CHAPTER III

LITERATURE REVIEW

3.1. Convertible Bonds

Convertible securities are fixed income securities that permit the holder the right to acquire the common stock of the issuing corporation under specified conditions rather than by direct purchase in the stock market. The terms at which the security can be exchanged for the issuer's common stock are set forth in the bond indenture. The option to convert is solely at the discretion of the holder and will only be exercised when and if the holder finds such an exchange desirable. (Fabozzi, 1995, p. 290). Many of convertible bonds contain call provisions, allowing firms to call their debt if certain conditions are satisfied. (Lyandres, 2006, p. 2). An important factor for firms engaging in a debt to equity swap (conversion) is that they are usually in financial distress. (Graham, 2004, p. 17)

The following factors must be considered when evaluating convertible securities: (Fabozzi, 1995, p. 297)

1. The appreciation in price of the common stock that is required before conversion could become attractive; measured by the conversion premium ratio.
2. The prospects for growth in the price of the underlying stock.
3. The downside potential in the event that the conversion privilege proves valueless
4. The yield sacrifice required to purchase the convertible

5. The income advantage offered through acquiring the convertible bonds rather than the number of common shares that would be obtained through conversion.
6. The quality of the security being offered.
7. The number of years over which the conversion premium paid to acquire the convertible will be recouped by means of the favorable income differential offered by the convertible relative to the underlying common stock.

The convertible security contract will state either a conversion ratio or a conversion price. A conversion ratio directly specifies the number of shares of the issuing firm's common stock that can be obtained by surrendering the convertible security. Alternatively, the conversion rate may be expressed in terms of a conversion price – the price paid per share to acquire the underlying common stock through conversion. The conversion ratio may then be determined by dividing the stated conversion price into the par value of the security:

$$\text{Conversion ratio} = \frac{\text{Par value of security}}{\text{Conversion Price}}$$

If conversion price is higher than the current market price of a common share, the bond is selling at a conversion premium, represented by the excess costs per share to obtain the common stock through conversion. (Fabozzi, 1995, p. 298)

The value of a convertible bond if it is converted immediately into the common stock of the issuer is called its conversion value. This value is found by

multiplying the conversion ratio by the current market price of the common stock. (Fabozzi, 1995, p. 304)

Rather than conversion value, we can calculate bonds straight value if they are not converted into stock: (Damodaran, 2001, p. 123)

$$\text{Bond value} = \sum \frac{\text{Coupon}}{(1+kd)^t} + \frac{\text{Par Value}}{(1+kd)^N}$$

where kd is the market interest rate given the default risk.

The appropriate discount rate here will include the risk less rate and an appropriate premium for the default risk called a default spread. Independent rating agencies such as Standard and Poor's and Moody's measure the default risk and give the bonds a rating that measures the default risk. Rating description can be seen at Appendix A-6. In line with bond's rating, the default spread was determined as follows:

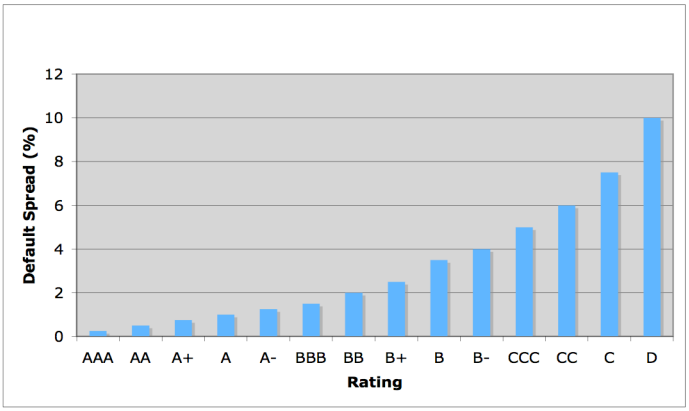

Figure 3.1 : Default Spread
Source : www.bondsonline.com

3.2 Firm Valuation

To understand how shareholder value is created we must first understand how firms are valued in the capital markets.

The free cash flow model for valuing a firm provides a method for analyzing value as the present value of the firm's projected cash flows for all future years (1 through infinity). The value of the firm under this circumstance is reflected in the following model:

$$\text{Firm value}^{11} = \frac{\text{free cash flow}_1}{(1+k_{wacc})^1} + \ldots\ldots + \frac{\text{free cash flow}_n}{(1+k_{wacc})^n} + \frac{\text{terminal value}}{(1+k_{wacc})^n}$$

$$\text{Terminal value} = \frac{\text{free cash flow}_{n+1}}{k_{wacc}}$$

[11] Free cash flow = Free Cash Flow to Firm (FCFF)

Table 3.1 : Calculation of Free Cash Flow

CALCULATION OF FREE CASH FLOW	EXPLANATION
Net Operating Income (NOI)	Estimated as revenues less cost of goods sold and operating expenses.
Less: taxes	Taxes estimated on the level of NOI
Equals: net operating income after tax	NOPAT
Plus: depreciation expense	Add back non cash depreciation
Less: new investments made during the period additional net working capital. Capital expenditures (CAPEX)	Increases in current assets less accounts payable and other non interest-bearing liabilities. New investments made in plant and equipment during the period
Equals: free cash flow	Cash available to pay dividends, interest and principal.

