MOORE

PREFERRED SHARES VALUATION

VALUATION METHODS FOR PREFERRED SHARES

Valuing preferred shares differs from valuing ordinary shares due to their features, such as the payment of preferred dividends, the rights to convert the preferred shares into ordinary shares at (favourable) prices and the preferred rights to receive repayment upon liquidation events ("liquidation preference"). In addition, different classes of preferred shares and/or other convertible securities with varying rights may exist. All these features, alone or together, render valuations of preferred shares much more complicated. In short, widely-known valuation methods for preferred shares include:

WIDELY-KNOWN PRACTICES FOR VALUING PREFERRED SHARES

Current Value Method (CVM)	Probability Weighted Expected Return Method (PWERM)	Option-Pricing Method (OPM)
The CVM estimates the company's total equity value on a controlling basis and subtracts the value of the preferred shares based on their liquidation preferences or conversion values. The residual is then allocated to common shareholders.	The PWERM assesses the value of preferred shares through the probability-weighted average of different possible future outcomes under the circumstances such as IPO, liquidation, merger or sales.	The OPM is a commonly adopted method for allocating equity value between common and preferred shares. The features of allowing preferred shareholders to claim on equity value can translate or resemble options. In general, the OPM relies on the Black-Scholes-Merton model (the "BSM").

The crux of the valuation of preferred shares is deriving the expected value, under various levels of the business' valuations, across certain scenarios (the "exit events") that give rise to a distribution of assets and earnings. Common exit events include liquidation events, redemption events and sale events, whereby preferred shares realise their values with a higher priority to claim on assets and earnings.

The CVM, PWERM and OPM methods take different approaches in deriving the expected values under the possible exit events. Theoretically, the PWERM accounts for all possible exit events, while the CVM has practical limitations and generally will only be used when:

1. A liquidity/sale event is imminent; and
2. There are reasonable bases to estimate the value beyond the preferred preferences.

In practice, the CVM is therefore not commonly adopted.

OPM IS WIDELY-ADOPTED BY VALUATION PRACTITIONERS

In fact, the OPM is perceived to be the most widely adopted method in practice by valuation practitioners, likely because the OPM can be used to model future liquidation events, according to various terms of shareholder agreements, such as liquidation preference, seniority, conversion ratio and equity value allocation. The OPM was proposed by the American Institute of Certified Public Accountants (AICPA) in the publication[1] titled "Valuation of Privately-Held-Company Equity Securities Issued as Compensation" in 2004.

Under the OPM, different classes of preferred and ordinary shares are modelled as call options that entitle holders to the exercisable rights to convert the instruments into common shares. While the different classes of equity have different priorities for the claim on net assets upon liquidation events, liquidation preferences relating to the instruments are based on the capital structure and the shareholders' rights. At various levels of payoff values upon a liquidation event, the values of trigger points for conversion of the instruments are considered as their respective liquidation preference thresholds and are therefore modelled as the strike prices of the corresponding call options.

Despite its popularity, the OPM has its limitations:
1. It models the equity instruments as options that could only be exercised at maturity, while in reality the possible exit events could take place well before the modelled maturity period.
2. Exotic features such as put/call options and the possibilities of multiple simultaneous exit events are not considered in the OPM.
3. The OPM requires quite a number of parameters by using the BSM, where, for instance, small deviation in the adopted volatility, time to maturity could result in a relatively large deviation in the valuation results of the respective equity instruments.

KEY CONSIDERATIONS FOR ADOPTING THE OPM

Determine equity value of the business
The total amount that equity holders would receive in an exit event. In practice, it is usually done separately in a detailed valuation engagement in practice.

(A) Market Approach   (B) Income Approach   (C) Asset Approach

Understand the capital structure
Understand and assess the conversion features of preferred shares and the underlying terms and conditions.

(2.1) How much debt? → (2.2) What are the equity instruments? → (2.3) Any conversion features these equity instruments have? → (2.4) What are the terms and conditions?

Determine the parameters for the BSM
Including volatility, risk-free interest rate, dividend yield, spot price, time to expiration, and strike price (the "6 key parameters"). These parameters could be largely different for the call options which correspond to various classes of the equity instruments. It is critical to fully understand the conversion features and liquidation preferences of the preferred shares in order to determine the respective strike prices of the call options when applying the BSM.

