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An Empirical Investigation into the Performance of High-Yield Bond Issuers

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AN EMPIRICAL INVESTIGATION INTO THE PERFORMANCE OF HIGH-YIELD BOND ISSUERS

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To my family, without their support, none of this would have been possible.

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ABSTRACT

A vast amount of academic research focuses on how bond issuance impacts the firm. Most recent research focuses on investment grade bonds and ignores non-investment grade bonds. Chapter 1 investigates firms issuing high-yield debt and the impact on their stock price by identifying determinants of the negative abnormal return that surrounds the announcement of an issue in the short-run. It is learned the length, coupon payment and amount of the issue are significant in explaining the CAR as is the age of the firm, first-time issuers and the marketplace where its stock trades. Firm performance ratios including the current and total-asset-turnover ratio also have explanatory power. These determinants of the CAR have an explanatory power approaching 55%.

Chapter 2 uses an ordinary least squares technique similar to Chapter 1 to capture determinants of the pricing decision for high-yield bond offerings. I find the coupon amount, the years to maturity, bonds issued for refinancing purposes and callable bonds are significant determinants in the spread at issuance. The exchange in where the firms stock trades and bullish market conditions are also of significance. It is determined these variables have roughly 52% explanatory power over the spread.

Chapter 3 looks at long-run stock underperformance of high-yield bond IBOs' in the 3-5 year post issuing period compared to firms that do not issue stock and\or bonds over the same 5-year post period. A second dataset featuring investment grade bond issuing firms is also compared to firms that do not issue stocks and\or bonds over the same 5-years post period. It is determined that stock underperformance does exist following bond IBOs' using both the Buy-and-Hold return and Fama-French Four-Factor models. The level of underperformance is found to be greatest for callable bonds issuers followed by straight bonds and convertible bond issuers. Additionally, it is learned that high-yield bond issuing firms experience a greater level of underperformance than their investment-grade counterparts. This line of research partially fills the gap in understanding how non-investment grade bonds impacts the firm in both stock performance and the pricing decision.

CHAPTER 1

INTRODUCTION

The intention of this dissertation is to partially fulfill the gap in the existing academic research that exists towards issuers of high-yield bonds. High-yield bonds are a debt instrument issued by firms looking to raise capital that do not have access to traditional capital markets. High-yield bonds have a credit rating of BBB and lower. Firms issuing high-yield bonds offer its investors higher yields to compensate for taking on the additional risk. While the investors into these high-yield bonds are compensated for their assumption of higher risk, the stockholders bear the effects of the increased leverage position of the firm. Capturing how stockholders react to announcements of high-yield bonds and how high-yield bonds are priced to compensate bondholders is the motivation for the dissertation.

It is well published how stockholders react through abnormal returns to firms issuing new investment-grade bonds. Academic research has investigated stockholder reaction through abnormal returns in both the short-run and long-run. Event-study methodology is most frequently used to capture stockholder reaction. Event-study methodology is considered to be an accurate reflection of the abnormal stock returns that surround firm events in the short-run. Common short-run firm events measured include seasoned equity offerings, management changes, merger and acquisition activity and debt issuances.

Accurately measuring long-run abnormal returns has sparked great academic debate, with two different methods for deriving the long-run abnormal stock return coming to the forefront. Both Buy-and-Hold Return methodology and the Fama-French Four Factor model have its proponents as well as its critics. However, these two methods have risen to the forefront to measure a long-run abnormal stock return. Both of these methods have been used to determine long-run abnormal stock returns using firm events such as seasoned equity offerings, stock splits, management changes, new bond issuances and changing regulations over an industry.

The decision how new bond issuances are priced has also been the subject of much academic debate, producing several pricing models. Currently, most of the existing research is focused on the pricing of investment-grade bonds. Research only focusing on investment-grade bonds excludes 1 out of every 7 new bond issuances which accounts for $1/12^{th}$ of the total value of the bond market in the United States. Conducting research where the primary focus is of non-investment grade issues will partially fill the gap in the existing research and provide a better understanding over both stockholder reaction and the pricing decision.

Chapter 2 of the dissertation examines the short-run stockholder reaction that surrounds announcements of high-yield bonds being issued. First, it is determined whether significant cumulative abnormal returns exist surrounding an announcement of high-yield bonds over selected observation windows. These windows include looking at the day of the announcement to one day proceeding to the five days prior and preceding the announcement of an issuance. After the cumulative abnormal return is established at the 95% confidence level, bond and firm characteristic variables are used in a regression framework to partially explain the investor reaction. The bond characteristic variables include; length of the issue, rating of the issue, coupon type, use of proceeds, and whether the issue is callable or non-callable. The firm characteristic variables include; age of the firm at issuance, exchange where the issuing firm's equity trades, various finance ratios of firm performance and the firms' industry classification. One final variable included is used to capture market conditions. I find several variables that reveal significance in explaining stockholder reaction. Just as important, the results of the regression also show what variables are not significant in explaining the abnormal return.

Chapter 3 of the dissertation continues by analyzing the pricing decision for new issuances of high-yield bonds. The spread above the prevailing long-term Treasury rate at issuance is evaluated in this chapter. A better understanding of how high-yield bonds are priced at issuance can be gained by evaluating various bond and firm characteristics and there impact on the spread. Chapter 3 uses the same firm and bond characteristic variables used in chapter 2. In this chapter, the variables are being used to identify any significant determinants of the spread against the prevailing long-term Treasury rate

at the time of issuance. Similar to chapter 2, the test results reveal both significant and non-significant determinants of the spread above the prevailing Treasury rate at issuance. Both Chapters 2 and 3 feature Ordinary Least Squares (OLS) regression techniques in identifying the determinants.

Chapter 4 attempts to identify the determinants of long-run abnormal stock returns using the announcement of a high-yield bond as the triggering event for high-yield initial bond offerings. I assess both investment and non-investment grade bonds in the chapter to determine whether the stock of a high-yield bond issuing firm underperforms the stock of their investment-grade bond issuing counterparts. In addition to being classified as investment or non-investment grade, I categorize bonds as callable, convertible or straight. Identifying underperformance is done through the use of Buy-and-Hold Returns methodology and the Fama-French Four Factor model. The Buy-and Hold method features matching event firms to a match firm that does not issue debt or equity over the estimation window. The Fama-French Four-Factor model uses references portfolios and economic variables to capture any abnormal return. The economic variables used in the Fama-French Four Factor model include; market premium, size of the firm, the firm's book-to-market value and a momentum factor. While both methods vary drastically, the end results reveal the same relationships using either method.

CHAPTER 2

INVESTOR REACTION TO NEW ISSUANCES OF HIGH-YIELD DEBT

2.1 Introduction

Non-investment grade debt is an important financing option for many firms that do not have access to traditional capital. This includes equity offerings and debt instruments such as bank loans or investment grade bond. While investors enjoy higher returns on HYD, the risk of default is also higher. During the period of 1997 – 2002, nearly $174 billion of new HYD was issued. This accounts for nearly 1/7th of all new bond issuances in the United States[1]. During the period of 1992-2001, the average return on high-yield bonds issued with a maturity of 10 years and a rating of B was 9%-11%. Its AAA-rated counter part of investment grade quality yielded a 6% return on average. This higher return does not come without added risk of default. Over the same period, Moody's Investor Services reports that 1.45% of all bonds issued during that period have defaulted; with 4.29% of all HYD issued entered into default, while only 0.03% of investment grade bonds defaulted. In general, the lower the rating of the bond, the higher the potential for default.

The HYD market was born in the early 1980s to supply small and mid-sized firms that demanded capital. The capital was used for acquisition, growth opportunities, and general spending when the firms' balance sheets would not support traditional financing. Drexel Burnham Lambert (DBL) sought out these firms and created a new debt instrument in the non-investment grade bond. Issuers of this new type of investment included the communications and gaming sectors that experienced insurmountable growth in the early 1980s. Early investors (pre DBL) in the non-investment grade market primarily invested in bonds that had fallen from investment grade status to non-investment grade. New issuers of HYD looked to the private placement market to secure financing. In the mid 1980s, DBL began issuing bonds with a credit

[1] Private issues of debt are excluded from this estimate. Bond statistical information (pages 4-6) is from The Bond Market Association publication, "An Investors Guide to High-Yield Bonds" 2000.

rating below investment grade. Major investors in the market included insurance companies, saving and loan associations, and later, mutual funds. Since the mid 1980s, the high-yield marketplace has been comprised of both firms whose debt fell below investment grade and firms not capable of issuing debt at investment grade.

Acquisitions funded with debt or leveraged buyouts (LBO's) using HYD emerged in the mid 1980s. Nearly 1/3 of HYD IBOs (initial bond offerings) in 1985 were issued for LBO's or other acquisition purposes. By 1989, this ratio increased to nearly 65%. The investment community became concerned with firms issuing HYD for acquisition purposes. The investment community had increased their risk and possible unnecessary exposure to the firms in which they held bonds. Along with increased risk came compensation, and this meant higher anticipated returns. Successful LBO's provided higher rates of return for high-yield bonds compared to other investment opportunities. The acquiring firms quickly streamlined operations after an LBO by rapidly paying down debt with the free cash flow generated by increased sales. This led to better financial performance which increased the market price of the debt. However, many of the LBO HYD offerings never reached maturity. After the successful completion of the buyout, many firms would restructure and refinance their capital structure with a new issuance of equity and retire debt from the proceeds at a premium to the investors liking.

Firm growth and LBO's were the main forces driving the infant HYD market along with distress relief. Many firms experienced financial troubles in the 1980s and sought financing in the non-investment grade market when their financial obligations could not be met. These firms issued HYD to pay existing financial obligations in an attempt to ward off a financial distress event. HYD instruments generally have less restrictive covenants than traditional bank debt. Managers were issuing the new debt to pay off bank loans that restricted firm activities. This opened the door for management to partake in new projects that bank loans would not allow due to the distressed position of the firm, and the conditions set forth in the newly retired bank loans.

The late 1980s brought a stalled economy, a federal investigation into DBL, and an increased leverage into the LBO's that were issued earlier in the decade. The Bond Market Association reports the default rate of HYD peaked in 1990 and 1991 at 7.9% and 9.3%, respectively. With a tightening marketplace and a lack of liquidity, the average price of HYD was issued at 65.9% of face value for 1990. By the end of 1991, this downward trend had run full course with the average price of issuance reaching 80% plus of face value. The HYD market also posted impressive returns in 1991 and 1992 of 44% and 17%, respectively. This sparked new interest into the speculative grade market with insurance companies, mutual funds, and pension funds actively adding HYD to their portfolios. Along with this renewed interest, new issuances began to grow. $40 billion worth of new issuances entered the market in 1992, with 1997 being the peak year for issuances with $135 billion. The underwriting community also played a large role in this trend. In the late 1980s, DBL controlled 60% of this market. After the demise of DBL in 1990, traditional underwriters began to offer non-investment grade IBOs. By 1997, this market had 11 major underwriters offering IBOs, each with less than a 12% market share.

The issuing trends in the 1990s were two-fold. In the early 1990s, firms were refinancing outstanding coupon debt issued at high rates for lower rates. By the mid 1990s, this trend had slowed and changes in technology and the telecommunications sector became the driving force for new issuances. The telecommunications sector went through a major revolution in the 1990s with advances in technology and deregulation. Technological advances in computers fueled the Internet and the birth of the electronic media; while deregulation allowed media outlets to own more broadcasting entities than previously allowed. The technology sector demanded an extraordinary amount of capital to keep up with technological advances. At the same time, massive consolidation was triggered in the telecommunications sector. The first five years of the 21st century have continued on the path of the mid to late 1990s with technology firms driving new issuances. However, there has been a return of firms issuing non-investment grade debt for LBO's and other acquisition activity.

High-yield bonds in many cases offer greater yields to compensate for the significant increase in credit risk. Some investors place these types of bonds in their portfolio because of the higher rate of

income generation from the higher coupon payments. Bonds of this type offer the potential for capital appreciation if the borrower's debt rating is upgraded due to improved earnings, mergers or acquisitions, positive industry developments, etc. Gilson and Warner (1998) use event study methodology in an attempt to capture investor reaction to bond issuances by analyzing abnormal stock returns around announcements of HYD. Using a database of 164 stocks, they find a mean cumulative abnormal return (CAR) of -0.8% for both the (-1,1) and the (0,+1) event date windows. While providing evidence stockholders foresee issuances as a negative event, they provide minimal justification for the negative abnormal returns by regressing selected firm specific variables and events against the abnormal return.

In this chapter, I extend the current research by examining abnormal returns that surround an issuance of HYD, and identify firm specific variables and events that are determinants in explaining negative reactions to new issuances of HYD. The intention of this chapter is to investigate into the world of high-yield bonds by analyzing investor reaction to new issuances of HYD. Section 2 is the literature review over abnormal returns and investor reaction to announcements of HYD. Section 3 looks at the short run determinants of a CAR, while Section 4 employs a variety of testing methods to determine if a significant abnormal return exists and what contributes to the investor reaction. Section 5 summarizes the research.

2.2 Literature Review

The existing literature provides evidence that a link between the use of HYD and financial distress exists. Research by Dahiya, Saunders, Srinivasan (2003), Altman (2000), Boughton (2000), Asquith, Gertner and Scharfstein (1994) and Giammarino (1989) show the validity of this link between high-yield bonds and bankruptcy issues. Gilson and Warner (1998) shows that stockholders will react negatively to new issuances of HYD. Furthermore, they believe issuances of HYD may be initiated by instances other than a distress event. Gilson and Warner (1998) also provide results of cross-sectional testing in an attempt to explain why significant CARs are plausible for reasons other than financial distress. Regressed against the CARs are variables emphasizing flexibility, implicit information, and agency costs within the issuing firms. Two variables were employed to capture flexibility that included post-issue % sales growth and a variable to determine if the firm's pre-interest coverage ratio is above or below the sample mean. Following the work of Healy and Palepu (1994) Value Line earnings forecasts were used to capture any bad news relative to future firm performance. Variables representing agency costs include the level of inside ownership within the firm and the use of the proceeds generated by the issuance. The use of proceeds variable is used to capture whether the issuance was allotted to the repayment of debt or used to finance investment in working capital or real assets.

The results of Gilson and Warner (1998) reveal that bank debt reduces flexibility and keeps firms from pursuing profitable growth opportunities. The announcement of a HYD issue can convey a bad news event by management, which can spark a decline in earnings. Increases in agency costs now happen after the issue since managers now have the flexibility to pursue less profitable (or negative present value) projects that will not maximize the value of the firm. Just as importantly, variables representing wealth transfers, financial distress, maturity and underwriter and time effects were shown to have no significance for determining why stock prices decline around firms' announcing new issuances. The chapter concludes citing that financial flexibility is a key motivating factor driving new issuances of HYD.

Attempts to explain abnormal stock returns have taken a few different avenues. Fama and French (1996) use a three factor model to explain abnormal returns that includes regressing firm specific variables such as firm size and book to market ratio. Jensen, Johnson and Mercer (1998) provide arguments that the abnormal returns are influenced by monetary policy and vary significantly over time. Furthermore, it is shown in this test that when using macroeconomic factors, the three-factor model proposed by Fama and French (1996) will not provide adequate results. Hahn, O'Neill and Reyes (2004) study stock return anomalies by examining small firms and value stocks. They use a model created by Eckbo, Masulis and Norli (2000) that eliminates abnormal returns once differences are adjusted for various measures of systematic risk. The model used by Eckbo et al. (2000) captures firms' sensitivity to short and long-term interest rates, patterns of consumption and inflation, and find after accounting for these factors, stock returns to new issuances of equity appear normal.

Hahn et al. (2004) attempts to explain the abnormal return through a regression model regressing a measure of default risk, difference in the Treasury return over the past 20 years, change in real per capita consumption of consumer goods, unanticipated inflation, and the return of the market against the abnormal return. They find that macroeconomic variables can resolve the return differential between large and small firms while the abnormal return used in investment strategies (long position in low market value stocks and short position in high market value stocks) is not significant when accounting for macroeconomic risk factors. They also reveal that the market does not consider exposure to changes in short term interest rates a relevant risk for small firms. When assessing value versus growth stocks, they find evidence that the book to market ratio, cash flow to price and dividend yields were significant in determining the abnormal return for growth stocks but fails to have any explanatory power for value stock firms[2].

