

Value of Equity and Per Share Value when there are options and warrants outstanding

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Equity Value and Per Share Value: A Test

- Assume that you have done an equity valuation of Microsoft. The total value for equity is estimated to be \$ 170 billion and there are 1204 million shares outstanding. What is the value per share?

An added fact

- On September 30, 1997, Microsoft had 258 million options outstanding, granted to employees over time. These options had an average exercise price of \$ 42 (the current stock price is \$ 140). Estimate the value per share.

Equity Value and Per Share Value

- The conventional way of getting from equity value to per share value is to divide the equity value by the number of shares outstanding. This approach assumes, however, that common stock is the only equity claim on the firm.
- In many firms, there are other equity claims as well including:
 - warrants, that are publicly traded
 - management and employee options, that have been granted, but do not trade
 - conversion options in convertible bonds
 - contingent value rights, that are also publicly traded.
- The value of these non-stock equity claims has to be subtracted from the value of equity before dividing by the number of shares outstanding.

Warrants

- A warrant is a security issued by a company that provides the holder with the right to buy a share of stock in the company at a fixed price during the life of the warrant.
- A warrant is therefore a long term call option on the equity of the firm and can be valued using option pricing models.
- Warrants and other equity options issued by the firm are claims on the equity of the firm and have to be treated as equity, which has relevance for:
 - estimating debt and equity for the leverage calculation
 - estimating per share value from total equity value

Why firms use warrants and options

- Warrants are priced based upon the implied volatility assigned to the underlying stock; the greater the volatility, the greater the value. To the degree that the market overestimates the firm's volatility, the firm may gain by using warrants and option-like securities.
- Warrants, by themselves, create no cash obligations at the time of the issue. Consequently, issuing warrants is a good way for a high growth firm to raise funds, especially when current cash flows are low or non-existent.
- For financial officers who are sensitive to the dilution created by issuing common stock, warrants seem to provide the best of both worlds — they do not create any new additional shares currently, while they raise equity investment funds for current use.

Convertible Bonds

- A convertible bond is a bond that can be converted into a pre-determined number of shares, at the option of the bond holder.
- While it generally does not pay to convert at the time of the bond issue, conversion becomes a more attractive option as stock prices increase.
- A convertible bond can be considered to be made up of two securities - a straight bond and a conversion option.
- Firms generally add conversions options to bonds to lower the interest rate paid on the bonds.