(3.1) Determine the timing of the liquidation scenario → (3.2) Determine the conversion scenarios → (3.3) Derive the 6 key parameters for all of the equity instruments

Allocating value
With reference to the strike prices of the various classes of equity instruments, the equity value for different equity levels could then be derived with the BSM. Under each tranche of equity levels, equity values are then allocated base on the proportion of the underlying entitlement of conversion to common shares

(4.1) Apply the BSM to determine the option values → (4.2) Determine the tranche values → (4.3) Allocate equity values among each tranche based on as-if converted number of common shares

1. https://us.aicpa.org/interestareas/fairvaluemeasurement/resources/valuation-of-privately-held-company-equity-securities-issued-as-compensation

ILLUSTRATIVE EXAMPLE

Consider a company with non-participation debt (no conversion features), common shares and two classes of preferred shares, namely series B and series A preferred shares. Assume it is agreed and mandated that, upon a liquidation event, series B will have higher priorities than series A for claims on equity up to the shareholders' original investment amount, and after both series B and A shareholders have claimed up to their original investment amounts, the common shareholders can claim for residual equity value. Both series B and series A shares have the conversion features that their conversion prices are set the same as their respective issue prices on a one-to-one basis. Below are the illustrative parameters of the capital structure:

Table 1: Illustrative parameters of the capital structure

Debt					Full Amount ($)
Borrowings (including outstanding interest payments)					50,000,000
Equity Class	**Issue Price ($)**	**Shares Outstanding**	**% of shares (as converted basis)**	**Liquidation Price ($)**	**Liquidation Preference ($)**
Series B Shares	4.50	30,000,000	30.00%	4.50	135,000,000
Series A Shares	3.00	30,000,000	30.00%	3.00	90,000,000
Ordinary Shares		40,000,000	40.00%	N/A	N/A
Total		**100,000,000**	100.00%		

In this example, the company has $50 million of borrowings, which have to be fully repaid before any available financial resources can be claimed by any equity holders since debt holders have the highest priorities for claims on assets. The liquidation prices here are the same as the issue prices of the respective preferred shares since it is assumed that the maximum claim amounts are the respective original investment amounts. The term "liquidation preference" refers to the dollar amounts of the maximum claim in a liquidation event to which a class of equity shareholders is entitled to.

In addition, series B shareholders can convert their shares to the same number of common shares if the common share price is at $4.5 or above. The same logic applies to series A shareholders with their conversion prices at $3. It should be noted that the common share price would be $0 until equity value exceeds the total original investment amounts of both series B and series A preferred shares.

The OPM can then be applied with the BSM, of which the parameters are listed in Table 2 below:

Table 2: Parameters relating to the BSM

Inputs	Call Option 1 Series B	Call Option 2 Series A	Call Option 3 100% Common	Call Option 4 Series A Convert	Call Option 5 Series B Convert
Spot Price ($)	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000
Volatility	30.00%	30.00%	30.00%	30.00%	30.00%
Risk-Free Rate	1.50%	1.50%	1.50%	1.50%	1.50%
Strike Price ($)	0	135,000,000	225,000,000	345,000,000	450,000,000
(sum of respective instruments' liquidation preferences)			*(135,000,000+ 90,000,000)*	*(135,000,000+ 3*(30,000,000+ 40,000,000))*	*(4.5*(30,000,000+ 30,000,000+ 40,000,000))*
Time to Liquidity (year)	3.0	3.0	3.0	3.0	3.0
Dividend ($)	-	-	-	-	-
Option Value ($)	300,000,000	173,133,541	105,360,944	50,688,714	26,449,567
Tranche Value ($)	126,866,459	67,772,597	54,672,230	24,239,147	26,449,567

In Table 2, there are 5 call options as there are 5 separate tranches that equity values will be allocated according to the priorities of the claims discussed above. As series B shareholders have the highest priorities on claims, Call Option 1 is the first tranche to be allocated to equity values upon a liquidation event, followed by Call Option 2 to 5 accordingly. The spot prices are illustrated to be at $300 million, which is the equity value available to be claimed by the equity shareholders after all the company's debt had been repaid to the creditors. In practice, such total equity values are determined in a separate valuation engagement by using various valuation methodologies or taking reference from the quoted share prices if the company is publicly listed (see the above figure). Lastly, the strike prices are the thresholds of values that the respective tranches become in-the-money, which refers to the minimum equity values that the respective class of equity starts to have payoffs by having equity values allocated to their holders. As a result, the option values are derived using the BSM, while the differences in option values among the call options relates to their respective tranche values, which are the allocated equity values for the respective tranches.