Fama, French, Jensen and Roll (1969) pioneered studies using event-study methodology which features market model prediction errors for hypothesis testing. The market model used is:

[2] The test also reveals that abnormal returns appear to be contained to a few decades and do not continue throughout time.

$$R_{it} = \alpha_i + \mathrm{B}_i R_{mt} + u_{it,} \qquad i = 1,.....,n, \quad t = 1,.....,T, \tag{1}$$

Where R_{it} = return on a security *i* for period *t* and R_{mt} = the return on the market portfolio for the period *t.*

Jain (1982) shows applying the assumption that the joint distribution of security returns will be multivariate normal, the joint distribution of the return for any security (R_i) as well as the return on the market portfolio (R_m) will be bivariate normal. This allows Equation 1 to be a valid representation for the returns on security *i*. The coefficients α_i and β_i are mostly estimated using an ordinary least squares technique which determines the prediction error over the period of evaluation. These prediction errors (u_{it}) are precisely the abnormal return shown by:

$$u_{it} = R_{it} - \alpha_i - \beta_i R_{mt}, \quad t > \mathrm{T}, \quad i = 1,\ldots\ldots n. \tag{2}$$

Where R_{it} = return on a security *i* for period *t* and R_{mt} = the return on the market portfolio for the period *t.*

Leftwich (1981), Collins, Rozeff and Dhaliwal (1981) and Holthausen (1981) all developed models that examine abnormal returns using cross-sectional variables. Regressing cross sectional variables against the abnormal return will reveal the characteristics that have an influence upon the abnormal return for a given event.[3] The general form of this model is represented by:

$$u_i = f(firm - sprecific - \mathrm{var}\, iables)_i + w_i, \quad i = 1,\ldots\ldots,n. \tag{3}$$

where w_i is the disturbance term

Models of this type are prevalent in academic literature. The most common application of event-study methodology is measuring the impact of an event and how investor's react by changes in equity prices in

[3] Event studies have generally focused on events such as new issuance of equity, stock splits, divestures, changes in capital structure and any public information that may impact security prices.

both the short and long-run. Ritter (1995) and Loughran (1993) both show that firms engaging in initial public offerings will significantly underperform firms that do not issue for a period up to 5 years. Brav, Geczy and Gompers (2000), Eckbo et al. (2000), Mitchell and Stafford (2000) and Spiess and Affleck-Graves (1995) find significant underperformance surrounding seasoned equity offerings. Spiess and Affleck-Graves (1999) find the underperformance can exceed 30% over a 5-year period in comparison to a firm that does not have a secondary equity issue. Lee and Loughran (1998) evaluate rights offerings and find little evidence of post-offering underperformance. Ikenberry et al. (1995) find significant abnormal returns of 12% exist in the four-year period immediately following stock repurchases.

Research using event-study methodology has also been prevalent in the debt markets. Mikkelson and Partch (1986), Eckbo (1986) and Dann and Mikkelson (1984) find that firms issuing straight debt[4] experience insignificant negative returns at the announcement of debt offerings and conclude firms issuing straight debt have no impact on shareholder wealth. Consequently, Spiess and Affleck-Graves (1999) find substantial long-run underperformance by firms that issue straight debt and find the underperformance is more severe for firms that are small, young and whose equity trades on the NASDAQ markets. Eckbo et al. (2000), Spiess and Affleck-Graves (1999) and Lee and Loughran (1998) show significantly negative stock price reaction surrounds an issuance of convertible debt.

Gilson and Warner (1998) apply event-study methodology to firms' issuing HYD and find stockholders also react to these issuances with negative CARs. They assess investor reactions through the use of event study methodology in an attempt to capture abnormal stock returns around announcements of HYD issues. Using a database of 164 firms, they find a mean CAR for the issuing firms stock to be -0.8% for both the (-1,1) and the (0,+1) event date windows. Furthermore, they show that firms issuing HYD for the first time experience a mean CAR of -0.11% for both the (-1,1) and the (0,+1) event windows. The sample revealed nearly 63% of the issuing firms had negative CARs around the announcement of HYD and 130 of the 164 firms in the sample were first time issuers of this type of debt instrument.

[4] Straight debt is essentially a loan written at a specific interest rate, which is to be repaid over a set number of months.

Gilson and Warner (1998) use event-study methodology to find statistically negative abnormal returns in the short-run surrounding an announcement of a HYD issuance. However, their database is related to subsequent bank loan rating changes and analyzes 164 firms. Current academic research has also identified a variety of uses for event-study methodology with little attention directed at cross-sectional studies in attempts to understand why stockholders react in the manner they do. Given the limitations in the database with respect to size and qualifying observations, I hypothesize that using a database encompassing a larger number of issues without restricting the database to firms with changes in bank debt rating will provide a more accurate assessment of investor reaction to the firms' announcement of issuing new HYD.

Jain (1984) provides the foundation to conduct tests for firm specific variables explaining abnormal returns. Gilson and Warner (1998) also complete cross-sectional tests in an attempt to identify any variables that may influence the abnormal return. They find variables associated with a firm's flexibility have statistical significance while variables measuring wealth transfers, financial distress, maturity, underwriter and time effects were shown to have no significance.

It is here the limitations of the previous work exist. By using a database with a larger number of issuances and without restrictions tied to changes in bank loan ratings, a cross-sectional analysis can be completed using a database of firm-specific and bond characteristic variables regressed against the abnormal return.[5] Testing of this nature will present evidence why stockholders react through abnormal stock returns which surround the announcement of a HYD issuance. After identifying any abnormal returns surrounding issuances of HYD, a cross-sectional analysis will be completed using bond and firm specific variables so it can be learned if the variables tested explain the abnormal returns surrounding an announcement of HYD.

[5] Firm specific variables focusing on changes in Liquidity, Asset Management, Debt Management, and Profitability.

2.3 Data and Methodology

The data used in this chapter comes from several sources. New issuances of HYD issued during the period 1985-2003 will come from the SDC database. Other data unique to each observation taken from the SDC database includes: the marketplace in which the firms' equity is traded, issue date, issue amount, coupon amount, use of proceeds, callability, years to maturity, and the credit rating of the issue. The sample includes 4,217 issuances of HYD by public firms. I omitted 1,434 observations from the dataset for not having complete information over the variables identified; this leaves 2,783 issuances of HYD to be observed. Following Jain (1984)[6] and Gilson and Warner (1998)[7], I next seek out firm specific variables to complete a series of cross-sectional regressions to explain the abnormal return. Financial statements from Compustat are used to understand a firm's financial position at a given point in time, and can be used as a predictor of future earnings and dividends. It is along these lines that I have selected firm specific ratios to explain the abnormal returns surrounding an issuance of HYD. I have selected ratios of liquidity, asset management, debt management and profitability to complete this series cross sectional analysis. The Compustat database was used to match 2,783 observations with full information in the SDC database in complete information with respect to financial variables. After eliminating observations in the database for incomplete information, the end result netted 700 observations. Figure 1 shows the origin of the data, a brief description of the variables selected including any dummy variable classifications used in the testing.

I will start by assessing the database of 2,783 firms with complete information from the SDC database, and complete a series of event studies to capture any CARs surrounding the issuance of HYD. I will test CARs in the short run to capture reaction to the announcement by starting with a one-day event window surrounding the announcement to an 11-day event window. Abnormal returns follow a single factor market model featuring ordinary least squares while using a portfolio standard deviation method

[6] Jain (1984) uses market value of equity and debt to equity ratio to explain abnormal returns.
[7] Gilson and Warner (1998) use variables of flexibility, implicit information and agency costs to abnormal returns surrounding issues of HYD.

Figure 1 - Variable Used and Data Sources

Figure 1 shows the data used and provides a brief description of the data and list the source of the data.

Title	Description	Data Source
Bond Specific		
S&P rating	Dummy variables: BBB, BB, B, CCC	SDC
Exchange	Dummy variables: NYSE, NASDAQ, AMEX	SDC
Use of Proceeds	Dummy variables: acquisition, general purpose, pmt on borrowings	SDC
	refinancing activity	SDC
Coupon Amount	Dummy variables: Fixed Coupon Amount, Floating, Variable	SDC
Callable	Dummy variables: callable bond	SDC
Yrs to Maturity	number of years til bond matures	SDC
Amount of Issue	amount of each individual issues	SDC
High-Yield Bond IBO	Dummy variable: First Time Issuer	SDC
Company Specific		
PERMNO	company identification variable	CRSP
Age at Issuance	age of firm at announcement date	CRSP
SIC Code	firm industry classification	CRSP
Total Current Assets	earned the year of the issuance ($millions)	Compustat
Total Assets	earned the year of the issuance ($millions)	Compustat
Tot Current Liabilities	earned the year of the issuance ($millions)	Compustat
Total Liabilities	earned the year of the issuance ($millions)	Compustat
EBIT	earned the year of the issuance ($millions)	Compustat
Sales	earned the year of the issuance ($millions)	Compustat
Market Specific		
Market Conditions	Dummy Variable: Bull or Bear Market	Compustat

across the sample. The general form of the equation measuring the return is:

$$R_{jt} = \alpha_j + B_j R_{mt} + \varepsilon_t \tag{4}$$

where R_{jt} = return of stock j, α_j = the intercept, B_j = Beta of stock j, R_{mt} = return of the market, ε_t = the error term

with the error term having an expected value of zero and uncorrelated with the market return variable. The return of the individual stock and the market return are used to calculate the abnormal return as shown in Equation 5:

$$AR_{jt} = R_{jt} - (\hat{\alpha}_j + \overset{j}{\beta}_j R_{mt}) \quad (5)$$

the coefficients $\hat{\alpha}_j$ and $\hat{\beta}_j$ are ordinary least squares estimates of α_j and β_j

The CAR is then derivated by individual abnormal return for each trading day over the specified event windows and is shown in Equation 6:

$$CAR_{jt} = \sum_{-t}^{t} AR_{jt} \quad (6)$$

where the CAR_{jt} is calculated over each observation window *t* for each firm *j*

Significant abnormal returns are captured using a z-score that indicate how the CAR deviates from the mean the distribution. After capturing the significant CARs, cross sectional tests through ordinary least squares regression are completed in order to determine whether bond and/or firm specific variables are a significant determinant to acquiring abnormal returns. Following Gilson and Warner (1998), I will test bond characteristics including rating of the bond, market where traded, and use of proceeds. The dependent variable in the regression will be the CAR. The independent variables will be the characteristics of the bond identified in Figure 1. While similar tests were conducted by Gilson and Warner (1998), their database included only 164 firms and the last observations were from 1994. The contribution of the research is to identify whether bond and/or firm specific variables are significant in determining a CAR. Gilson and Warner (1998) only evaluate firms that have corresponding changes in bank loan ratings within 6-months of a new issuance. The following bond characteristics will be evaluated in the regression:

- Rating – The regression analysis features the Standard and Poor's (S&P) rating over the Moody's rating in the analysis. However, both provide virtually the same end results. The rating agencies are given the responsibility of providing a rating for a new issuance in correlation to the risk of the bond. A bond with a high rating is expected to have a relatively lower stock price CAR in comparison to a bond with a low rating. The bonds used in this chapter are of S&P ratings BBB, BB and B and CCC. Bonds with a rating of "CC" or lower were not evaluated due incomplete information in the databases selected. I categorize each bond rating classification into dummy variables, grouping at the respective rating letter, but ignoring pluses and minuses.[8] In general, high-yield bonds at issuance are expected to compensate bond investors with higher risk premiums for bonds of lower credit rating. Stockholders will react negatively, given the additional risk added introduced into the capital structure, causing a negative abnormal stock return. I expect to find a positive coefficient value as a result of the regression. This will cause the negative CAR to become less negative. I also expect to find the lower the rating at issuance, the more negative the CAR given the higher level of risk taken on by the investor associated with each worsening rating category. Bonds of BBB rating are expected to have a less negative impact on the CAR than bonds rated BB and so forth through the bonds being evaluated. I hypothesize the better rating, the less negative the CAR will be. *Impact: positive variable, positive coefficient. This will reduce the amount of the negative CAR.*

- Exchange – The primary exchange in which the bond issuing firm participates is selected for classification. The three markets used are the American Stock Exchange (AMEX), the NASDAQ exchange and the New York Stock Exchange (NYSE). Prior academic research has shown that older and more established companies participate in the AMEX and NYSE exchanges while newer and more technology based companies participate in the NASDAQ market. Gilson and Warner (1995) show that issuing firms that participate in the NASDAQ exchange experience higher costs of issuance. I categorize each market into dummy variables in the regression to capture whether the marketplace where the issuer's equity trades is a factor over the CARs of the issue. I expect to see a positive impact on the CAR

[8] The dummy variable categories for all variables categorized as dummy variables are featured in Figure 1.

of the issue by the exchange variable. I also expect to find firms whose equity trades in the NYSE and AMEX markets to experience a more positive investor reaction than NASDAQ firms given the NYSE and AMEX markets are generally comprised of more established firms. Investors adding HYD to their portfolios purchase this type of security with the anticipation that the firm will perform at or above industry norms. A firm performing below industry level, in a competitive market, will not have the desired profitability level which will reflect in poor performance of it outstanding equity. Firms performing above their industry standard should create renewed interest in the outstanding equity by the investment community and will reflect such in their equity prices in the marketplace. I believe the pricing decision will reflect the liquidity of the firm's other debt and equity offerings and the pricing decision is partly based on this rationale. I hypothesize the better the exchange, the less negative the CAR will be. *Impact: positive variable, positive coefficient. This will reduce the amount of the negative CAR.*

- Use of Proceeds – Tests whether the use of proceeds regressed on the CAR impacts the market reaction of the bond are completed. Gilson and Warner (1998) show the intended use of proceeds by floating a new issue of HYD has an impact on the abnormal return of the issue. Companies are required at the time of registration of a new issue to report to the Securities and Exchange Commission the intended use of proceeds from the issue. I categorize each bond rating classification into dummy variables grouping at the respective use of proceeds as reported by the issuing firm. These classifications include acquisition, general purposes, payments on borrowings, refinancing and other uses. Of these classifications, only the first four classifications will have results as the other uses classification will be lost in the regression. I believe this variable will have a mixed effect on the CAR. I expect to find a positive coefficient value in the regression results for firms issuing HYD for acquisition and general purposes. This will lower the negative CAR. Debt issued for acquisition implies capital is being issued for firm expansion and growth. Debt issued for general purposes does not clearly express its intended use although it does not send a negative signal to the investment community. Consequently, I expect to find firms issuing HYD for payments on borrowings and refinancing activities to have a negative coefficient value from the regression. This will cause the negative CAR to become more negative. Debt issued to repay previous debts can represent a negative signal by the firm to the marketplace. Historically, firm

issuing HYD to pay off other bank-loans and other outstanding bonds is foreseen as a preventative measure to ward off financial distress. Investors should be more willing to purchase equity in firms who raise capital for expansion and new projects in comparison to firms that are facing a distressed position and issue HYD to solve internal capital problems. I hypothesize the more debt issued for mergers and acquisitions and general purposes rather than repayments and refinancing, the less negative the CAR will be. *Impact: (Debt issued for Acquisition and General Purposes) positive variable, positive coefficient. This will reduce the amount of the negative CAR. Impact: (Debt issued for Payments on Borrowings and Refinancing) positive variable, negative coefficient. This will increase the amount of the negative CAR.*

- Coupon Amount – Similar to their investment grade counterparts, HYD issues generally offer an investor coupon payments. These coupon payments are listed at the time of issuance, stated in a fixed value, or can be floating or variable. With floating rate bonds the coupon rate changes are benchmarked on short-term interest rates and can change multiple times per year. Variable rate coupon bonds use long-term interest rates or long-term treasuries as its benchmark for the variable rate and can only adjust once per year. Each coupon type is categorized as a dummy variable in the regression analysis. While it is widely shown in academic research bond investors require higher yield for assuming more risk, the role of the coupon payment with respect to high-yield bonds has been overlooked. The anticipated the sign of the coefficient generated from the regression is negative. This will cause the negative CAR to become more negative. High-yield bonds offer higher coupon payments to their investors compared to their investment grade counterparts. This excess coupon amount paid by issuing firms to lure investors to invest in bonds of higher risk will put excess burden on the financial performance of the firm by having to pay higher interest payments. I hypothesize bonds with a fixed coupon payment will less of an impact over the CAR than a floating or variable coupon payment. The return to the investor is a consistent amount over the life of the bond for a fixed rate coupon, where it is not when the issue is written with a floating or variable coupon amount. I also hypothesize the lower the coupon rate, the less negative the CAR will be. *Impact: positive variable, negative coefficient. This will increase the amount of the negative CAR.*

- Callable – Lee and Loughran (1997) and Fridson and Garman (1998) showed that the callability of a bond, or to retire the bond before its maturity date, adds values to the issue. The issuer can benefit from changes in the economic climate and take advantage of improved interest rate conditions by calling in existing bonds and reissuing new bonds at a lower rate. Similarly, a company may improve its credit standing which qualifies the firm to issue a higher rated bond, which can reduce its interest payments, therefore calling bonds of higher yields. A dummy variable is used to differentiate callable from non-call issues in the database.[9] I expect to find bonds that are callable will produce a positive sign in the regression equation. This is attributed to the likeliness of the issue being called and the simultaneous risk-decreasing event of holding the asset when it is called. I hypothesize that callable bonds will have a less negative CAR than non-callable bonds. *Impact: positive variable, positive coefficient. This will reduce the amount of the negative CAR.*

- Years to Maturity – The years to which the bond matures is being evaluated in order to gain a general understanding whether stockholders react more negatively to bond issued for longer horizons than shorter horizons. Bonds with a longer maturity horizon have a larger risk of default than bonds with a shorter maturity horizon. While the purchaser of the bond is being compensated with a greater default risk premium, stockholders are bearing the additional risk. This should cause the price of the stock to decrease as stockholders will recognize the firm having additional debt obligations. Even in cases where the firm is issuing a high-yield bond for refinancing purposes, in most cases either the interest payments are increased of the term of the debt structure is lengthened or both. It is this rationale that is being tested by categorizing the years to maturity of the issuance into segments using dummy variables to capture if this relationship holds true in the high-yield marketplace. I expect to find that years to maturity will have a negative impact on the CARs at issuance, i.e. the longer the years to maturity of an issue, the more impact on the CAR. I hypothesize that the shorter the term to maturity, the less negative the CAR will be. *Impact: positive variable, negative coefficient. This will increase the amount of the negative CAR.*

[9] Non-callable bonds take on a value of zero while callable bonds are assigned a value of 1 in defining the dummy variables.