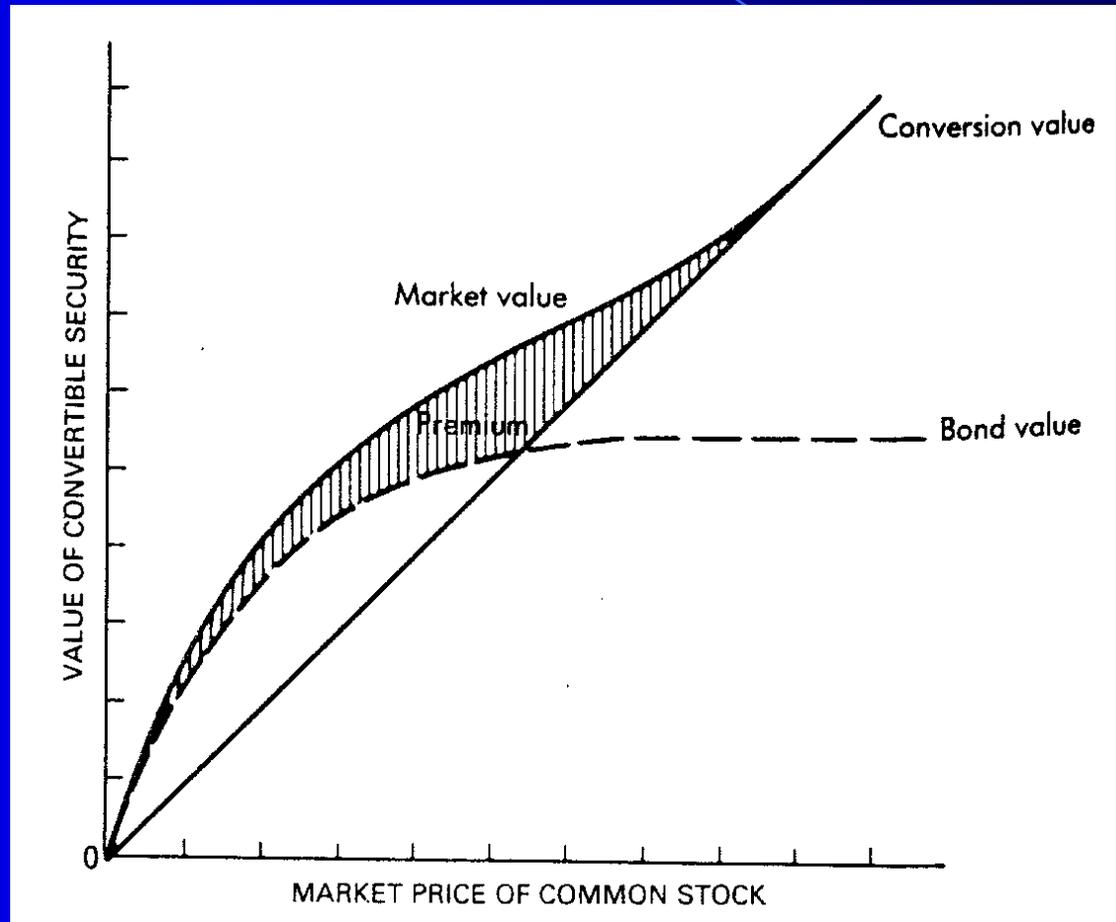
The Straight Bond Component

- Embedded in every convertible bond is a straight bond component.
- The easiest way to value the straight bond component is to act as if the conversion option does not exist and value the bond. This can be accomplished as follows:
 - Step 1: Obtain the coupon rate on the convertible bond (which will generally be low because of the conversion option)
 - Step 2: Estimate the interest rate that the company would have had to pay if it had issued a straight bond. This can be obtained either from other bonds that the company has outstanding or from its bond rating.
 - Step 3: Using the maturity of the convertible bond, the coupon rate and the market interest rate, estimate the value of the bond as:
Value of Bond = PV of coupons at market interest rate + PV of face value of bond at market interest rate
- The straight bond component is clearly debt.

The Conversion Option

- In a typical convertible bond, the bondholder is given the option to convert the bond into a specified number of shares of stock. The conversion ratio measures the number of shares of stock for which each bond may be exchanged. Stated differently, the market conversion value is the current value of the shares for which the bonds can be exchanged. The conversion premium is the excess of the bond value over the conversion value of the bond.
- The conversion option in a convertible bond is equity.

Convertible Bond Value and the Conversion Option



Determinants of Value of Conversion Option

- The conversion option is a call option on the underlying stock, and its value is therefore determined by the variables that affect call option values –
 - the underlying stock price,
 - the conversion ratio (which determines the strike price),
 - the life of the convertible bond,
 - the variance in the stock price and
 - the level of interest rates.

Factors in Using Option Pricing Models to Value Convertibles and Warrants

- Option pricing models can be used to value the conversion option with three caveats –
 - conversion options are long term, making the assumptions about constant variance and constant dividend yields much shakier,
 - conversion options result in stock dilution, and
 - conversion options are often exercised before expiration, making it dangerous to use European option pricing models.
- These problems can be partially alleviated by using a binomial option pricing model, allowing for shifts in variance and early exercise, and factoring in the dilution effect

Steps in Getting to Value Per Share

- Step 1: Value the firm, using discounted cash flow or other valuation models.
- Step 2: Subtract out the value of the outstanding debt to arrive at the value of equity. Alternatively, skip step 1 and estimate the value of equity directly.
- Step 3: Subtract out the market value (or estimated market value) of other equity claims:
 - Value of Warrants = Market Price per Warrant * Number of Warrants :
Alternatively estimate the value using OPM
 - Value of Conversion Option = Market Value of Convertible Bonds -
Value of Straight Debt Portion of Convertible Bonds
- Step 4: Divide the remaining value of equity by the number of shares outstanding to get value per share.

An Example: Valuing Sterling Software

- Step 1: Value the firm

- Approach used: Three Stage FCFE Model

- Inputs used

	High Growth	Transition Phase	Stable
Phase			
Length	5 years	3 years	Forever
Growth Rate	20%	Linear drop	6%
Cap Ex/Depreciation	2.00	2.00	1.00
Working Capital	15% of Revs	15% of Revs	15% of Revenues
Beta	1.50	Linear drop	1.10
Debt Ratio	Current	Current	Current

Current Debt Ratio Calculation

- Convertible Debt has market value of \$ 175 million; face value of \$ 115 million; coupon rate of 5.75%; expires in 8 years;
 - Bond Rating is A-; Interest rate on comparable debt = 8.50%;
 - Coupon on Convertible Debt = $.0575 * 115 \text{ million} = \$ 6.6125 \text{ million}$
 - Value of Straight Debt Portion of Convertible Debt = \$ 6.6125 (PV of Annuity, 7.5%, 8 years) + \$ 115 million / 1.0758 = \$ 103.21 million
 - Value of Conversion Option in Debt = Market Value of Convertible Debt - Straight Debt Portion = \$ 175 - \$ 103 = \$ 72 million :Equity
- Value of Warrants = Number of warrants * Warrant Price = 1.8 million warrants * \$ 30 = \$ 54 million
- Total Market Value of Equity = (\$ 56 * 25.50 million shares) + \$ 72 + \$ 54 = \$ 1554 million
- Value of Debt = \$ 103 million
- Debt Ratio = $\$ 103 / (\$ 103 + \$ 1554) = 6.22\%$

Value Per Share: Sterling Software

Value of Equity from Three-Stage FCFE Model	= \$2,036 million
- Value of Equity in Convertible Debt	= \$ 72 million
- Value of Equity in Warrants	= \$ 54 million
Value of Equity in Common Stock	= \$ 1,910 million
/ Number of Shares outstanding	= 25.50 million
Value per Share	= \$ 74.90