For Call Option 4 and Call Option 5, while we assume both classes of the preferred shares have conversion prices same as their issue prices, we further assume the preferred shareholders would convert all their shares into common shares once the conversion prices are reached.

Table 3: Allocation results with the OPM

Hierarchy	Applicable Class	Strike Price ($)	Tranche Value ($)	Series B	Series A	Common Shares
1	Series B	0.00	126,866,459	100%	-	-
2	Series A	135,000,000	67,772,597	-	100%	-
3	100% Common	225,000,000	54,672,230	-	-	100%
4	Series A Convert	345,000,000	24,239,147	-	43%	57%
5	Series B Convert	450,000,000	26,449,567	30%	30%	40%
	# of Shares		300,000,000	134,801,329	86,095,673	79,102,998
	Value Per Share ($)		**3.00**	**4.49**	**2.87**	**1.98**

Table 3 shows how each tranche's value is allocated to the applicable equity instruments on an as-if converted basis. Then the total equity values of the equity instruments are the sum of the allocated values across their applicable tranches.

Chart 1: Allocation of equity values
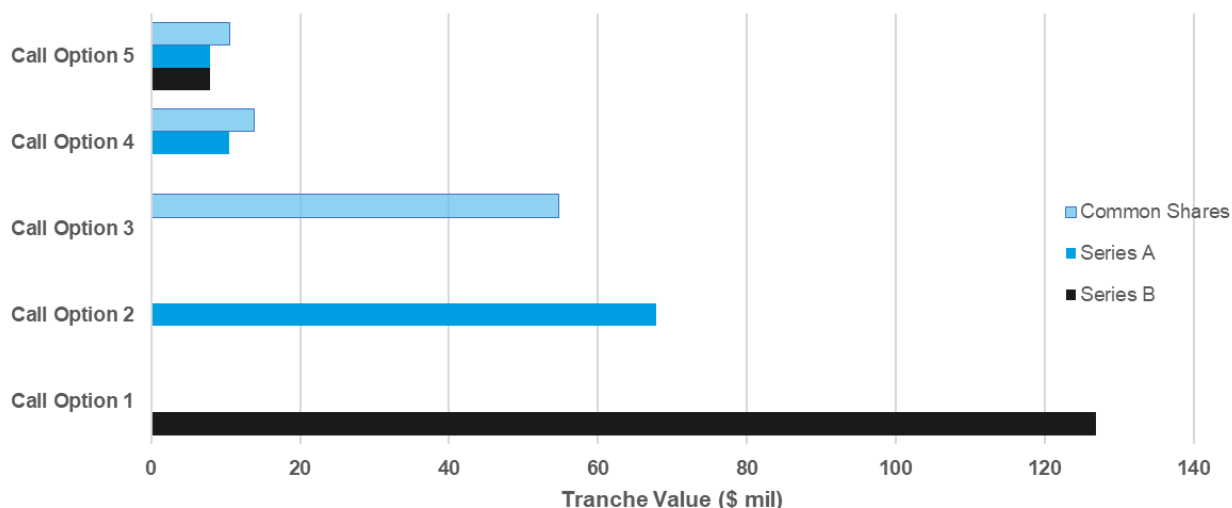
CONCLUSION

In practice, in order to account for the possibilities of different scenarios of exit events, hybrid forms of the OPM and PWERM may be adopted by valuation specialists. The ever-changing economic and regulatory environment has added more complexity to capital structures. Stakeholders should stay vigilant to the changes in capital structure and shareholders' rights to understand the impact on their stakes and the financials of the company.

HOW WE CAN HELP

Moore Transaction & Valuation professionals advise clients of any size, from small owner-managed businesses to mid-sized quoted companies and large corporates. Harnessing our local expertise and cross-border capability of our global network, we have built a strong and proven track record of providing advisory services to businesses across a wide variety of industry sectors. Should you wish to obtain guidance on preferred share valuation and other transaction advisory matters, please contact us.

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