- Issue Amount – The amount of the issue creates a direct impact on the capital structure of the firm. The smaller the issue, the less of an impact or unbalance of the firms' existing capital structure. Firms offering additional debt may run the risk of deviating from the industry norm capital structure and therefore limit their ability to compete in a competitive marketplace for their goods and services. I employ dummy variables in the regression to assess the impact of the issue size. I expect to find the higher the issue amount, the greater the negative reaction to the CAR. Given this rationale, I expect to find a negative sign in the regression equation from the impact of the issue amount and the effect it will have on the firms' capital structure. Stockholders will react through higher abnormal returns given higher issue amounts with respect to how the issue impacts the firms existing capital structure. I hypothesize the lower the issue amount, the less negative the CAR will be. *Impact: positive variable, negative coefficient. This will increase the amount of the negative CAR.*

- First-Time Issuers – A firm's announcement of an issuance of HYD historically has been viewed as a negative signal from management. Gilson and Warner (1998) show stockholders also react negatively to announcements of a high-yield bond IBO's through negative abnormal returns on the firm's equity. I do not expect to find this relationship holds true given the changing nature for the reason of issuance and declining default rates over time. I use a dummy variable to represent first-time issuers in the regression. I expect to find the coefficient of the variable to be a positive sign in the regression equation therefore lowering the amount of the abnormal return. I hypothesize when the issuer is a first-time issuer of high-yield debt, the less negative the CAR will be. *Impact: positive variable, positive coefficient. This will reduce the amount of the negative CAR.*

- Age at Issuance – The age of the firm at issuance is tested for any significant effects over the CAR. Older, more established firms should present a more stable investment opportunity than younger firms. Firms that are established over the long-term will have better information as to business trends and their respective place within their industry, and the overall marketplace compared to younger firms. Investors also have more historical information to evaluate the firm and better knowledge of firm performance given a longer history of operations for the older firms. I expect to find the age of the firm will

have a positive effect, which in turn will lower the negative CAR. I hypothesize the older the issuing firm, the less negative the CAR will be. *Impact: positive variable, positive coefficient. This will reduce the amount of the negative CAR.*

- Market Conditions - Historically investors prefer equity investments when the stock markets are increasing in value and prefer debt instruments when the market takes a downturn. Fridson and Garman (1998) show HYD has characteristics that resemble an equity security where both are sensitive to market conditions. A positive economic climate will lead to increased corporate profits, rising equity prices and growing cash flows. These three factors will generally decrease default risk, which in turn will create investor demand and spark price appreciation creating a higher return. During recessionary periods, these relationships are the opposite. I use a dummy variable in the regression equation to represent market conditions. Market conditions are categorized by evaluating the closing price of the NYSE and NASDAQ to capture whether a given year provided a gain or loss in value. HYD issuances are categorized by the year of issuance. Following the prior research of Fridson and Garman (1998), I expect to find high-yield bonds issued in years of increasing stock market returns will have a negative coefficient in the regression equation. This will cause the negative CAR to become more negative. I hypothesize firms issuing high-yield debt in increasing stock markets, the less negative the CAR will be. *Impact: positive variable, negative coefficient. This will increase the amount of the negative CAR.*

The regression equation[10] after accounting for the impact of the bond characteristics will look like:

$$\begin{aligned} -abnormal\ return = &\overset{-}{+}a_0 + \overset{+}{a_1}(\overset{+}{rating}) + \overset{+}{a_2}(\overset{+}{exchange}) + \overset{+\backslash -}{a_3}(use\ of\ \overset{+}{proceeds}) \\ &+\overset{-}{a_4}(\overset{+}{coupon}) + \overset{+}{a_5}(\overset{+}{callable}) + \overset{+}{a_6}(years\ to\ \overset{+}{maturity}) + \overset{-}{a_7}(\overset{+}{issue\ amt}) \\ &+\overset{+}{a_8}(1st\ \overset{+}{time\ issuer}) + \overset{+}{a_9}(age\ \overset{+}{of}\ firm) + \overset{-}{a_{10}}(market\ \overset{+}{conditions}) + \overset{+}{w_i} \end{aligned} \quad (7)$$

where α_0 is the intercept and w_i is the disturbance term. The sign above the intercept terms represents the sign of the intercept as a result of the regression. The sign above the variable represents the sign of the variable in the database.

[10] The expected sign of the intercept is represented in the equation. The sign above the variables represents the expected sign of the variable.

The next part of this chapter will cross-sectionally test firms with statistically significant CARs using the firm specific accounting ratios. Jain (1984) tested variables of market value and profitability to explain abnormal returns surrounding issuances of equity. Gilson and Warner (1998) used variables of flexibility, implicit information and agency costs to capture CARs and changes in bank monitoring after an issuance. Both sets of variables used by Jain (1984) and Gilson and Warner (1998) were representative of the year the debt instrument was issued. I will regress the firm specific financial ratios to capture whether firm performance is a determinant of abnormal returns. The intent of this line of testing is to determine whether HYD is being issued by firms of poor or declining performance. Investors and analysts rely on financial ratios to help predict future earnings and dividends. Similarly, these ratios will prove to be useful in determining CARs that surround an issuance. The ratios used will be normalized[11] at the general industry level (1000 SIC code level) to capture any industry effects across the data. Normalization is computed by using the ratio of the firm divided by the ratio of the industry average. The following ratios will be used in the regression equation:

- Ratio of Liquidity - the current ratio will be used to capture the firms' liquid assets, or how easily the assets of the firm can be converted to cash at fair market value. This measures whether a firm can meet its current obligations. The current ratio is calculated by dividing the firms' current assets by its current liabilities. Current assets include cash, marketable securities, accounts receivables, inventories and marketable securities. Current liabilities include accounts payable, maturities of long term debt, accrued income taxes, short-term notes payable, current maturity of long-term debt and various accrued expenses such as wages and salaries due. Firms inherently do not have negative values for their current liabilities nor current assets. This creates a positive value for a firms' current and normalized ratios. Previous literature reveals that firms that issue HYD are cash strapped or have no access to traditional financing methods. I expect to find current assets to be lower and current liabilities to be higher than firms that do not issue HYD. This will lead to the regression equation showing the normalized current ratio having a negative impact which will increase the CAR. I hypothesize the higher the firms' current ratio, the

[11] Normalization will take place by identifying the issuances of HYD by SIC code at the 1000 level. Each ratio in the analysis will be grouped by SIC code then divided by the industry average for the given ratio in the year of the issuance. After normalization, the new ration will be employed in the cross-sectional regressions.

less negative the CAR will be. *Sign of the normalized ratio: positive; Impact: positive variable, positive coefficient. This will decrease the amount of the negative CAR.*

- Ratio of Asset Management – an asset management ratio is selected to capture how effectively management is managing the assets of the firm. Poor asset management proves to be unproductive since excess inventory represents an inefficient investment, albeit with tangible goods, accounting for low or even zero rates of return. The total asset turnover ratio captures how effectively management oversees its assets and is derived by dividing sales by total assets. The sign of the total asset turnover and the normalized total asset turnover ratios is positive since sales and total assets do not have negative values. Firms issuing HYD should be cash strapped in part due to poor asset management. The regression results will show the normalized total assets turnover ratio contributes or increases the negative CAR. I hypothesize the higher the firms' total asset turnover ratio, the less negative the CAR will be. *Sign of the normalized ratio: positive; Impact: positive variable, positive coefficient. This will decrease the amount of the negative CAR.*

- Ratio of Debt Management – a debt management ratio will be used to determine to which extent firms are using debt financing. The debt management ratio is derived by dividing the total debts of the firm by their total assets. Total debt includes both current liabilities and total long-term debt while total assets are a measured by the summation of the firm's current and fixed assets. The expected sign of the normalized ratio is positive, albeit lower than firms that use investment grade debt in its capital structure. I expect to find and higher total liabilities and lower total assets for firms that issue HYD due to the lack of cash for investment opportunities or issuances for operating capital. These are two main reasons a firm will pursue issuances of non-investment grade debt. In addition, HYD is more expensive than investment grade debt and will also have impact on the debt management ratio. An increase in the firms' debt management ratio can prove to have a positive impact or increase the negative CAR. Stockholders may believe the firm has taken on too much debt or dampen the firms' probability of future success. I hypothesize the lower the firms' debt management ratio, the less negative the CAR will be. *Sign of the*

normalized ratio: positive; Impact: positive variable, negative coefficient. This will increase the amount of the negative CAR.

- Ratio of Profitability – a ratio representing profitability or the profit margin will be used to capture the end result of management's policies and decisions. The basic earnings power ratio will be used to capture the profitability of the firm. This ratio is calculated by dividing the firms' EBIT by its total assets. By using EBIT, this will capture the earnings of the firm before the effects of interest and taxes. The expected sign of the normalized ratio is negative because many firms issue HYD issue to ward off a distress event. I expect to find low or even negative EBIT for issuing firms. That will present a negative or a slightly positive basic earning power ratio. I propose this will create a positive impact on the determination of the CAR. Stockholders purchase HYD on the likelihood of future profitability. Investors take into account the potential earnings of the firm and will reflect a sense of optimism that the earnings of the firm are expected to increase after the issuance. However, the effect of the capital infusion to the firm is unknown at the announcement of an issuance; investor optimism will be overshadowed by potential profitability loss, and create a punishing effect on the firms equity. I hypothesize the higher the firms' basic earnings power ratio is, the less negative the CAR will be. *Sign of the normalized ratio (positive ratio): positive; Impact: positive variable, positive coefficient. This will decrease the amount of the negative CAR. Sign of the normalized ratio (negative ratio): negative; Impact: negative variable, positive coefficient. This will increase the amount of the negative CAR.*

This series of cross-sectional regressions feature ordinary least squares regression and will be conducted using the normalized accounting ratios identified above. The dependent variable in the regression will be the CAR, while the independent variables will be the normalized ratios of financial performance. All variables of firm performance are extracted from the Compustat database and are representative of the year the HYD issuance is announced. The cross-sectional regressions feature

ordinary least squares regression using the normalized accounting ratios identified. The regression equation[12] will be:

$$
\begin{aligned}
-abnormal\ return = &\overset{-}{+} a_0 \overset{+}{+} a_1(\overset{+}{rating}) \overset{+}{+} a_2(\overset{+}{exchange}) \overset{+\backslash -}{+} a_3(\overset{+}{use\ of\ proceeds}) \\
&\overset{-}{+} a_4(\overset{+}{coupon}) \overset{+}{+} a_5(\overset{+}{callable}) \overset{+}{+} a_6(\overset{+}{years\ to\ maturity}) \overset{-}{+} a_7(\overset{+}{issue\ amt}) \\
&\overset{+}{+} a_8(\overset{+}{1st\ time\ issuer}) \overset{+}{+} a_9(\overset{+}{age\ of\ firm}) \overset{-}{+} a_{10}(\overset{+}{market\ conditions}) \\
&\overset{-}{+} a_{11}(\overset{+}{ncurrent\ ratio}) \overset{-}{+} a_{12}(ntotal\ asset \overset{+}{turnover\ ratio}) \overset{-}{+} a_{13}(ndebt \overset{+}{ratio}) \\
&\overset{+}{+} a_{14}(nbasic\ earnings \overset{+\backslash -}{power\ ratio}) + w_i
\end{aligned}
\tag{8}
$$

where α_0 is the intercept and w_i is the disturbance term. The sign above the intercept terms represents the sign of the intercept as a result of the regression. The sign above the variable represents the sign of the variable in the database

These cross sectional tests will be performed on a firm by firm basis after taking note whether a significant CAR exists surrounding an announcement of HYD.

The last section of this chapter will include categorizing the bonds by industry classification[13] to capture any industry effects that may be prevalent with issuing debt. The testing process will be identical to the previous section, however, each industry classification will have its own regression and set of results. Current trends in debt issuance reveal that small, young firms and firms that are technology based rely on debt more heavily than older and more established firms. Analysis into this trend will reveal whether various HYD issuers grouped by industry experience more or less CARs and whether bond or firm characteristics are an indicating factor in these trends. Cross-sectional analysis will be conducted in the same manner as the previous section with one exception. The ratios used to measure liquidity, asset management, debt management and profitability will not be normalized due to the issuing firms being categorized at the 1000 SIC code level. The contribution factor is to determine whether one industry has more significant investor reaction to new issuance of HYD, and whether the industry the firm participates in is a contributing factor. I expect to find the coefficient value to be positive given the industry

[12] The expected sign of the intercept is represented in the equation. The sign above the variables represents the expected sign of the variable.
[13] Industry classification will be conducted at the 1000 SIC code level.

classification is assigned at the 1000 level. Any industry effects should be revealed by the value of the intercept. Young and technology based industries should exhibit a lower value intercept having less of a contribution factor than older, more established industries. I hypothesize the older and more established an industry, the less negative the CAR will be. *Impact: positive variable, positive coefficient. This will decrease the amount of the negative CAR.*

The regression equation[14] tested including the firms' industry classification is:

$$\begin{aligned} -abnormal\ return = &+ a_0 + a_1(\overset{+}{rating}) + a_2(\overset{+}{exchange}) + a_3(\overset{+\backslash -}{use\ of\ proceeds}) \\ &+ a_4(\overset{-}{coupon}) + a_5(\overset{+}{callable}) + a_6(\overset{+}{years\ to\ maturity}) + a_7(\overset{-}{issue\ amt}) \\ &+ a_8(\overset{+}{1st\ time\ issuer}) + a_9(\overset{+}{age\ of\ firm}) + a_{10}(\overset{-}{market\ conditions}) \\ &+ a_{11}(\overset{+}{ncurrent\ ratio}) + a_{12}(\overset{-}{ntotal\ asset\ turnover\ ratio}) + a_{13}(\overset{+}{ndebt\ ratio}) \\ &+ a_{14}(\overset{+\backslash -}{nbasic\ earnings\ power\ ratio}) + a_{15}(industry\ classification) + w_i \end{aligned} \tag{9}$$

where α_0 is the intercept and w_i is the disturbance term. The sign above the intercept terms represents the sign of the intercept as a result of the regression. The sign above the variable represents the sign of the variable in the database

[14] The expected sign of the intercept is represented in the equation. The sign above the variables represents the expected sign of the variable.

2.4 Evaluation and Testing

Firms issuing HYD instruments are extremely sensitive to liquidity in the high-yield marketplace. Firms using this type of debt have limited themselves to not having the ability to access the more stable bank financing which in return means they face greater problems when trying to raise capital. HYD issuing firms' performance and investment spending relies greatly on cash flow, the ability to leverage, and other balance sheet factors. This implies they are susceptible to current and future expectations toward business cycles and any changes in monetary policy by the Federal Reserve Board.

Bond issuance data is extracted from the SDC database, then matched with the firms permanent number in the CRSP database and finally cross referenced with firm specific financial information in the Compustat database. The initial database of high-yield issuances between 1985-2003 revealed 4,217 observations. After screening the database for varied bond characteristics[15] the database was downsized to 1,517 observations. The remaining 1,517 issuances were then cross-referenced with the Compustat database to find the various firm performance measures[16] to compute the firm specific performance variables which include an issuing firm's: current ratio, debt management ratio, total assets turnover ratio and the basic earnings power ratio. This left 1,186 observations with complete information. The final criterion for the database is for the firm to have a significant abnormal return over the observation period. Firms revealing a significant negative abnormal return on their equity prices surrounding an announcement of a high-yield issuance at the 95% confidence interval or better numbered 700. This provided the final database to be comprised of 700 issuances of HYD which includes 331 bond IBO's and 369 SBO's (seasoned bond offerings).