(Keown, et al, 2005, p. 439)

This valuation is also called Discounted Cash Flow Valuation.

A firm in financial distress has some or all of the following characteristics: negative earnings and cash flows, an inability to meet debt payments, no dividends, and high debt/equity ratios. (Damodaran, 2006, p. 180). This makes it difficult to apply discounted cash flow models to these firms. The solution to the problems depends, in large part, on how distressed the firm really is. If the distress is not expected to be fatal (in the sense of pushing the firm into liquidation), there are a variety of potential solutions. If, on the other hand the distress is likely to be terminal, finding a solution is much more difficult.

3.3 Capital Structure

Capital Structure represents the proportion of capital from different sources. In a simplified context, it is the proportion of financing from debt and from equity capital. Common ratios such as debt to total capital or debt to equity quantify this relationship. (Groth and Anderson, 1997, p. 553; Brounen, 2001, p. 2)

The capital structure decision centers on the allocation between debt and equity in financing the company. An efficient mixture of capital reduces the price of capital. Lowering the cost of capital increases net economic returns, which ultimately, increases firm value. An "unlevered firm" uses only equity capital. A levered firm uses a mix of equity and various forms of liabilities.

1. **Debt or Liabilities**

   Represent the value of the creditors' stake in the firm. The value of debt represents the discounting and summing of all current and future payments the company has promised to creditors. These liabilities take various forms and have different claim positions with regard to the cash flows and assets of the company. At this stage recognize that creditors have claims against the company and these claims always are ahead of the stockholders.

2. **Equity**

   Represents the value of the shareholder interests. Stockholders always have last

claim on the results of economic activities. Stockholders are residual claimants. Equity value represents the discounted summation of all current and future residual cash flows of the company.

3. Total capital

Equals the amount of financing from all sources. Total capital on an economic balance sheet is the sum of equity capital and debt capital of all forms. This total equals the sum of all assets on the balance sheet.

According to Brigham & Houston, 2004, p. 478, there are four primary factors influence capital structure decisions:

a. Business Risk, or the riskiness inherent in the firm's operations if it used no debt. The greater the firm's business risk, the lower its optimal debt ratio.
b. The firm's tax position. A major reason for using debt is that interest is tax deductible, which lowers the effective cost of debt. However, if most of a firm's income is already sheltered from taxes by depreciation tax shields, by interest on currently outstanding debt, or by tax loss carry-forwards, its tax rate will be low, so additional debt will not be as advantageous as it would be to a firm with a higher effective tax rate.
c. Financial flexibility, or the ability to raise capital on reasonable terms under adverse conditions.
d. Managerial conservatism or aggressiveness. Some managers are more aggressive than others, hence some firms are more inclined to use debt in an effort to use

profits. This factor does not affect the true optimal, or value maximizing, capital structure, but it does influence the manager-determined target capital structure.

In order to determine optimal capital structure, a firm needs to calculate its weighted average cost of capital, WACC. The weighted average cost of capital is the weighted average of the after-tax costs of each of the sources of capital used by a firm to finance a project where the weights reflect the proportion of total financing raised from each source. The weighted average cost of capital for a firm that uses only debt and common equity using the following quotation:

$$\text{Weighted Average cost of capital} = \left\{\text{after-tax cost of debt} \times \text{proportion of debt financing}\right\} + \left\{\text{cost of equity} \times \text{proportion of equity financing}\right\}$$

Where:

$$\text{Cost of Equity} = k_c = k_{rf} + \beta(k_m - k_{rf})$$

$$\text{Cost of Debt} = k_d\,(1 - \text{tax rate})$$

where k_{rf} is is risk free rate and k_m is expected returns on the market index (Keown, Martin et al, 2005, p. 414). β is calculated using simple linear regression. (Levine et al, 2005, p. 513)

The weighted average cost of capital (WACC) reflects the cost of getting part of total capital from equity and the remainder from debt or other sources. (Groth and Anderson, 1997, p. 4)

In order to estimate the discount rate for the above calculation, we shall measure risk premium. There are three fundamentals that determine the size of this premium: (Damodaran, 2006, p. 23)

1. Variance in the underlying economy: risk premiums will be larger in economies that have more volatility associated with them. Thus, the premiums for emerging markets, with their higher-growth, higher-risk economies, will be larger than the premiums for developed markets.
2. Political risk: risk premiums will be larger in those markets where there is potential for political instability, which translates into economic instability.
3. Structure of the market: There are some markets where the risk premium for investing in stocks will be lower because the companies are listed on the exchange are large, diversified, and stable (Germany and Switzerland would be good examples). In general, as smaller and riskier companies get listed on the market, the average risk premium for investing in stocks will increase.

Table 3.2 : Risk Premium

Financial Market Characteristics	Premium Over Government Bond Rate
Emerging markets with political risk (South American, East European markets)	8.5% over govt. bond rate
Emerging markets (Mexico, Asian markets other than Japan)	7.5% over govt. bond rate
Developed markets with wide listings (United States, Japan, Britain)	5.5% over govt. bond rate
Developed markets with limited listings (Western Europe, minus Germany and Switzerland)	4.5% - 5.5% over govt. bond rate
Developed markets with limited listings and stable economies (Germany, Switzerland)	3.5% - 4% over govt. bond rate