#### How Does the Conversion Privilege Effect a Bond's Risk Premium?

Wesley M. Jones, Jr. The Citadel <u>wes.jones@citadel.edu</u> George S. Lowry, Randolph-Macon College <u>glowry@rmc.edu</u>

## Abstract

Corporate bond indentures often contain various provisions and covenants that are designed to benefit one party or the other to the bond agreement. This study will examine the effect of a bond having a conversion provision in its indenture on the offering yield that the issuer pays on the bond in the primary market. The results of this study can have a practical application to bond issuers in that if the study reveals that no offering yield reduction results from the presence of a conversion privilege, then the issuer may decide to omit the option to the bondholder. Thus reducing ownership dilution that results from the exercise of the "de facto" call options on the company's stock that result from the bond's conversion privilege

### Introduction

Corporate bond indentures often contain various provisions and covenants that are designed to benefit one party or the other to the bond agreement. Indenture provisions such as the call provision, which allows the issuer to redeem the bond early in the event of a lower interest environment, have been associated with lower bond offering prices and higher offering yields. [See for example: Allen, Lamy and Thompson (1987), and Jones (2001)].

Most indenture provisions, however, are designed to make the bond more attractive to the investor and thus enhance the price and lower the offering yield. For example, the imposition of restrictions on the issuer subsequent to the bond being issued are placed so that investors will perceive the contract as less risky and be willing to pay a higher price for the bond at issue. This

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lowers the relative interest rate that the issuer will be required to agree to over the life of the bond.[See for example: Jones (1998)].

Another provision that is sometimes included in the bond's indenture is the conversion privilege. The conversion privilege gives the bond's holder the option to convert the bond into a specified number of shares of the company's stock. This acts essentially as a call option to the bondholder on the company's stock and allows the bondholder to participate in share price appreciation resulting from the company's investments if they so desire.

For example: A bond is sold in the primary market for it's face value of \$1,000. At the time the bond is issued, the issuing company's stock is trading for a price of \$35 per share. The bond contains a conversion privilege that allows the bond holder to convert the bond to 25 shares of stock (the conversion ratio). Since the conversion ratio of the conversion privilege remains constant, the bondholder now has a call option on the company's stock at a strike price of \$40 per share (\$1,000/\$25 = \$40) and the option is currently out of the money (strike price > market price). Most convertible bonds are issued with the conversion option "out of the money." However, if the bondholder believes that price appreciation in the company's stock is likely to occur, then the value of the conversion option will increase the value of the bond, and make them more likely to pay a higher offering price for the bond. This will lower the offering yield that the issuer will be required to pay.

#### The Model

To examine the effect of a bond having a conversion provision in its indenture on the offering yield that the issuer pays on the bond in the primary market the following model is specified.

$$OTY: \quad \mathbf{I}_{0} + \begin{bmatrix} & \mathbf{I}_{i} EV_{i} + \mathbf{I}_{1}Conv \end{bmatrix}$$

where OTY is the off treasury yield (the difference between the issue's offering yield, and the yield on three month treasury securities on the same date) in basis points. Measuring "off treasury" yield controls for the general level of interest rates and recognizes that potential investors retain the option of "parking" their money in short term risk free assets in the event that other investment opportunities are perceived as less than optimal. The EVi represent a vector of other explanatory variables that are included either as the result of theory or prior empirical work. These explanatory variables include call protection, term to maturity, issue size, issue rating, whether the issue is dually or split rated, and the volatility of the stock market in the period preceding the issue<sup>1</sup>:

CALL is a dichotomous grouping variable that is set to one if the issue is callable prior to maturity and zero otherwise. The call grouping variable is included in the analysis because the ability to call an issue early represents an option to the issuing firm that has a positive value which will accrue from some other party, in this case, the purchaser of the bond. In addition, the ability to call the issue early raises the possibility that under conditions of falling market rates, the very condition under which the holder of the bond will want to keep it, the bond issue may be prematurely recalled forcing the holder to reinvest at a lower rate (reinvestment rate risk). These arguments suggest that the relationship between the call grouping variable and a bond's excess yield should be positive.