[15] Bond characteristics include coupon amount, use of proceeds, callability of the issue, the years to maturity of the issue, the S&P rating of the issue, the exchange the firm participates with its equity, whether the firm has been delisted, the use of the proceeds from the issue, and the industry code

[16] Firm variables extracted were total assets, total current assets, total liabilities, total current liabilities, earnings before interest and taxes (EBIT) and sales.

2.4.1 Sample Characteristics

2.4.1.1 Descriptive statistics

Table 1 reveals the distribution of the database and shows the 700 issuances with complete information have a value of over $120 billion. Table 1 further reveals almost half (58.40%) of the issuances are of firms that participate in the New York Stock Exchange (NYSE) followed by 31.71% of the issuances by NASDAQ participating firms. Less than 10% of the issuances used are from firms that

Table 1
Market Distribution of High-Yield Debt Issues 1985-2003

This table presents the market distribution of the entire sample for the issuing period between 1985-2003. The sample is categorized by the year of the issuance, the number issuances per year, the total amount issued in the bond market and the equity market in which the issuing firm participates.

Year	Number	Total Proceeds	American	NASDAQ	NYSE	Exchange Not Listed
1985	40	$1,809.7	7	13	16	4
1986	67	$3,211.7	7	29	29	2
1987	58	$3,907.4	7	30	19	2
1988	15	$2,250.6	2	4	4	5
1989	26	$2,007.7	5	11	9	1
1990	16	$2,821.3	1	3	12	0
1991	26	$4,444.0	1	3	22	0
1992	80	$12,787.5	2	12	64	2
1993	79	$15,829.6	4	29	45	1
1994	27	$3,451.3	2	8	17	0
1995	46	$8,148.7	7	17	19	3
1996	43	$8,804.2	2	15	25	1
1997	33	$6,169.4	0	14	19	0
1998	40	$10,388.0	0	9	31	0
1999	14	$5,845.0	0	3	11	0
2000	25	$11,261.5	0	10	15	0
2001	27	$8,213.0	1	7	19	0
2002	21	$5,772.5	0	4	17	0
2003	17	$4,947.6	0	1	16	0
Totals	700	$120,070.7	48	222	409	21
% of Issue		(millions)	6.86%	31.71%	58.43%	3.00%

participate in the American Stock Exchange (AMEX) or other domestic markets. Table 2 highlights each issues intended use of proceeds as listed in the SDC Database. The most popular use of newly

generated proceeds were for general purposes (308), closely followed by firms retiring or refinancing bank debt (182), firms retiring or refinancing foreign debt (111). These three areas encompass roughly

Table 2
Distribution of High-Yield Debt Issues by Use of Proceeds

This table presents the market distribution of the entire sample for the issuing period between 1985-2003. The sample is categorized by the specified or intended use of the issuance as reported to the SEC. The sample is highlighted by year of the issuance and the reported use of proceeds.

Year	Acq Financing	General Purposes	Ref Retire Bank Debt	Retire FX Inc Debt	Other*	Total Issue
1985	7	18	10	0	5	40
1986	5	28	19	6	9	67
1987	4	29	9	4	12	58
1988	1	6	6	2	0	15
1989	1	16	7	0	2	26
1990	0	5	6	2	3	16
1991	0	9	7	8	2	26
1992	0	24	32	24	0	80
1993	4	16	24	34	1	79
1994	2	9	12	4	0	27
1995	1	18	16	6	3	43
1996	5	12	11	11	7	46
1997	3	20	7	0	3	33
1998	2	28	4	1	5	40
1999	0	12	2	0	0	14
2000	2	14	4	2	3	25
2001	1	16	4	2	4	27
2002	1	15	1	3	1	21
2003	0	13	1	2	1	17
Totals	39	308	182	111	61	700
% Issues	5.57%	44.00%	26.00%	15.86%	8.71%	
Issue Amt	6,360.4 (millions)	54,446.2 (millions)	28,651.4 (millions)	21,623.3 (millions)	9,989.4 (millions)	121,070.7 (millions)

*Other Includes: Stock Repurchases, Securities Acquisition, Investment in Affiliates, Project Financing, Capital Expenditures, Capital Investment Funds, Working Capital, Capital Acquisition, Investment in Other Companies, Refinancing and Secondary Financing

86% of all issues between 1983-2003. Acquisition purposes listed as the primary reason for issuance is only 39 or 5.57% of the database. The least popular reasons to issue bonds are lumped together as other[17] in the table and represent 8.71% of the issuances.

[17] This group includes stock repurchases, securities acquisition, investment in affiliates, capital expenditures, capital investment funds, working capital, capital acquisition, investment in other companies, general refinancing and secondary financing.

Table 3 features the distribution of the database accounting for the various ratings of the issuances analyzed.[18] Table 3 shows of the 700 issuances that comprises the database, 44.00% or 308 are of single B rating by Standard and Poors. Bonds of BB rating are second most prevalent in the database accounting for 28.00% of the issuances. Bonds of no rating, BBB and CCC complete the database with 12.14%, 11.71% and 4.14% respectively.

Table 3
S&P Rating of the Issuance

This table presents the distribution of the entire sample for the issuing period 1985-2003 identifying the issuances by their Standard & Poor's rating as well as the year of issuance. Panel A represents the number of issues in a given year categorized by the rating of the issue. Value represents the amount of the issuance categorized by aggregate amounts.

Panel A: Number of Issues						
Year	BBB	BB	B	CCC	NR	Total
1985	2	6	23	0	9	40
1986	5	9	31	5	17	67
1987	3	5	29	7	14	58
1988	1	3	6	2	3	15
1989	1	3	14	4	4	26
1990	3	6	7	0	0	16
1991	6	11	8	0	1	26
1992	7	33	33	1	6	80
1993	19	16	40	2	2	79
1994	6	4	16	0	1	27
1995	5	6	28	2	2	43
1996	3	19	21	0	3	46
1997	5	13	11	0	4	33
1998	4	26	7	1	2	40
1999	3	5	2	1	3	14
2000	0	9	5	2	9	25
2001	3	10	10	1	3	27
2002	4	9	7	0	1	21
2003	2	3	10	1	1	17
Total	82	196	308	29	85	700
% of Issue	11.71%	28.00%	44.00%	4.14%	12.14%	
Monetary Value						
Total	$17,896.2	$42,197.5	$49,825.2	$4,259.0	$6,892.8	$121,070.7
% of Issue	14.78%	34.85%	41.15%	3.52%	5.69%	

[18] Bonds of non-investment grade as defined by Standard and Poors are evaluated. Credit grades of BBB, BB, B, and CCC compile the sample. The database also was defined by selecting the Moody's Investor Service rating of the issue, however, the categorization of the bonds fell into the same classification level irrespective of the rating agency.

The monetary distribution of the sample is shown in table 3. This finds the same relationships with respect to proportionality as the number of issues based on rating for the first two most prevalent ratings. Bonds of B rating account for 41.15% of the monetary value and accounts for $49,825.3 million of the sample. Second are bonds with a rating of BB with $42,197.5 million. The monetary distribution differs from the aggregate number of issuances from here. The order if value is bonds of BBB rating followed by non-rated then CCC bonds. This trend reveals while more non-rated bonds are being issued than BBB rated bonds, the average amount of the issue is less for non-rated bonds than BBB bonds.[19] Bonds of BBB have an average amount of $218.246 million compared to non-rated bonds have an average issuance of $81.091 million.

2.4.1.2 Industry level

Table 4 shows the distribution of the sample by highlighting the industry in which the issuing firm is classified. This line of research provides descriptive statistics of the sample firms at the 1000 SIC code level. Appendix A includes a comprehensive list of SIC codes and the industries that participates under a given industry classification. Table 4 lists the distribution of the database from the number of issued high-yield bonds from a given industry classification. Panel A reveals firms of the Manufacturing[20] and the Transportation, Utilities and Sanitary Services issuances respectively over the period 1985 – 2003. The financial services sector (6000 sic code) is the least prevalent in the database only being represented by 6 issuances or 0.86% of the total database. This limited number is attributed to the regulation at the federal and state levels and the differences in the required reporting of financials in this industry categorization. The last part of Table 4 highlights the monetary distribution of the sample with respect to SIC code. The monetary distribution is similar to the number of issuances represented with the manufacturing sector having 32.95% of the monetary value at $39,992.9 million while the Transportation, Utilities and Sanitary Services sector accounts for $35,942.8 million or 29.69% of the value represented in the database. The Financial Services sector again is represented with the lowest monetary value at $856.8 million or 0.71%

[19] Average issue amount is computed by: (# of issues in a given credit rating / total dollar value issued with a given credit rating).
[20] includes both the 2000 and 3000 SIC code issuances

of the total monetary value of the sample. The total monetary value represented in the database is just a bit over $121 billion.

Table 4
SIC Distribution of High-Yield Debt Issuances

This table presents the market distribution of the entire sample for the issuing period between 1985-2003 identifying the issuing firms by their Standard Industry Classification as well as the year of issuance. Panel A represents the number of issues in a given year with respect to the SIC code of the issuing firm. Panel B list the aggregate amount of the issue taking into account the year of issuance and the SIC code.

Panel A: Number of Issues									
SIC	1000	2000	3000	4000	5000	6000	7000	8000	Total Issue
1985	1	7	11	10	3	1	6	1	40
1986	2	9	23	11	7	3	7	5	67
1987	2	14	19	5	10	0	5	3	58
1988	3	2	3	2	3	0	2	0	15
1989	4	2	8	5	4	0	1	2	26
1990	5	7	3	0	1	0	0	0	16
1991	3	4	5	4	8	0	2	0	26
1992	8	13	16	13	20	0	4	6	80
1993	7	6	22	12	14	0	14	4	79
1994	7	2	7	4	3	0	2	2	27
1995	2	5	6	12	8	0	4	6	43
1996	5	3	9	14	4	0	7	4	46
1997	6	2	8	13	3	0	1	0	33
1998	6	1	7	24	0	1	1	0	40
1999	1	2	2	5	2	0	2	0	14
2000	1	3	6	11	0	0	4	0	25
2001	2	6	4	11	1	0	2	3	29
2002	0	0	8	5	4	1	1	0	19
2003	2	1	1	6	3	0	4	0	17
Totals	67	89	168	167	98	6	69	36	700
	9.57%	12.71%	24.00%	23.86%	14.00%	0.86%	9.86%	5.14%	
Monetary Value									
Totals	$10,437.1	$12,450.0	$27,442.9	$35,942.8	$12,821.0	$856.8	$14,431.0	$6,689.1	$121,070.7
	8.62%	10.28%	22.67%	29.69%	10.59%	0.71%	11.92%	5.52%	

2.4.2 Stock Price Impact

The contribution of the research is to capture the investor reaction that surrounds the announcement of an issuance of HYD. Gilson and Warner (1998) capture investor reactions through the use of event study methodology featuring a market model in an attempt to capture abnormal stock returns

around announcements of HYD issues. They use a database of 164 stocks encompassing the NYSE, NASDAQ and the American stock markets. They found a mean CAR of -0.8% for both the (-1,1) and the (0,+1) event date windows. Furthermore they showed that firms issuing HYD for the first time experience a mean CAR of -0.11% for both the (-1,1) and the (0,+1) event windows. It is along these lines that provided the motivation to run event studies to capture the CARs over a database of 700 HYD issuances.

2.4.2.1 General sample – CARs

Table 5 summarizes the results of the event studies over the database as well as accounting for if the firm is a first-time issuer of HYD. It is shown here that roughly half of the issuances in the database are bond IBO's with the other half of the issuances are being issued by firms that have previously issued a high-yield debt. The tests show stockholders negatively react to announcements of HYD in four of the five event windows tested for all bonds in the database.

Table 5
Cumulative Abnormal Returns for High-Yield Bond Issuing Firms
Based on Current Position and Number of High-Yield Issuances

Cumulative abnormal return for high-yield debt issuing firms over the period 1985-2003. Day zero in the observation windows are represented as the day of the announcement for a new issuance of high-yield debt. The sample of high-yield bonds is compiled from the SDC database while the cumulative abnormal return is calculated using the Center for Research in Security Prices (CRSP) database. Announcements of new issuance are categorized by the entire sample, a firms current status as operational or being delisted and whether a firm is issuing its first high-yield debt or has multiple high-yield issues over the observation window.

Event Window	1-day (0,1)	3-day (-1,1)	5-day (-2,2)	7-day (-3,3)	9-day (-4,4)	11-day (-5,5)
All Bonds (n=700)	-0.44%	**-0.75%**	**-0.59%**	**-0.74%**	**-0.87%**	**-0.93%**
	-0.011	*-1.973**	*2.702***	*3.312****	*2.819***	*3.599****
First-Time Issuers (n=331)	**-0.71%**	**-1.06%**	**-1.27%**	**-1.53%**	**-1.86%**	**-1.94%**
	*-3.302****	*-3.760****	*-3.070***	*-2.783***	*-3.195****	*-3.062***
Non-First Time Issuers (n=369)	**-0.20%**	-0.47%	**0.02%**	**-0.03%**	**0.02%**	**-0.01%**
	*3.057***	*0.804*	*6.548****	*7.115****	*6.826****	*7.769****

* significant at .05 ** significant at .01 *** significant at .001

The level of significant reaction varied from -0.75% at the 3-day window to -0.93% at the 11-day window with a significance level of 95% over the three, five, seven, nine and 11 day event windows.[21] The second group of tests in this series evaluates firms that issue HYD for the first time compared to firms that issued multiple times.[22] First-time HYD issuing firms faced sharply more negative reaction than multiple issuers. The event study finds stockholders punish first time issuers in all event windows from a range of –0.71% in the 1-day window to –1.94% in the 11-day window. Multiple time issuing firms also exhibit negative investor reaction but not nearly as severe. Significant reaction at the 95% confidence level varies from –0.01% to –0.20% in the 1,5,7,9 and 11-day windows while the 3 day window finds no significant reaction.

2.4.2.2 Industry CARs

Each issuance of HYD is separated by their respective SIC codes at the 1000-level for analysis to capture industry specific investor reaction to new issuances. Table 6 shows the results of the event studies conducted at the 1000 SIC code level. HYD issued by firms with SIC codes of 1000 and 7000 revealed no significant abnormal returns. Firm activities in the 1000 SIC code includes Mining and Construction, while the 7000 SIC code includes the Services industry.[23] Appendix A provides a complete industry list of each business type and its respective general classification.

The 2000 and 3000 SIC codes represent the manufacturing sector. Table 6 shows 89 firms within the 2000 SIC code and 168 firms within the 3000 SIC code. Firms within the 2000 SIC code had significant investor reactions to new issuances of HYD at the 3,7,9 and 11-day event windows. Negative significant abnormal returns ranging from –1.02% at the 3-day window to –1.76% at the 11-day window were found at the 95% confidence level. The 5-day window had significant abnormal returns at the 90% confidence level. The 3000 SIC code firms revealed negative significant abnormal returns over all windows tested with reaction ranging from -0.06% to –0.54%.

[21] The table lists testing windows in actual days before and after a given announcement of an issuance. For example, the (-1,1) day window represents three trading days, the day before the announcement, the day of the announcement and the day following an announcement.
[22] The SDC database has each observation marked whether the issuance is the first for a particular firm.
[23] The services industry is represented by forms of both 7000 and 8000 SIC codes. While the 7000 SIC code firms revealed no significant abnormal returns, the 8000 SIC code did reveal negative reaction to new issuances. The 7000 SCI code is comprised on consumer service firms while the 8000 SIC code is comprised of social service firms.

The 167 4000 SIC code firms, or those with the Transportation, Communications, Electric, Gas and Sanitary Services classification, exhibited significant abnormal returns over the 3 and 5-day windows with losses of –0.52% and –1.10% respectively. Additionally, the 7 and 9-day windows had abnormal returns significant at the 90% confidence level. The 98 5000 SIC code firms, or those with the Wholesale and Retail Trade classification, have significant abnormal returns in all testing windows except the 5-day window. The level of underperformance over the significant windows ranged form –1.02% at the 3-day

Table 6: Cumulative Abnormal Returns for High-Yield Bond Issuing Firm's Stock Exchange where Firm's Equity Trades

Cumulative abnormal return for high-yield debt issuing firms over the period 1985-2003. Day zero in the observation windows are represented as the day of the announcement for a new issuance of high-yield debt. The sample of high-yield bonds is compiled from the SDC database while the cumulative abnormal return is calculated using the Center for Research in Security Prices (CRSP) database. Announcements of new issues are categorized by the standardized industry code (SIC Code) of the issuing firm.

