the value arrived at using the valuation method. Involves detailed analysis of the rights and preferences for each class of share.

METHODS OF ALLOCATION

Per the AICPA (“The American Institute of Certified Public Accountants”) Accounting and Valuation guide on “Valuation of equity securities issued as compensation”, following are the commonly used methods for allocation of value amongst multiple classes of equity:

- Probability weighted expected returns method (PWERM)
- The Option Pricing Method (OPM)
- Current value method (CVM)
- Hybrid method

This newsletter discusses the option pricing method for an allocation of value exercise. Under the OPM, the Black Scholes Model (BSM) is used.

UNDERLYING PREMISE

The OPM for the purpose of allocating value to classes of equity is a classic example of a real option analysis. The equity value of the company is considered as the value of the underlying asset. The multiple classes of equity are treated as call options on the underlying asset. Considered the equity value of the company as the value of the underlying asset, each input to the BSM is modelled as follows:

- **Strike price** : In a standard option pricing analysis, the strike price represents the price that an option holder must pay to exercise the option. An option holder is likely to have some positive payoff when the price of the underlying stock crosses the strike price. Thus, the strike price can be considered as the floor value for the option holder. Based on this understanding, when modelling the option pricing model for the “equity value call option”, the strike price represents the minimum value of the company beyond which that specific class of equity has participative value in the company, i.e., the value at which it would be beneficial for the holder to convert their option to equity shares. The strike price is determined based on the assumption that the specific class of equity converts into equity share i.e., on a fully diluted basis. Essentially strike price is the value beyond which the option holder will start accruing value on their instrument.

The computation of strike price can be better understood with a few examples for different categories of equity as follows:

- **Equity**: The strike price of equity represents all the mandatory payments that the company must make in the event of a liquidation such as winding up or dissolution etc. For example, if the shareholder’s agreement specifies a liquidation preference of GBP 10 million to the existing preference shareholders, the strike price for the equity will be GBP 10 million.
- **Convertible preference shares**: The determination of the strike price is a function of the number of equity shares into which the preference shares are convertible and the conversion price per share. The strike price for participation for the shares is computed as the product of the fully diluted equity shares (post conversion) and the conversion price per equity share. The underlying assumption is that a preference shareholder shall opt for the conversion only in the event that the equity share value, post dilution exceeds the conversion price.
- **Employee stock options**: The determination of strike price for the employee stock options is in principle similar to that of convertible preference shares. It is based on the total diluted number of equity shares post exercise of the options and the exercise price per share. An additional adjustment that is performed is adjusting the strike price by reducing the cash inflow on exercise of the options. This is based on the assumption that out of the total value of the company, a portion of it will be brought in by the option holders by way of cash inflow.

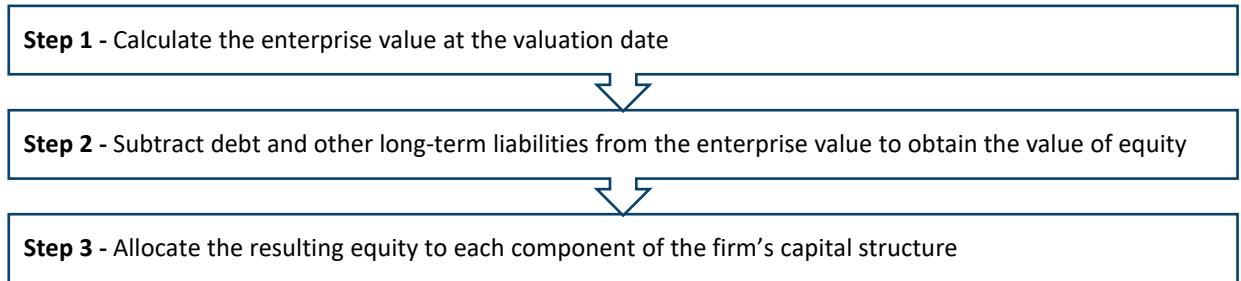
Determination of strike price is the preliminary step in the allocation exercise and requires a thorough understanding of the rights and preferences of the various classes of shares outstanding.

- **Time to liquidity**: Time to liquidity is one of the important inputs that require consideration in an allocation exercise. The time to liquidity is based on the expected future exit scenarios for the various classes of shares. Examples of exit scenarios include a change of control, dissolution or winding up etc. The time to liquidity can be based on either a single exit scenario or a probability weighted time to multiple exit scenarios per management input.
- **Risk free rate**: The risk-free rate must be commensurate with the expected time to liquidity considered in the analysis.
- **Volatility**: The volatility estimates are usually based on volatilities of peer group companies over the expected life of the option i.e., the time to liquidity in this case.

VALUATION PROCESS

The valuation of equity shares when there are multiple classes of shares and potentially dilutive shares in the capital structure of the Company requires further breakdown of the total equity value. The essential exercise for valuing the equity shares is first to determine the total value of total equity and then determine the percentage of equity allocated to the components of the capital structure - various series of preferred, common, warrants and options.