<sup>&</sup>lt;sup>1</sup>See Allen, Lamy and Thompson (1990), Altinkilic and Hansen (2000), Billingsley, Lamy, Marr and Thompson (1985), Blackwell, Marr, and Spivey (1990), Chatfield and Moyer (1986), Ederington (1986), Jewell and Livingston (1998), Liu and Moore (1987), Livingston et al. (1995) Logue and Rogalski (1979) Sorensen (1979), Rogowski and Sorensen (1985), and Livingston and Miller (2000).

TERM is the natural log of the number of years to maturity of the issue. This variable is included as a proxy for the interest rate risk of the issue. Because Macaulay's duration typically increases with maturity at a decreasing rate it is assumed that interest rate risk rises with time to maturity. Therefore, it is expected that longer term issues will have a higher required yield than shorter term issues to compensate for the additional interest rate risk.

SIZE is the natural log of the proceeds of the issue. This variable is included as a proxy for the liquidity risk of the issue. Fisher (1959) suggests that the amount of debt issued will have an impact on the liquidity risk of the issue. This impact can be either positive or negative. Larger issues may be traded more frequently thus reducing the liquidity risk of the issue or a large issue may have a negative price impact increasing liquidity risk.

Default risk is proxied by the issue's Standard and Poor's rating. While each issue in the sample has a rating from both Moody's and Standard and Poor's, previous work by Jones (1998) suggests that the market places greater weight on the rating of Standard and Poor's, therefore, the S&P rating is used to categorized issues with respect to default risk. The issues are placed into one of five default risk groups. The five groups are: Prime (AAA and AA+), Very High Grade (AA to A+), Upper Medium Grade (A and A-), Lower Medium Grade (BBB+ to BBB-) and Speculative (BB+ and lower). Five dummy variables are assigned a value of 1 or 0 depending upon in which category the issue's S & P rating falls. Alternatively, default risk is proxied by assigning a numerical equivalent to each of the rating categories (i.e. AAA = 1, AA = 2,... and so on to CCC = 7).

SPLIT is dummy variable set equal to one if the issue is rated differently by Moody's and Standard and Poor's and zero otherwise. Billingsley et. al. (1985) examined 258 bond issues floated between January 1977 and June 1983, 12.9% of which were split rated. Their study found Page 4 of 7 that investor's perceive split rated issues as more risky than non split rated issues. It is therefore expected that split rated issues will have a higher yield than non split rated issues [See also Ederington (1986), Liu and Moore (1987) and Jones (1998)].

MKTVOL is a continuous variable whose value equals the natural log of the variance of returns on the Dow Jones Composite Average over the 30 days prior to the bond's issue date. This variable is included to account for investor's preferred investment habitat and innate desire to avoid risk (See Mishkin 1995 pp. 159.). Investors have the ability to change their preferred maturity structure, and as longer term maturity investments such as stocks become more volatile, it is expected that relatively shorter term investments such as bonds will become more attractive. Hence, as the stock market's volatility increases, investors should be willing to pay more for bonds in general, and bond prices should rise causing yields to fall. It is expected that the coefficient of MKTVOL will be negative.

CONV is a binary indicator variable that is set to one if the issue is convertible to stock at the discretion of the holder. This is the variable of interest, and it is expected that convertible feature will be associated with higher bond prices and lower required yields as described above.

#### The Data

The data for the study is a sample of 3600+ bond issues dated from December of 1982 until June of 1993 approximately 10% of which contain a conversion privilege. Other bond characteristics and issuer characteristics that have been shown from theory or prior empirical work to influence a bond's offering yield will be controlled for to try to isolate the effect of the conversion privilege on the bond's offering yield. This dataset was derived from data originally created by Dr. T. Opler at The Ohio State University and expanded by the authors to include many of the additional explanatory variables. The primary source of the additional information was

# various editions of *Moody's Industrial Manual*.

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Further description of the data, the results of the statistical analysis, and the author's conclusions will be presented at the conference.

## References

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