Event Window	1-day (0,1)	3-day (-1,1)	5-day (-2,2)	7-day (-3,3)	9-day (-4,4)	11-day (-5,5)
SIC Code 1000 (n=67)	0.34% *1.052*	0.35% *1.195*	0.03% *0.567*	0.59% *1.167*	0.17% *0.578*	0.15% *0.17*
2000 (n=69)	-0.42% *-0.978*	**-1.02%** *-2.098**	-0.32% *-1.351*	**-1.21%** *-2.165**	**-1.61%** *-2.023**	**-1.76%** *-1.762**
3000 (n=168)	**-0.37%** *4.742****	**-0.54%** *2.689***	**-0.14%** *10.221****	**-0.33%** *10.714****	**0.08%** *10.151****	**-0.06%** *11.601****
4000 (n=167)	-0.25% *-1.262*	**-0.52%** *-1.787**	**-1.10%** *-2.427***	-0.93% *-1.398*	-1.07% *-1.448*	-0.75% *-1.06*
5000 (n=98)	**-1.02%** *-2.671***	**-1.50%** *-3.230****	-0.62% *-1.151*	**-1.55%** *-1.875**	**-1.95%** *-2.088**	**-2.38%** *-2.426***
6000 (n=6)	**-0.87%** *-2.457***	**-1.47%** *-2.379***	-0.58% *-0.752*	-0.92% *-0.616*	-2.16% *-0.605*	-2.86% *-0.637*
7000 (n=69)	-0.74% *-0.663*	-0.94% *-0.782*	-0.48% *0.099*	-0.08% *0.467*	-0.03% *0.822*	0.16% *1.049*
8000 (n=36)	-0.99% *-1.63*	**-1.64%** *-1.992**	**-2.33%** *-2.387***	**-2.14%** *-1.909**	**-2.97%** *-2.288**	**-3.56%** *-2.517***

* significant at .05 ** significant at .01 *** significant at .001

window to –2.38% at the 11-day window. The 6 6000 SIC code firms, or those with the Finance, Insurance, and Real Estate classification, had 1 and 3-day window negative significant abnormal returns of –0.87% and –1.47%, respectively.

The 69 7000 SIC code firms had no significant abnormal returns. The 36 8000 SIC code firms, or those with Health, Legal, Educational and Social Services classification had a negative investor reaction to new issuances of HYD over all testing windows. The 1-day window does show negative significant abnormal returns but only at the 90% confidence level The remaining test windows (3,5,7,9,11-days) all reveal significant abnormal returns ranging from –1.64% to –3.56%.

The results of the event studies reveal stockholders do react negatively to new issuances of HYD, with the size and significance of the reaction depending on the SIC code classification of the issuances. In general, stockholders react negatively to new issuances of HYD by reducing the returns of the firms' equity surrounding the announcement of an issuance by nearly 1%. The tests further reveal stockholders exhibit a more negative reaction to issuances by firms in the 8000 SIC code (social services) industry than any other industry classification. In contrast, stockholders have no significant reaction to firms issuing HYD in the 1000 (mining and construction) and 7000 (consumer services) SIC classifications. Attempts to explain investor reaction to new issuances of HYD through negative abnormal returns are investigated further.

2.4.3 Regression Results

2.4.3.1 General sample

The first in the series of regressions uses the abnormal return as the dependent variable, and several explanatory variables which include: the coupon type, the amount of the issuance, whether the issuance is callable or not, the years to maturity of the issuance, the rating of the issue as categorized by S&P, the exchange where the equity of the issuer participates, whether the firm is a first time issuer of HYD, the intended use of the proceeds from the issue, and whether the equity market is in a bull or bear

state at the time of issuance. Table 7 shows the results of the regression analysis using the 1, 3,5,7,9 and 11-day event windows surrounding an announcement of a debt issuance.

The regression tests confirm some of the earlier hypothesis by revealing variables that prove to be significant[24] in determining the abnormal return that surrounds an announcement of a HYD issuance. The first regression analysis (Equation 6) reveals that several variables are statistically significant in determining an abnormal return. These include: the length of the issue, the age of the firm, issue amount, the rating of the issue and whether a firm is a first time issuer. While these test variables prove to be significant, the coupon amount, the exchange where the firms equity trades, the use of proceeds, callability of the issue and market conditions do not have a significant impact on the abnormal return surrounding an announcement of a high-yield bond issuance in the event windows tested.

Variables shown to be significant occur in all the event windows tested. In the 1-day window, which evaluates the announcement day as day zero and the first day after the announcement, it is learned that the age of the firm at issuance and bonds rated BBB, BB and CCC are significant in explaining the abnormal return. The 1-day window revealed an R^2 of .5300 with an adjusted R^2 of .5147 or roughly 53% of the variation explained by the regression equation. The 3-day event window with an R^2 of .5117 (adjusted R^2 of .4958) captures the day before the announcement of an issuance, the announcement day and the day prior to the announcement. The age of the firm at issuance and bonds of CCC rating are no longer found to be significant in this window. Bonds of CCC rating are no longer found to have a significant impact over abnormal return for the remaining observation windows. Variables revealing statistical significance in the 3-day window include the length of the issue, and bond with a BBB or BB rating. The 5-day[25] window (R^2 of .4880) has the same relationships as the 3-day window with one inclusion; bonds of a B rating have a statistical significance.

[24] Test of significance are evaluated at the 95% confidence level or above. Variables testing significant are at the 95% confidence level or above.
[25] 5-day window tests the two days before and after the announcement date as well as the announcement date.

Table 7

Regression Relating the Cumulative Abnormal Return Surrounding an Announcement of a High-Yield Debt Issuance to Bond and Firm Specific Characteristics

The ordinary least squares cross-sectional regression of the cumulative abnormal return is tested surrounding the announcement of a high-yield debt issuance ion a variety of test windows that include the announcement date to the first day after the announcement (0,1) to a range of 5 days before and after the announcement (-5,5) or an 11-day window. Coupon amount is a dummy variable that is categorized based on a fixed, floating or variable amount. Amount of Issuance is a variable based on the size of the issue with respect to dollar amount. The Years to maturity classification distinguishes the issuances by the number of years from issuance the bond will mature. The rating of issue takes a dummy variable format and takes into account the issues Standard and Poor's rating. Age of the firm at issuance is analyzed while a dummy variable is used to for callable bonds in nature. The exchange in which the issuing firms equity trades at time of issuance is represented by dummy variables. A dummy variable is used to identify a firm issuing high-yield debt for the first time is of any significance. A dummy variable is used to determine if market conditions has any effect on the cumulative abnormal return. The use of proceeds is represented with dummy variables noting the issuing firms reported use of proceeds form the issue. The numbers in parentheses are the p-values.

Window	1-Day	3-Day	5-Day	7-Day	9-Day	11-Day
Variable						
Intercept	**-0.0652820**	**-0.0782600**	**-0.1056560**	**-0.1171550**	**-0.1320630**	**-0.1533090**
	[.000]	**[.000]**	**[.000]**	**[.000]**	**[.000]**	**[.000]**
Length of Issue						
Years to Maturity	0.0002425	**0.0004094**	**0.0005564**	**0.0008456**	**0.0007945**	**0.0008969**
	[.075]	**[.013]**	**[.024]**	**[.009]**	**[.015]**	**[.019]**
Age						
Firm Age at Issue	**0.0002080**	0.0001873	0.0002362	**0.0005490**	**0.0005599**	**0.0007953**
	[.040]	[.127]	[.199]	**[.025]**	**[.023]**	**[.006]**
Issue Amount						
Amount of Issue	-0.0000092	-0.0000070	-0.0000112	**-0.0000251**	**-0.0000245**	**-0.0000428**
	[.051]	[.221]	[.187]	**[.026]**	**[.031]**	**[.001]**
Coupon Amount						
Fixed Amount	-0.0065076	-0.0096677	-0.0053649	-0.0106010	-0.0070699	-0.0113830
	[.187]	[.105]	[.546]	[.367]	[.550]	[.413]
Floating	-0.0094699	-0.0105110	-0.0060456	-0.0093913	-0.0118030	-0.0094362
	[.109]	[.142]	[.570]	[.504]	[.404]	[.570]
Variable	-0.0083410	**-0.0150710**	-0.0049640	-0.0047975	-0.0108680	-0.0104890
	[.175]	**[.043]**	[.654]	[.744]	[.462]	[.545]
Standard and Poor's' Rating of the Issue						
BBB	**0.0149690**	**0.0143070**	**0.0236370**	**0.0296500**	**0.0322610**	**0.0354130**
	[.000]	**[.001]**	**[.000]**	**[.001]**	**[.000]**	**[.001]**
BB	**0.0094285**	**0.0099188**	**0.0226570**	**0.0309730**	**0.0297990**	**0.0401160**
	[.002]	**[.008]**	**[.000]**	**[.000]**	**[.000]**	**[.000]**
B	0.0028187	0.0061829	**0.0098323**	**0.0182730**	**0.0158310**	**0.0210660**
	[.303]	[.061]	**[.047]**	**[.005]**	**[.016]**	**[.006]**
CCC	**-0.0104870**	-0.0032921	-0.0031507	-0.0015441	-0.0131380	-0.0103980
	[.026]	[.561]	[.709]	[.890]	[.243]	[.432]

Table 7 continued						
Standard and Poor's' Rating of the Issue						
BBB	**0.0149690**	**0.0143070**	**0.0236370**	**0.0296500**	**0.0322610**	**0.0354130**
	[.000]	**[.001]**	**[.000]**	**[.001]**	**[.000]**	**[.001]**
BB	**0.0094285**	**0.0099188**	**0.0226570**	**0.0309730**	**0.0297990**	**0.0401160**
	[.002]	**[.008]**	**[.000]**	**[.000]**	**[.000]**	**[.000]**
B	0.0028187	0.0061829	**0.0098323**	**0.0182730**	**0.0158310**	**0.0210660**
	[.303]	[.061]	**[.047]**	**[.005]**	**[.016]**	**[.006]**
CCC	**-0.0104870**	-0.0032921	-0.0031507	-0.0015441	-0.0131380	-0.0103980
	[.026]	[.561]	[.709]	[.890]	[.243]	[.432]
Exchange where Firms' Equity Trades						
NYSE	0.0091268	0.0018057	0.0047870	0.0111350	0.0067776	0.0101430
	[.117]	[.797]	[.647]	[.422]	[.626]	[.535]
NASDAQ	0.0061875	0.0007552	0.0041780	0.0057923	0.0100300	0.0133370
	[.217]	[.901]	[.644]	[.628]	[.403]	[.344]
AMEX	0.0075849	0.0077587	0.0035747	0.0069582	0.0105440	0.0161000
	[.142]	[.214]	[.700]	[.572]	[.394]	[.268]
Use of Proceeds						
Acquisition	0.0040296	0.0074548	-0.0026539	-0.0148470	-0.0178440	-0.0112350
	[.505]	[.308]	[.807]	[.301]	[.217]	[.508]
General Purposes	0.0004249	0.0050966	-0.0075867	-0.0228560	-0.0227470	-0.0161780
	[.934]	[.413]	[.413]	[.062]	[.065]	[.263]
Payment on Loans	-0.0046747	-0.0029763	-0.0200820	-0.0247510	-0.0226900	0.0076508
	[.556]	[.757]	[.160]	[.191]	[.234]	[.733]
Refinancing	-0.0007455	0.0064487	-0.0050897	-0.0134880	-0.0204580	-0.0117750
	[.885]	[.302]	[.583]	[.272]	[.097]	[.416]
Callability of the Issuance						
CALLLIST	0.0025931	0.0024248	0.0050513	0.0078518	0.0064305	0.0043358
	[.201]	[.319]	[.163]	[.102]	[.184]	[.446]
Market Conditions						
Bull Market	-0.0007138	-0.0009163	-0.0033302	-0.0033259	-0.0051484	-0.0025580
	[.715]	[.698]	[.344]	[.476]	[.272]	[.642]
Number of Issuances						
First-time Issuer	-0.0003586	0.0015593	0.0031734	0.0043725	0.0069142	**0.0109340**
	[.832]	[.446]	[.298]	[.278]	[.088]	**[.022]**
R-squared	0.5300260	0.5117150	0.4880460	0.4319750	0.4452990	0.4245910
Adjusted	0.5147530	0.4958470	0.4714090	0.4135160	0.4272740	0.4058920
observations	700	700	700	700	700	700

Beginning with the 7-day event window (R^2 of .4319) and continuing into the 11-day window (R^2 of .4245), the level of variation explained by the regression equation begins to weaken. However, a few new variables show significance in explaining the abnormal return. The 7-day and the 9-day window reveal the same significant variables. The length of the issue, the age of the firm and the issue amount are found to reveal significance along with bonds of BBB, BB and B ratings. The final observation window, or the 11-day observation period has the same relationships as the 7 and 9-day windows with

one inclusion. First-time issuers show significance in this window, although this is the only incidence of this variable of the event windows tested.

Section 4 provides an explanation of the variables used in the regression and their believed impact over the abnormal return. The results in table 7 are the first in a series of regression results. The regression results show that the years to maturity and the age of the firm at issuance have a positive coefficient value as predicted, with both being statistically significant in determining an abnormal return. The exchange where the firms' equity trades and whether the issue is callable both have a positive coefficient as predicted, but are not statistically significant in determining a CAR. Variables revealing a positive coefficient value when multiplied with a positive valued variable will lower the amount of the CAR. The amount of the issue retains its predicted intercept (negative) in the regression results, and is significant in determining a CAR. The coupon amount and whether the market is in a bull or bear state both have a negative coefficient as predicted, but are not of statistically significant in determining a CAR. Variables revealing a negative coefficient value when multiplied with a positive valued variable will increase the amount of the CAR.

The final variables tested in this regression (Equation 6) have mixed results to their impact on the CAR. The rating of the issue results show bonds of a rating of BBB, BB and B all have a positive coefficient value which will result in a positive impact over the CAR. Bonds of CCC rating have a negative coefficient value. Bonds issued with a CCC rating will increase the negative CAR. The use of proceed variables also reveal mixed results. Bonds issued for acquisition, general purposes and payments on loans have mixed or changing signs throughout the observation windows. Bonds issued for refinancing have the same sign (negative) for its intercept over the observation window. Both of these variable categories are shown to be not significant in determining an abnormal return. The final variable with mixed results identifies first-time issuers. This variable has a negative intercept value in the 1-day window and a positive intercept value over the rest of the sample.

2.4.3.2 Inclusion of firm specific ratios

The next series of regressions includes variables of firm performance. Here it will be answered whether an abnormal return can be partially explained by the financial performance of the firm. It is routine for investors and analysts to rely on financial ratios to help predict future earnings and dividends. This line of testing includes various ratios of financial performance to identify significance in determining CARs that surround an issuance of HYD. Issuing firms' current, total asset turnover, debt and basic earning power ratios are used in this series of regression tests. All ratios are normalized[26] at the general industry level to capture any industry effects across the data. The testing windows used in this series of test are the same in the previous section.

Table 8 reveals the results from the inclusion of firm ratios into the regression analysis (Equation 7) with the same variables used in the previous regression test. It is here the test results show a slightly increased measure of R^2. In the 1,3 and 5-day windows, the R^2 is .5335, .5158 and .4937 respectively compared to .5300, .5117 and .4880 over the same testing windows. This trend continues over the entire series of regressions when comparing them to the previous series of regressions. The 1-day window finds the age of the firm and bonds of BBB, BB and CCC rating to be of significance as found with the earlier results. The length of the issue, the amount of the issue, and a firm's total asset turnover ratios are also shown to be significant when accounting for firm performance in the regression equation. In the 3-day event window, the length of the issue, a variable coupon amount, binds rated BBB and BB and the total asset turnover ration are found to have significance. The 5-day event window has similar results as the 3-day window except in one instance. In this window the total asset turnover ratio loses its significance while the current ratio is proven to be a significant variable. The 7-day and 9-day event windows find the same variables significant in determining a CAR. Variables identifying years to maturity, the age of the firm at issuance, issue amount and bonds rated BBB, BB and B are represented in both sample windows. The 11-day event window has the same relationships as the 7and 9-day windows with one inclusion. The firms issuing a high-yield bond for the first time are found to have significance.

[26] Normalization will take place by identifying the issuances of HYD by SIC code at the 1000 level. Each ratio in the analysis will be grouped by SIC code then divided by the industry average for the given ratio in the year of the issuance. After normalization, the new ratio will be employed in the cross-sectional regressions.