Equity Share valuations are typically conducted in three steps:



SPECIFIC ISSUES TO BE CONSIDERED

- **Back-solve method:** Generally, valuation of equity shares in a complex capital structure entails 3 steps as illustrated in the graph above. However, in the event that the company has had a recent round of funding involving an independent third party, the value can be derived using the back solve method. The back solve method requires considering the rights and preferences of each class of equity and solving for the total equity value that is consistent with a recent transaction in the company's own securities, considering the rights and preferences of each class of equity.
- **Equity value:** The equity value of the company which is considered as an input to the OPM, is considered on a control basis. This provides a consistent basis for comparison with the liquidation preferences of the preferred stock in the capital structure of the company.
- **Future financing:** The OPM does not consider dilution impacts of any potential future financings. That is to say, a company may have a reserved pool of options, however, only options outstanding or options that will be issued in the short term in the allocation exercise.
- **Discounts to equity:** Post allocation of value to the various classes of equity, the appraiser must consider whether any additional discounts such as discount for lack of control, discount for lack of marketability are applicable to the per share value. The applicability of these discounts require must be assessed by performing a detailed analysis of the rights and preferences associated with each class of equity.

ILLUSTRATION

A Company had the following capital structure as at the valuation:

Class of equity	No. of units outstanding
Series A preferred stock	8,056
Equity	15,505
Options	302
Warrants	326

The Company wants to determine the fair market value of the equity shares. Following are the assumptions used in the analysis:

- Underlying value = Equal to business equity value of GBP 4,162,803
- Strike price: Strike price for the various classes of shares has been determined as follows:

Part A: Capital structure

Description	No. of Shares	Preference capital (A)	Dividend %	Accrued & unpaid dividend (B)	Liquidation preference (A+B)	Equity Share equivalent	Conversion price
Equity	15,505	NA	NA	NA	NA	15,505	
Series A preferred	8,056	4,201,792	8%	1,765,443	5,967,235	9,445	631.82
Warrants	302	NA	NA	NA	NA	302	1,985.39
Options	326	NA	NA	NA	NA	326	1,985.39
Total						25,578	

Part B: Computation of strike price

Description	Equity	Preferred series A	Options and warrants
Liquidation preference of Preferred A	5,967,235	-	-
Claims to be paid before equity participation	5,967,235	-	-
Shares outstanding	15,505	24,950	25,578
Value per share for conversion	-	631.82	1,985.39
Less: Cash proceeds	-	-	(1,246,825)
Strike price for participation	5,967,235	15,763,604	49,534,522

- **Time to liquidity:** The management projects that the preference shares will convert into equity shares within a period of one year from the valuation date. Thus, the time to liquidity has been assumed to be one year in the analysis.
- **Risk free rate:** A risk-free rate of 0.17% based on the yield on US Government Treasury bond with a maturity period of one year, which corresponds with the time to liquidity as at the valuation date has been considered.
- **Volatility:** The median annualized historical volatility of comparable companies over the preceding one year the valuation date has been considered. The volatility assumption has been considered commensurate with the time to liquidity.

Based on the inputs above, the option pricing model is as follows:

Description	Underlying value	Strike price	Time to liquidity	Risk free rate	Volatility	D1	D2	Call option price	Tranche Value
call option 1 – Equity	4,162,803	-						4,162,803	3,739,465
call option 2 - Preferred series A	4,162,803	5,967,235	1	0.17%	55%	(0.37)	(0.92)	423,337	411,363
call option 3 - Options and warrants	4,162,803	15,763,604	1	0.17%	55%	(2.12)	(2.67)	11,974	11,968
	4,162,803	49,534,522	1	0.17%	55%	(4.18)	(4.74)	7	7

ALLOCATION OF VALUE

Description	Tranche value	Applicable classes	Applicable shares	Preferred Series A	Equity	Options and warrants
Call option 1 - Equity	3,739,465 411,363	Preferred Series A Equity	9,445 15,505	100%	100%	
Call option 2 - Preferred Series A	11,968	Equity and preferred Series A	24,950	38%	62%	
Call option 3 - Options and warrants	7	Equity, preferred Series A and options and warrants	25,578	37%	61%	2%
Value conclusion				3,743,998	418,805	0.16
Per share value				396.42	27.01	0.00
Minus: Discount for lack of control ("DLOC") @15%					(4.02)	
Value per share on a minority marketable basis					22.99	
Minus: Discount for lack of control ("DLOM") @ 22%					(5.01)	
Value per share on a minority non-marketable basis					17.97	

The recent rise in the number of early-stage companies has led to varied classes of shares being issued to different classes of investors, making the application of the allocation exercise inevitable. The OPM is a methodology with an intuitive logic and thus is one of the preferred methods for allocation. Our next newsletter shall discuss the other methods for allocation of value.

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