Table 8

Regression Relating the Cumulative Abnormal Return Surrounding an Announcement of a High-Yield Debt Issuance to Bond and Firm Specific Characteristics Including Normalized Ratios of Firm performance

The ordinary least squares cross-sectional regression of the cumulative abnormal return is tested surrounding the announcement of a high-yield debt issuance ion a variety of test windows that include the announcement date to the first day after the announcement (0,1) to a range of 5 days before and after the announcement (-5,5) or an 11-day window. Coupon amount is a dummy variable that is categorized based on a fixed, floating or variable amount. Amount of Issuance is a dummy variable based on the size of the issue with respect to dollar amount. The Years to maturity dummy classification distinguishes the issuances by the number of years from issuance the bond will mature. The rating of issue takes a dummy variable format and takes into account the issues Standard and Poor's rating. Age of the firm at issuance is analyzed while a dummy variable is used to for callable bonds in nature. The exchange in which the issuing firms equity trades at time of issuance is also represented by dummy variables. A dummy variable is used to identify whether a firm issuing high-yield debt for the first time is of any significance. A dummy variable is used to determine whether market condition has any effect on the cumulative abnormal return. The use of proceeds is represented with dummy variables noting the issuing firms reported use of proceeds from the issue. Normalized ratios of firm performance are used to capture if firm performance is a determinant of a cumulative abnormal return while the normalization of the variable will remove any industry effects. The number in parentheses are the p-values.

Window	1-Day	3-Day	5-Day	7-Day	9-Day	11-Day
Variable						
Intercept	**-0.0634210**	**-0.0797810**	**-0.0954420**	**-0.1057420**	**-0.1279460**	**-0.1399700**
	[.000]	**[.000]**	**[.000]**	**[.000]**	**[.000]**	**[.000]**
Length of Issue						
Years to Maturity	**0.0002959**	**0.0004741**	**0.0005192**	**0.0007570**	**0.0007318**	**0.0008078**
	[.032]	**[.005]**	**[.037]**	**[.022]**	**[.028]**	**[.038]**
Age						
Firm Age at Issue	**0.0002471**	0.0002146	0.0001862	**0.0005114**	**0.0005101**	**0.0007709**
	[.017]	[.086]	[.319]	**[.040]**	**[.042]**	**[.009]**
Issue Amount						
Amount of Issue	**-0.0000099**	-0.0000075	-0.0000112	**-0.0000250**	**-0.0000244**	**-0.0000430**
	[.036]	[.188]	[.190]	**[.027]**	**[.032]**	**[.001]**
Coupon Amount						
Fixed Amount	-0.0063638	-0.0094669	-0.0075729	-0.0124450	-0.0088317	-0.0132250
	[.198]	[.114]	[.395]	[.292]	[.458]	[.344]
Floating	-0.0097792	-0.0103320	-0.0080114	-0.0112810	-0.0127260	-0.0115060
	[.098]	[.150]	[.452]	[.424]	[.370]	[.490]
Variable	-0.0086382	**-0.0152860**	-0.0048444	-0.0050545	-0.0111980	-0.0109660
	[.160]	**[.040]**	[.662]	[.731]	[.450]	[.528]

Table 8 continued						
Standard and Poor's' Rating						
BBB	**0.0146940**	**0.0144790**	**0.0211760**	**0.0276520**	**0.0312320**	**0.0332800**
	[.000]	**[.001]**	**[.001]**	**[.002]**	**[.000]**	**[.001]**
BB	**0.0095916**	**0.0098311**	**0.0209690**	**0.0303750**	**0.0290840**	**0.0398260**
	[.002]	**[.009]**	**[.000]**	**[.000]**	**[.000]**	**[.000]**
B	0.0026752	0.0056209	0.0090041	**0.0188320**	**0.0157910**	**0.0219930**
	[.334]	[.094]	[.073]	**[.005]**	**[.018]**	**[.005]**
CCC	**-0.0111110**	-0.0045226	-0.0014278	0.0013702	-0.0113770	-0.0071331
	[.019]	[.429]	[.867]	[.903]	[.317]	[.593]
Exchange where Firms' Equity Trades						
NYSE	0.0096000	0.0027884	0.0033327	0.0090855	0.0058840	0.0080288
	[.099]	[.692]	[.750]	[.513]	[.673]	[.624]
NASDAQ	0.0058617	0.0008189	0.0035898	0.0049307	0.0093952	0.0121570
	[.242]	[.893]	[.692]	[.681]	[.436]	[.390]
AMEX	0.0069805	0.0074337	0.0024306	0.0062182	0.0103810	0.0152190
	[.176]	[.234]	[.794]	[.615]	[.403]	[.296]
Use of Proceeds						
Acquisition	0.0045094	0.0075442	-0.0028906	-0.0149060	-0.0184460	-0.0111230
	[.455]	[.302]	[.790]	[.300]	[.203]	[.512]
General Purposes	0.0012556	0.0054386	-0.0068604	-0.0223110	-0.0228700	-0.0153350
	[.808]	[.383]	[.459]	[.070]	[.064]	[.290]
Payment on Loans	-0.0044731	-0.0037177	-0.0199290	-0.0233640	-0.0228860	0.0095225
	[.573]	[.699]	[.163]	[.218]	[.232]	[.672]
Refinancing	0.0002221	0.0068254	-0.0051028	-0.0133180	-0.0209900	-0.0111760
	[.966]	[.276]	[.582]	[.279]	[.090]	[.442]
Callable Issue						
CALLLIST	0.0022286	0.0023128	0.0046936	0.0075392	0.0067480	0.0038925
	[.273]	[.344]	[.197]	[.118]	[.166]	[.496]
Market Conditions						
Bull Market	-0.0008343	-0.0012587	-0.0014793	-0.0017235	-0.0041326	-0.0009856
	[.674]	[.600]	[.679]	[.717]	[.387]	[.860]
Number of Issuances						
First-time Issuer	-0.0004204	0.0014789	0.0031312	0.0043592	0.0068151	**0.0108810**
	[.803]	[.469]	[.303]	[.280]	[.093]	**[.023]**
Normalized Ratios of Firm Performance						
Current	-0.0002474	0.0000485	**-0.0013058**	-0.0009478	-0.0001022	-0.0009509
	[.464]	[.906]	**[.033]**	[.242]	[.900]	[.319]
Total Asset Turnover	**-0.0018717**	**-0.0020339**	0.0014954	0.0025261	0.0016709	0.0022480
	[.012]	**[.024]**	[.263]	[.154]	[.350]	[.284]
Basic Earnings Power	-0.0001001	0.0000833	0.0005516	0.0002345	0.0007163	0.0001796
	[.644]	[.751]	[.159]	[.652]	[.171]	[.770]
Debt	-0.0009344	0.0020170	-0.0049371	-0.0081707	-0.0030156	-0.0100600
	[.685]	[.471]	[.236]	[.137]	[.585]	[.121]
R-squared	0.5355760	0.5158100	0.4937000	0.4355960	0.4475870	0.4275590
Adjusted	0.5176340	0.4971040	0.4741400	0.4137910	0.4262460	0.4054440
observations	700	700	700	700	700	700

The impact of the variables tested over the CAR is determined by the sign of the variables as well as the sign of the intercept. The relationships identified and the impact of the variables on the cumulative return in Table 7 remained throughout Table 8. Four new variables are tested in Equation 7 with the results listed in Table 8. These variables are normalized measures of firm performance and include the current, total asset turnover, basic earnings power and a ratio of debt management. All four variables of firm performance have varied signs of the intercept over the observation windows tested. Only the current and the total assets turnover ratios reveal significance in determining a CAR.

2.4.3.3 Industry speaking

The final series of cross-sectional regression tests categorizes each issuing firm by the industry they participate as indicated by their respective SIC code. These tests use a firms' industry classification to capture any industry effects that may be prevalent with issuing debt. Appendix A is a descriptive list of the Standardized Industry Classification (SIC Code) codes.[27] Tests taking into consideration a firms' industry code explained the greatest amount of variation in the regression equation (Equation 8). Table 9 reveals the results of this line of testing. The R^2 when including a variable to identify the firms' industry classification ranges from .5429 in the 1-day event window to .4402 in the 11-day window. This compares to a range of .5300 to .4254 in the first series of regressions which does not take into account firm ratios or industry characteristics.

Table 9 shows the results of the regression using Equation 8 which includes categorizing the firm by it's SIC code. The age of the firm, amount of the issue and bonds rated BBB, BB and CCC are shown to have statistical significance in the 1-day window while the length of the issue and bonds with a rating of BBB, BB and B are significant in the 3-day window test. The test over the 5-day window shows the length of the issue, bonds of BBB and BB rating and the current and debt management ratios have significance. The last three windows tested (7-day, 9-day and 11-day event windows) have very similar results. The length of the issue is significant in the 7-day and 11-day windows with the age of the firm at issuance and

[27] Firms of the 2000 and 3000 SIC are tested as industries in the same classification. Service industries categorized at 7000 or 8000 SIC code firms are grouped together for testing purposes as well.

Table 9

Regression Relating the Cumulative Abnormal Return Surrounding an Announcement of a High-Yield Debt Issuance to Bond and Firm Specific Characteristics that Include the Issuing Firms Standardized Industry Classification

The ordinary least squares cross-sectional regression of the cumulative abnormal return is tested surrounding the announcement of a high-yield debt issuance ion a variety of test windows that include the announcement date to the first day after the announcement (0,1) to a range of 5 days before and after the announcement (-5,5) or an 11-day window. Coupon amount is a dummy variable that is categorized based on a fixed, floating or variable amount. Amount of Issuance is a dummy variable based on the size of the issue with respect to dollar amount. The Years to maturity dummy classification distinguishes the issuances by the number of years from issuance the bond will mature. The rating of issue takes a dummy variable format and takes into account the issues Standard and Poor's rating. Age of the firm at issuance is analyzed while a dummy variable is used to for callable bonds in nature. The exchange in which the issuing firms equity trades at time of issuance is also represented by dummy variables. A dummy variable is used to identify whether a firm issuing high-yield debt for the first time is of any significance. A dummy variable is used to determine whether market condition has any effect on the cumulative abnormal return. The use of proceeds is represented with dummy variables noting the issuing firms reported use of proceeds from the issue. Normalized ratios of firm performance are used to capture if firm performance is a determinant of a cumulative abnormal return while the normalization of the variable will remove any industry effects. Dummy variables representing the issuing firms SIC code are included to test for any industry effect over the cumulative abnormal return. P-values are in brackets.

Window	1-Day	3-Day	5-Day	7-Day	9-Day	11-Day
Variable						
Intercept	**-0.0744800**	**-0.0830950**	**-0.0947890**	**-0.0775470**	**-0.1192550**	**-0.1259930**
	[.000]	**[.000]**	**[.000]**	**[.014]**	**[.000]**	**[.001]**
Length of Issue						
Years to Maturity	0.0002667	**0.0004250**	**0.0004927**	**0.0007043**	**0.0006662**	0.0007215
	[.055]	**[.012]**	**[.050]**	**[.034]**	**[.045]**	[.064]
Age						
Firm Age at Issue	**0.0002162**	0.0001786	0.0002348	**0.0005532**	**0.0005101**	**0.0008280**
	[.039]	[.162]	[.217]	**[.029]**	**[.045]**	**[.005]**
Issue Amount						
Amount of Issue	**-0.0000109**	-0.0000083	-0.0000133	**-0.0000271**	**-0.0000263**	**-0.0000461**
	[.022]	[.154]	[.123]	**[.018]**	**[.022]**	**[.001]**
Coupon Amount						
Fixed Amount	-0.0056918	-0.0089295	-0.0056588	-0.0112430	-0.0071955	-0.0125600
	[.249]	[.138]	[.526]	[.341]	[.544]	[.367]
Floating	-0.0094405	-0.0100920	-0.0050203	-0.0087121	-0.0095890	-0.0082754
	[.111]	[.162]	[.638]	[.537]	[.499]	[.618]
Variable	-0.0061518	-0.0139630	-0.0040383	-0.0047572	-0.0091004	-0.0124200
	[.320]	[.064]	[.718]	[.748]	[.541]	[.476]

Table 9 continued						
Standard and Poor's' Rating						
BBB	**0.0164550**	**0.0154980**	**0.0206430**	**0.0279310**	**0.0309070**	**0.0312550**
	[.000]	**[.001]**	**[.002]**	**[.002]**	**[.000]**	**[.003]**
BB	**0.0106930**	**0.0102220**	**0.0195170**	**0.0294460**	**0.0277550**	**0.0369820**
	[.001]	**[.008]**	**[.001]**	**[.000]**	**[.000]**	**[.000]**
B	0.0041143	**0.0067296**	0.0096729	**0.0192520**	**0.0164120**	**0.0216580**
	[.139]	**[.047]**	[.055]	**[.004]**	**[.014]**	**[.006]**
CCC	**-0.0097356**	-0.0035668	-0.0011775	0.0031507	-0.0089528	-0.0056201
	[.040]	[.536]	[.890]	[.780]	[.430]	[.673]
Exchange where Firms' Equity Trades						
NYSE	0.0101940	0.0024068	0.0025619	0.0086308	0.0056282	0.0059064
	[.082]	[.736]	[.809]	[.538]	[.689]	[.720]
NASDAQ	0.0049793	0.0019980	0.0022240	0.0021718	0.0072263	0.0087358
	[.322]	[.745]	[.807]	[.857]	[.550]	[.538]
AMEX	0.0072740	0.0072465	0.0024938	0.0059965	0.0110990	0.0147280
	[.161]	[.251]	[.790]	[.629]	[.373]	[.313]
Use of Proceeds						
Acquisition	0.0049993	0.0080712	-0.0005037	-0.0120340	-0.0157540	-0.0082487
	[.411]	[.276]	[.963]	[.405]	[.278]	[.628]
General Purposes	0.0018618	0.0058301	-0.0044653	-0.0196600	-0.0201740	-0.0124330
	[.720]	[.355]	[.632]	[.111]	[.104]	[.392]
Payment on Loans	-0.0032873	-0.0028603	-0.0167020	-0.0193460	-0.0187360	0.0128140
	[.681]	[.770]	[.247]	[.311]	[.330]	[.571]
Refinancing	0.0010491	0.0073232	-0.0016566	-0.0100680	-0.0181250	-0.0078197
	[.841]	[.249]	[.860]	[.416]	[.145]	[.592]
Callable Issue						
CALLLIST	0.0022222	0.0025129	0.0043614	0.0077070	0.0067912	0.0046553
	[.275]	[.308]	[.232]	[.111]	[.163]	[.415]
Market Conditions						
Bull Market	-0.0009362	-0.0014275	-0.0013209	-0.0006541	-0.0027211	0.0006139
	[.640]	[.558]	[.715]	[.891]	[.571]	[.913]
Number of Issuances						
First-time Issuer	-0.0005656	0.0013736	0.0028424	0.0051341	0.0076635	0.0116320
	[.738]	[.506]	[.353]	[.205]	[.060]	[.015]
Normalized Ratios of Firm Performance						
Current	-0.0002714	-0.0000929	**-0.0011537**	-0.0011158	-0.0003268	-0.0011015
	[.343]	[.790]	**[.027]**	[.104]	[.635]	[.173]
Total Asset Turnover	-0.0024454	-0.0021334	0.0010314	0.0022848	0.0039504	0.0038150
	[.056]	[.169]	[.654]	[.454]	[.197]	[.288]
Basic Earnings Power	-0.0015952	0.0002345	0.0076231	0.0029837	0.0113520	0.0067432
	[.556]	[.943]	[.120]	[.646]	[.082]	[.378]
Debt	-0.0042215	0.0010026	**-0.0141850**	**-0.0204940**	-0.0154270	**-0.0265160**
	[.251]	[.823]	**[.034]**	**[.019]**	[.080]	**[.010]**

Table 9 continued						
SIC Code						
1000	0.0030390	-0.0024055	-0.0003178	-0.0328110	-0.0125680	-0.0130690
	[.741]	[.830]	[.985]	[.137]	[.570]	[.615]
2000	0.0135870	0.0083501	0.0022841	-0.0257660	-0.0077456	-0.0110710
	[.134]	[.450]	[.889]	[.235]	[.722]	[.664]
3000	0.0125180	0.0043608	-0.0028603	-0.0321690	-0.0149290	-0.0209980
	[.164]	[.691]	[.860]	[.135]	[.489]	[.407]
4000	0.0125510	0.0054465	0.0065560	-0.0210130	0.0020031	-0.0014023
	[.161]	[.617]	[.685]	[.326]	[.926]	[.956]
5000	0.0162970	0.0064042	-0.0011338	-0.0184380	-0.0019860	-0.0064503
	[.076]	[.566]	[.945]	[.401]	[.928]	[.803]
7000	0.0076605	0.0038534	-0.0018093	-0.0219510	-0.0063656	-0.0007815
	[.405]	[.731]	[.913]	[.319]	[.773]	[.976]
8000	0.0132520	0.0034229	0.0055715	-0.0239410	-0.0055802	-0.0115280
	[.164]	[.768]	[.746]	[.293]	[.807]	[.667]
R-squared	0.5429550	0.5174690	0.4995900	0.4452820	0.4588580	0.4402610
Adjusted	0.5203090	0.4935600	0.4747950	0.4177960	0.4320450	0.4125260
observations	700	700	700	700	700	700

the issue amount being significant determinants of the CAR in all three event windows. Bonds with ratings of BBB, BB and B are also shown to be a significant determinate in the latter observation windows. The debt management ratio is the final variable determined to have significance over the CAR. This takes place in the 7-day and 11-day windows.

The inclusion of a test variable segregating the data by the firms' industry classification has mixed results. The sign of the intercept was determined by the cross-sectional regression. The sign of the intercept changes for each industry classification, variant upon the test window. One interesting thing to note is the lack of significance by testing the firms' industry classification in determining a CAR. Given the lack of significance with the SIC code variable, this suggests the industry classification has no impact over the cumulative return.

2.4.4 Variables of the Regression

The intent of this line of research is to identify various characteristics that are significant in determining the abnormal return that surrounds an issuance of HYD. Using the abnormal return as the

dependent variable, and various bond and firm characteristic variables as explanatory variables, it can begin to explain the CAR that surrounds an announcement of a HYD issuance. All observations in the database experience a negative abnormal return surrounding the announcement of a high-yield bond issuance. The age of the firm at issuance is selected as an independent variable and found to be significant in determining the CAR. The intercept is of positive value which will lead to a positive impact on the return. This positive impact lowers the amount of the negative CAR which supports the hypothesis the older the firm at issuance, the lower the CAR will be. The amount of the issuance is found to have a negative intercept as a result of the regression. The negative coefficient will have a negative impact over the CAR; this will contribute to a more negative CAR. This evidence supports the hypothesis of the lower the issue amount, the less negative the CAR, this is also found to have statistical significance. The coupon amount is classified as a fixed amount, floating or variable. In only one instance does this variable show significance. This happens in Equation 7 where the variable coupon rate has statistical significance in the 3-day window. The sign of the intercept is negative showing a variable coupon rate to increase the value of the negative CAR. With only one instance revealing significance, this provides only minimal justification at best supporting the hypothesis of the lower the coupon amount, the less negative the CAR.

The rating of the issue proves to be a significant determinant with all four rating classifications proving this relationship. However, bonds with a rating of BBB, BB and B have a positive intercept while bonds of CCC rating have a negative. Bonds in the “B” range will have a lower the CAR than BBB-rated and BB-rated bonds while CCC-rated bonds will cause it to increase. These relationships support the hypothesis the better the credit rating of the bond, the less negative the CAR. First-time high-yield bond issuers are shown to have a mixed intercept value in the windows observed. First-time issuers are proven to have significance in Equation 6 and 7, being significant at the 11-day window with a positive intercept. This result at the 11-day test window supports the hypothesis stating that first-time issuers will have a lower CAR than seasoned high-yield bond issuers. The debt management ratio also has explanatory power over a CAR. The test results reveal a negative intercept value which would suggest the debt management ratio contributes to the negative CAR. These results support the debt management hypothesis which states the lower the firms’ debt management ratio, the less negative the CAR will be.

Several variables tested did not reveal any significance over the CAR, this includes the years to maturity, the exchange where the equity of the firm trades, the use of proceeds, whether the issue is callable or not, and if the market is in a bull or bear state. The regression results show the length of the issue is a statistically significant determinant of a CAR. However, the positive value of the intercept will lead to a positive impact on the return, lowering the CAR. This variable is not significant and does not support the hypothesis the shorter the length of the issue, the lower the CAR. It was hypothesized the better the stock exchange the firm participates, the less the negative CAR. The results do not support this hypothesis. The results also do not support the hypothesis that firms issuing high-yield debt for merger\acquisition and general purposes will have less of a CAR than firms issuing for repayment refinancing purposes. The results of the regression do support the hypotheses for both callable bonds and markets conditions. I expected to find that callable bonds will have less of a less negative CAR than non-callable bonds and bonds issued in bear markets will have a less of a negative CAR than bonds issued in a bull market. While these relationships are supported by the results, these variables are not found to be of significance in determining the CAR.

Measures of liquidity and asset management are found to be statistically significant determinants of the CAR, but the negative intercept value refutes the expected relationship. Ratios of liquidity and asset management are not significant since the results do support the hypotheses stating the higher the firms' current and total asset turnover ratios, the less negative the CAR will be. Additionally, a measure of firm profitability was tested using the basic earning power ratio. This was found to have no explanatory power and does not support the hypothesis stating the higher the basic earning power ratio, the less the negative CAR. In instances where the intercept value is positive, a more negative CAR will happen. The final testing variable infused into the sample is done in Equation 8 with the addition of the industry classification variable. Table 9 reveals the results of this inclusion and shows the industry classification of the firm has no impact over the CAR. The results further do not support the hypothesis stating that older, more established industries should exhibit less negative CAR.

2.5 Conclusion

The first series of testing conducted in this chapter finds statistically significant negative abnormal stock returns surround an announcement of an issuance of HYD. The second major part of this research attempts to explain the significant return through a series of cross-sectional regressions. This line of research finds significant negative abnormal returns exist surrounding an announcement of HYD issuance. It is also found that various bond and firm characteristics contribute to the composure of an abnormal return. Further work is still necessary to fully understand what causes the significant abnormal return that encumbers an announcement of HYD. The evidence of significant explanatory variables in this research provides a partial explanation for contributing factors of an abnormal return.

CHAPTER 3

VARIABLES AFFECTING THE YIELD SPREAD OF HIGH-YIELD BONDS

3.1 Introduction

High-yield bonds are issued by firms which do not qualify for "investment grade" rated bonds by one of the leading credit rating agencies (S&P and Moody's' are the two most common). High-yield bonds in many cases offer greater yields to compensate for the significant increase in credit risk. Some investors place these types of bonds in their portfolio because of the higher rate of income generation from the higher coupon payments, and they offer the potential for capital appreciation if the borrower's debt rating is upgraded due to improved earnings, mergers or acquisitions, positive industry developments, etc.

Research on the investment grade corporate bond market has been abundant, while research on the high-yield corporate bond market has been avoided by most. However, this market accounted for $174 billion of new issuances between 1997 and 2002.[28] In the 1980s, investors viewed high-yield debt as "story bonds" in which the value was not derived from financial ratios. During the 1990s, there are large discrepancies between the preliminary pricing of high-yield debt instruments by underwriters and the actual price of the bonds at issuance.

This chapter attempts to fill the void in current research by identifying various bond, and company specific variables that have an impact over the pricing of newly issued bonds, by assessing the spread above the prevailing Treasury yield at the time of issuance. Section 2 surveys the various academic research which attempts to evaluate risk. Section 3 is the literature review looking at the research to identify the variables that determine how to price a high-yield and the various models that attempt to determine yield premium and yield spread, and evaluates the trends over the high-yield debt issued.

[28] Private issues of debt are excluded from this estimate. Bond statistical information is from The Bond Market Association publication, "An Investors Guide to High-Yield Bonds" 2000.

Section 4 presents the testing methodology used in the model derived in this research and presents the results of the regressions performed. The final section or Section 5 is the conclusion.

3.2 Literature Review

Academic literature shows that non-investment yields change along with movements in the interest rates of risk-free assets or Treasury securities with qualities similar of those found with investment grade assets. A significant amount of research has been directed at the pricing of corporate debt. Boardman and McEnally (1983), Silvers (1973) and Fisher (1959) have established there are three basic factors that account for pricing new issuances of debt: default risk, interest rate risk and liquidity. Where high-yield issues differ from their investment grade counterparts is that they are more sensitive to these factors given their position in the capital structure and their credit rating. These three factors for pricing new issuances of debt will be evaluated further.

3.2.1 Defining Risk

3.2.1.1 default risk

When the quality of an issuance decreases, the default risk will start to dominate the interest rate risk with respect to bond valuation. By analyzing yield as compared to yield spread, the strength and significance of changes in Treasury rates on the yield of non-investment grade bonds can be studied. Default risk has a major influence over credit yields and spreads. Fridson and Jonsson (1995) find the Moody's trailing-12-month default rate for high-yield debt and an index of lagged economic indicators[29] will have a statistically significant effect on changes in yield spreads. However, when testing an index of leading economic indicators, it was found to have no statistical significance. Barnhill, Joutz and Maxwell (2000) find that the Moody's trailing-12-month default rate is a significant variable in both the long and short run. Both the literatures of Barnhill et al. (2000) and Fridson and Jonsson (1995) focus on the bond market as a whole. While it is standard practice that investors price bonds on the future probability of default and not information from the past, Broughton (2000) suggests that investors place a tremendous amount of emphasis on the past information in pricing risky debt.

[29] The economic indicators used include changes in the Merrill Lynch Treasury master index, changes in implied volatility of 30-year Treasury bond futures, changes in the Russell 2000 and S&P 500 Index returns and changes in volatility over both indexes.

Shane (1994), Ramaswami (1992) and Bookstaber and Jacob (1986) use equity indexes as a determinant of default risk. High-yield debt is generally issued in a subordinated position; this means investment grade bondholders will have first access to assets if the firm goes astray. A host of academics have shown the correlation of returns on high-yield bonds with equity indices. This relationship is also consistent with the Black and Scholes (1973) model of capital structure which also has been referred to as the contingent claims analysis. Smith and Warner (1979) and Black and Cox (1976) both used a contingent claims analysis to prove that unsubordinated or senior debt should be priced higher and have a lower yield spread than subordinated debt. This theory is supported on both investment and high-yield debt by the observed correlation structure of returns. To date there is not an equity index available for firms that have non-investment grade debt outstanding. Most academic research comprises a correlation analysis performed on a number of stock indices to determine the best index to use in their research. I will extend this line of research by segregating the data by the market in which the issuing firm participates. Previous research has combined all indices as a mitigating factor no matter which market the firm is a participant.

3.2.1.2 interest rate risk

Interest rate risk has been shown to be the leading variable that affects the value of investment grade bonds. Consequently, when credit quality decreases, the default risk begins to dominate the interest rate risk with respect to bond valuation. The impact of the changes in the Treasury rates on the yield of non-investment grade bonds can be studied by evaluating yield as compared to yield spread. At the end of 2000, the CS First Boston Aggregate Index had an average maturity of 7.85 years and duration of 4.35 years. This perhaps may not be an accurate measure to use since most bonds have a call feature which effectively decreases the maturity and duration.

Models developed to find yield premium and yield spread provide a framework to evaluate factors which affect the default risk associated with high-yield debt. However, Barnhill et al. (2000) found that neither model properly factored into account interest-rate risk. They believe when using a correlation and cointegration analysis, interest rate risk is not constant or is a simultaneous event in correlation or

cointegration models. Instead they believe a broader model should be developed that would allow interest rate and default risk to vary over time. Systems and single-equation models find varying adjustments to disequilibrium. Although long-term equilibrium exists, short-term dynamics can significantly impact the short-run relationship. Lower rated indices exhibit slower reversion toward equilibrium and larger short-run dynamic changes in yield. Also observed in a long-run equilibrium, short-run dynamic factors affected the monthly yields.

It is also necessary to understand the determinants of risk and spread for high-yield debt issues on an individual basis. While much academic work has been done in this area, banks and financial institutions are concerned with macro movements in the credit markets. The risks created by these movements can have important consequences pricing the firm's assets and derivatives as well as pricing the issue for the developing markets for credit derivatives. Understanding the factors that influence yields on corporate bonds is not new. Joutz and Maxwell (2002) define variations in Treasury yields, Moody's default rates, and mutual fund volume will continue to affect the high-yield debt market in the short-run. It is also found that external shocks have a greater impact on high-yield debt when compared to its investment grade counterparts.

3.2.1.3 liquidity risk

Firms issuing high-yield debt instruments are extremely sensitive to liquidity in the high-yield marketplace. Firms using this type of debt have limited themselves to not having the ability to access the more stable bank financing which in turn means they face greater problems when trying to raise capital. High-yield debt issuing firms performance and investment spending relies greatly on cash flow, the ability to leverage, and other balance sheet factors. This implies they are susceptible to current and future expectations toward the business cycle and any changes in monetary policy by the Federal Reserve Board.

Warther (1995) finds the level of mutual fund investment activity influences stock and bond returns. In today's market, mutual funds make up a large segment of the market. The volume of mutual

fund trading and the liquidity position of the mutual funds can have a sizeable effect on the market yield. Fridson and Jonsson (1995) find that increased fund flow into high-yield debt, as a percentage, is associated with the narrowing of the yield spread and an increase in the price of non-investment grade securities. Barnhill et al. (2000) finds an increase in the amount of assets held as liquid securities, as percentage of high-yield assets, was associated with an increase in yield spread and a decrease in the price of non-investment grade securities.

A second factor with respect to liquidity, or perhaps the loss of liquidity occurred when Drexel Burnham Lambert went into distress themselves. At the time, Drexel Burnham Lambert was the largest underwriter and market maker in the high-yield bond market when it filed for bankruptcy protection in February 1990. Cornell (1992) found the Drexel Burnham Lambert bankruptcy had an effect on the overall marketability of high-yield bonds. This lack of marketability impacted the high-yield debt market for several years. While Drexel Burnham Lambert is still the top primary issuer of high-yield debt some 10 years after filing bankruptcy, many firms have a significant interest in this market. For the period 1983-2001, there are 475 different investment houses having an interest in at least 1 high-yield issue. Drexel Burnham Lambert still leads the list, but there has not been a lack of interest in replacing Drexel Burnham Lambert in being the top issuer of high-yield debt. The second through sixth largest issuers are Merrill Lynch, Goldman Sachs, Donald Lufkin and Jenrette, Solomon Brothers and Bear Sterns. They have risen to become major players in the marketplace for non-investment grade debt and are a part of 2245 issues of a total 7083 issues or 31.70%. When adding Drexel Burnham Lambert to the number of issues the top 5 issuing companies are a part of increases to 2938 or 41.48% of the issues listed in the SDC database with lead underwriter identified.

3.2.2 Pricing Models

It has been shown in the previous research that non-investment yields change along with changes in the risk-free rate similar to their investment grade counterparts. While this addresses movements in the spread, academic research provides various theories to explain why a spread exists. Currently there are three generations of yield premium and yield spread models used to explain the

spread. The first generation highlighted the market yield premium for holding risky debt. That is, the average yield spread between a risk-free security such as a Treasury note and a risky debt securities issue. This approach is referred to as a break-even approach that analyzes the long run. It calculates if there is a net return (yield premium minus default rate) by holding risky bonds in the long-run. The second generation model incorporates the first-generation model by the inclusion of default risk in the long run, and processes information with the second-generation framework of yield premium models by focusing on short-run dynamics. A third generation model focuses on yield spread in the short-run. This model features variables that take into account various measures of liquidity and default risk.

Fons (1987) presented the first effort to define a relationship between the risk premium required by investors of high-yield bonds and the actual risk of default. A model of low-rated bond pricing using a risk-neutral investor is developed to estimate anticipated default rates on these issues. The series is then compared to the actual default of high-yield debt issues. Fons (1987) concluded that the default rates suspected in corporate bond returns exceed those actual occurrences in recent years. This implies that holders of well diversified portfolios that are comprised of high-yield debt will be rewarded for bearing default risk. Fons (1987) further believes there is a systematic mis-pricing of high-yield bonds by the investment community, or the risk neutral model used does not capture all the probability of default.

Altman and Bencivenga (1995) showed that a bond yield should compensate the investor for several factors of risk including; expected risk, the timing of default, and the severity. The severity refers to the recovery rate; this is whether the issue will default and the bond will either sold immediately, or be held until the company emerges from Chapter 11 bankruptcy. The overall loss from default increases by the opportunity loss since the defaulting bonds will exhibit a non-payment of its semiannual coupon.

A second type of model introduced to predict yield premium and yield spread is by cointegration. Two different methodologies have been developed using cointegration for testing. The first approach used a single-equation approach pioneered by Engle and Granger (1987) methodically named the Engle–Granger Methodology. This approach is favored in bivariate analysis, but it is inadequate in a multivariate

framework or a systems approach. Johassen developed a better and more robust methodology in 1988 and 1991. This became to known as the Johansen's maximum likelihood procedure for finite-order vector autoregressions (VARs). These yield premium models and yield spread models provide a framework to evaluate factors which affect the risks surrounding high-yield debt. However, Barnhill et al. (2002) find that neither model properly factored into account interest-rate risk. They believe when using a correlation and cointegration analysis, interest rate risk is not constant, or is a simultaneous event in both models. Instead a broader model should be developed that would allow interest rate and default risk to vary over time. This would provide a better framework to define the long-term relationship between default rates, Treasury yields, and the yields on high-yield debt. The systems and single-equation models found varying adjustments to disequilibrium. Although long-term equilibrium exists, short-term dynamics can significantly impact the short-run relationship. Lower rated indices exhibit slower reversion toward equilibrium and larger short-run dynamic changes in yield. Also observed in a long-run equilibrium, short-run dynamic factors affected the monthly yields.

Fridson and Jonsson (1995) showed that evaluating the high-yield spread in comparison to the prevailing long-term Treasuries spread would not serve as an adequate market predictor when evaluating the model when applying historical data. At the time of publication, the editor of the Journal of Fixed Income made the following comment, "While we understand that it is conceptually possible, the almost total absence of usefulness of the yield spread is striking, and perhaps disturbing from traders and researchers." This lead to Fridson and Jonsson (1995) developing the second generation of high-yield spread models which focus on measuring the prevailing market risk. Their main argument is that the spread over and above the Treasury spread should be treated as a risk premium and this should vary as the level of risk changes. They proceed to measure the prevailing risk in the marketplace and use this in a regression setting using yield-spread methodology developed by Fisher (1959). Ma, Rao and Peterson (1989) adapted this methodology to measure the new-issue spreads on high-yield bonds and agree the spread should be treated as a risk premium.

Fridson and Jonsson (1995) identify a series of explanatory variables in an attempt to measure default risk and market liquidity. They identify broker loan rate, monthly count of news articles over high-yield bonds and new issuances as liquidity indicators for default risk. They also identify several variables to explain the variance in the spread. These variables include the Moody's Trailing-Twelve-Month Default Rate, an Index of Lagging Economic Indicators[30], Mutual Fund Flows as a Percentage of Fund Assets, Cash as a Percentage of High-Yield Mutual Fund Assets, and the Three-Month Moving Average Price of the Merrill Lynch High-Yield Master Index. The rationale is that business conditions may have an influence over amount of default risk. In turn, investors may anticipate changes in default risk by evaluating leading economic indicators.

Fridson and Jonsson (1995) used the five variables that are identified in the previous paragraph in a general log regression framework to test for statistical significance when comparing high-yield spread to Treasury spread. Using 108 observation periods (monthly data between December 1984 and December 1993) they find that mutual fund flows, cash as a percentage of high-yield mutual fund assets, default, price, and various lagged economic indicators developed into an index are all statistically significant with a t-statistic above 2. In addition, Fridson and Jonsson (1995) also find that the regression framework generally underestimates the high-yield spread. However, when the Treasury spread is above its historical average, this does not mean the high-yield spread is undervalued, and in fact a trading strategy based on this will not provide excess or abnormal returns. Fridson and Jonsson (1995) further showed the spread does not vary for non-fundamental reasons to an extent that is exploitable. Rather the risk premium changes as systemwide risk changes. The marketplace appears to reflect these changes with sufficient price to preclude profiting without forecasting the relevant risk factors accurately and well in advance.

It is also necessary to understand the determinants of risk and spread for high-yield debt issues on an individual basis. While much academic work has not been done in this area, banks and financial

[30] The Index of Lagged Indicators comprised the prevailing unemployment rate, the GDP and the inflation rate.

institutions are concerned with macro movements in the credit markets. The risks created by these movements can have important consequences over pricing the firm's assets and derivatives as well pricing the issue for the developing markets for credit derivatives. Fridson and Garman (1998) use a multiple regression model in an attempt to identify company specific and environmental variables that are significant in determining the spread for a new issuance of high-yield debt compared to the prevailing Treasury rate. Choosing a window between 1995-1996 for the sample period, they use 428 issues as the sample with complete information to match their hypothesis with a series of company specific variables.[31] Their results show nine variables are statistically significant at the 97% confidence level and explain 56% of the variance in the regression equation. The significant variables include; rating, zero-coupon status, BB-B spread[32], seniority, callability, term, first-time issuer, underwriter type and interest rate changes. This equates to seven of the nine variables that are statistically significant are of company specification. It is here the opportunity for further research is present. Further research needs to be completed to isolate which company specific and environmental variables impact the spread of a new issue as well as exploring all rating classes of high-yield debt. Extending the research of Fridson and Garman (1998) through the use of a database that encompasses more observations, a longer time horizon and more environmental and company specific variables, a better understanding of the determinants of the yield spread for new issuance of high-yield debt between the spread at issuance and the prevailing Treasury rate can be determined.

[31] Company specific variables include rating, seniority, term and callability of the issue, coupon status, amount of the issue, 144a status, first time issue and underwriter type (investment of commercial bank).
Environmental variables include spread versus Treasury, BB-B spread, yield curve, default rate, IBO volume, number of uncompleted issuances, mutual fund flows, interest rate change and high-yield return.

[32] BB-B spread is believed that new issues may not only be sensitive to changes in the risk premium on high-yield debt as a group but subject to changes in the intra-market spread.

3.3 Data and Methodology

The data used in this chapter comes from the same two sources as the previous essay. New issuances of high-yield debt issued are examined for the period 1983-2003 and are extracted from the SDC database. Data unique to each bond issuance observation taken from the SDC database includes: spread, rating, exchange of issuer, the use of proceeds, coupon amount, callability of the issuance, length of the issue, amount issued, and identifying first-time issuers. The sample includes 4,217 issuances of high-yield debt by public firms. I omitted 1,827 observations from the dataset for not having complete information over the variables above. This leaves 2,390 issuances of high-yield debt to be observed. Fridson and Garman (1998) completed research with respect to pricing high-yield debt by observing the variance in the prices as functions of quantitative factors. Next, I seek out firm specific variables in order to complete a series of cross-sectional regressions to explain the spread at issuance. Financial statements from Compustat are used to gain an understanding of the position of a firm at a given point in time, and can be used as a predictor of future earning and dividends. It is along these lines that I have selected firm specific ratios to explain the spread at issuance against the prevailing Treasury rate that surrounds an issuance of high-yield debt. I will test firm performance ratios of liquidity, asset management, debt management and profitability to complete the cross sectional analysis. Information pulled from the Compustat database to compute these ratios includes; total current assets, current assets, total current liabilities, current liabilities, earnings before interest and taxes and sales. Other information extracted from the Compustat database includes the SIC code of the firm and market conditions at issuance. The Compustat database was used to match the 2,390 observations with full information in the SDC database with complete information in respect to financial information. After eliminating observations in the database for incomplete information the end result netted 703 observations. Figure 2 shows each of the variables selected and its origin.

Fridson and Garman (1998) completed research with respect to pricing high-yield debt by observing the variance in the prices as functions of quantitative factors. Their intent was to measure how the new issue market reflects objective considerations. They further investigated the value added, if any,

Figure 2 - Variable Used and Data Sources

Figure 2 shows the data used and provides a brief description of the data and list the source of the data.

Title	Description	Data Source
Bond Specific		
Spread	Spread above prevailing Treasury Rate	SDC
S&P rating	Dummy variables: BBB, BB, B, CCC, NR	SDC
Exchange	Dummy variables: NYSE, NASDAQ, AMEX, Over the Counter	SDC
Use of Proceeds	Dummy variables: acquisition, general purpose, pmt on borrowings	SDC
	refinancing activity, other uses	SDC
Coupon Amount	Actual coupon amount expressed in percentage of the par value	SDC
Callable	Dummy variables: callable or non-callable bond	SDC
Yrs to Maturity	Actual number of years for the bond to reach maturity	SDC
Amount Issued	Amount of each individual issuance	SDC
High-Yield Bond IBO	Dummy variable: First Time Issuer	SDC
Company Specific		
Total Current Assets	earned the year of the issuance ($millions)	Compustat
Total Assets	earned the year of the issuance ($millions)	Compustat
Total Current Liabilities	earned the year of the issuance ($millions)	Compustat
Total Liabilities	earned the year of the issuance ($millions)	Compustat
EBIT	earned the year of the issuance ($millions)	Compustat
Sales	earned the year of the issuance ($millions)	Compustat
SIC Code	Firm industry identification variable	Compustat
Market Specific		
Market Conditions	Dummy Variable: Bull or Bear Market	Compustat

by the underwriting process through the effectiveness in presenting the issue to analysts and portfolio managers. The research revealed that the pricing of newly issued high-yield debt is sensitive to various characteristics of the issuance and the market environment. They find that the yield spread against the prevailing long-term Treasury rate will be greater when the high-yield issuance is low in seniority with the firms existing debt, has a long maturity time span, whether the bond is callable, if it is a zero coupon bond, the firm is a first time high-yield issuer, and whether the issue is underwritten by a commercial bank.

Fridson and Garman (1998) provide support that company specific variables impact the spread of an issuance. They use a database of 428 observations that encompasses issuances of high-yield debt for the years 1995 – 1996. I expand this line of research by using ordinary least squares[33] regression to regress the bond and firms specific variables extracted from the SDC and Compustat databases identified previously against the spread at issuance. This will capture any bond idiosyncrasies that impact the spread similar to Fridson and Garman (1998). By using a larger database, a longer evaluation period from 1983-2003 and employing more variables of performance and liquidity, a better understanding of what impacts the spread of a high-yield bond at issuance will be achieved.

I will regress the bond and firm specific variables against the spread at issuance to gain an understanding how these variables may impact the spread. The cross-sectional regressions feature ordinary least squares regression using the bond characteristics of the issue. The general form of the equation is:

$$spread_i = f(bond - sprecific - \text{var}iables)_i + w_i, \quad i = 1,\ldots\ldots,n. \tag{10}$$

where w_i is the disturbance term

The dependent variable in the regression will be the spread at issuance above the prevailing Treasury rate (in basis point form), while the independent variables will be the bond characteristics. This series of regression will determine whether the characteristics of the issuance are a determinant of the spread of new issues. The importance of each bond specific variable includes:

- Coupon Amount – Similar to their investment grade counterparts, high-yield debt issues generally offer an investor coupon payments. These coupon payments are listed at the time of issuance and are stated in a fixed value and generally range between 5%-11% of the face value of the bond. All observations in the dataset used are of this nature. No bonds of floating or variable coupon rates were used in this analysis. The coupon amount is used in the regression analysis to determine whether it is an

[33] The general form of the equation is presented in Equation 10.

explanatory variable over the spread. While it is widely shown in academic research investors require higher yield for assuming more risk, the role of the coupon payment with respect to high-yield bonds has been overlooked. The anticipated the sign of the coefficient generated from the regression is positive. This will increase the amount of the spread over the prevailing treasury rate. High-yield bonds offer higher coupon payments to investors compared to their investment grade counterparts. This excess coupon amount paid by issuing firms is used to lure investors to invest in bonds of higher risk. However, higher required interest payments will place an excess burden on the firm and will reflect upon its financial performance. I hypothesize the higher the coupon rate, the larger the spread will be. *Impact: positive variable, positive coefficient. This will increase the amount of the spread at issuance.*

- Years to Maturity – The years to which the bond matures is being evaluated to get a general idea if the pricing decision is reflective over the length of an issue and is properly priced as reflected by the spread at issuance. Bonds with a greater maturity are expected to have a higher default risk and maturity premiums built into the pricing decision. It is this rationale that is being tested in the regression to capture if this relationship holds true in the high-yield marketplace. I expect to find that years to maturity will have a negative impact on the spread at issuance. Academic literature reveals investment grade bonds of longer term have high default and maturity risk premiums as a part of the pricing decision. I expect to find that years to maturity will have a negative impact over the spread at issuance, i.e. the longer the years to maturity of an issue, the more impact on the pricing decision. For example, a high-yield debt instrument issued for 1-5 years will have lower default and maturity risk premiums built into the spread than a bond issued for 16-20 years. Academic literature reveals investment grade bonds of longer term have high default and maturity risk premiums as a part of the pricing decision. Furthermore, an announcement of issuance will signal financial weakness to the marketplace. A longer term note can be construed as a signal of a long financial recovery and little expectation for profits in the short run. I hypothesize the longer the term to maturity, the larger the spread will be. *Impact: positive variable, negative coefficient. This will reduce the amount of the spread at issuance.*

- Issue Amount – The amount of the issue creates a direct impact on the capital structure of the firm. The smaller the issue, the less of an impact or unbalance of the firms' existing capital structure. Firms offering additional debt may run the risk of deviating from the industry norm capital structure and therefore limit their ability to compete in a competitive marketplace for their goods and services. I test the impact of the amount of the issuance by including this variable in the regression equation. I expect to find that issues of low value will impact the spread less than issues of greater value. In general, an issue amount of $200 million will have less of an impact on the firm's capital structure than an issue amount of $800 million. It is along this lines that I expect to find a positive sign in the regression equation from the impact of the issue amount and the effect it will have on the firms' capital structure. I hypothesize the higher the issue amount, the larger the spread will be. *Impact: positive variable, positive coefficient. This will increase the amount of the spread at issuance.*

- Callable – Fridson and Garman (1998) and Kalotay (1997) showed that the callability of a bond, or to retire the bond before its prescribed maturity adds value to the issue. The issuer can benefit from changes in the economic climate and take advantage of improved interest rate conditions by calling in existing bonds and reissuing new bonds at a lower rate. Similarly, a company may improve its credit standing which qualifies the firm to issue a higher rated bond which can reduce its interest payments, therefore calling higher yielding bonds. Previous academic research has shown that callable bonds is an option investors are willing to pay a premium for. I expect to find bonds that are callable will produce a positive sign in the regression equation. This is attributed to the likeliness of the issue being called reduces the risk of the issue by having a chance of the call provision being exercised. Additionally, when a bond is called, the offering price will be greater than its face value due to a premium being added by issuers to encourage investor sellback. I hypothesize that callable bonds will have a larger spread than non-callable bonds. *Impact: positive variable, positive coefficient. This will increase the amount of the spread at issuance.*

- Use of Proceeds – Tests whether the use of proceeds regressed on the company specific variables impacts the pricing of the bond are completed. Fridson and Jonsson (1995) show the intended

use of proceeds by floating a new issue of high-yield debt has an impact on the yield-spread of the issue. Companies are required at the time of registration of a new issue to report to the Securities and Exchange Commission the intend use of proceeds from the issue. I categorize each bond rating classification into dummy variables grouping at the respective use of proceeds as reported by the issuing firm. I believe this variable will create a negative sign in the regression equation due to the fact that firms' issuing this type of debt do not have access to traditional capital markets and may be in a distressed position. These classifications include bonds issued for; acquisition, general purposes, payments on borrowings, refinancing activity and other uses. Of these classifications, only the first four classifications will have results as the other uses classification will be lost in the regression. However, I expect to find that firms raising capital for the purposes of acquisitions to experience a less of a negative reaction than firms raising capital for general purposes, payments on borrowing and refinancing activity. The pricing of the issue will have to compensate the investor less for firms that raise capital for expansion and new projects in comparison to firms that are facing a distressed position and issue high-yield debt to solve internal capital problems. I hypothesize the more debt issued for general purposes, payments and refinancing activity rather than mergers and acquisitions, the larger the spread will be. *Impact: positive variable, negative coefficient. This will decrease the amount of the spread at issuance.*

- Rating – The regression analysis features the Standard and Poor's (S&P) rating over the Moody's rating in the analysis. However, both provide virtually the same end results. The rating agencies are given the responsibility of providing a rating for a new issuance in correlation to the risk of the bond. A bond with a high rating is expected to have a relatively lower spread above the prevailing treasury rate in comparison to a bond with a low rating. The bonds used in this chapter are of S&P ratings BBB, BB and B, CCC and not listed. Bonds with a rating of "CC" or lower were not evaluated due incomplete information in the databases selected. I categorize each bond rating classification into dummy variables, grouping at the respective rating letter, but ignoring pluses and minuses.[34] In general, the spread at issuance is expected to compensate investors with higher risk premiums for bonds of lower credit rating.

[34] The dummy variable categories for all variables categorized as dummy variables are featured in Figure 2.

However, bonds of lower rating have a higher risk of default than their higher rated counterparts. I expect to find mixed results as to the sign of the intercept. Bonds near investment grade (BBB and BB) will exhibit a negative coefficient value lowers the spread which in turn lowers the value. Given this rationale, bonds of BBB credit grade will exhibit a more negative coefficient than bonds of BB rating. Bonds with a rating of B and CCC will display a positive coefficient which will increase the spread. Following the above logic, bonds of B rating will have a less negative coefficient value than bonds of CCC rating. I hypothesize the lower the rating, the larger the spread will be. *Impact (Bonds of BBB and BB rating): positive variable, negative coefficient. This will reduce the amount of the spread at issuance. Impact (Bonds of B and CCC rating): positive variable, positive coefficient. This will increase the amount of the spread at issuance.*

- Exchange – The primary exchange in which each bond issuing firm is selected for classification. The four markets used are the American Stock Exchange (AMEX), the NASDAQ exchange and the New York Stock Exchange (NYSE) and the Over-the-Counter (OTC) market. Prior academic research has shown that older and more established companies participate in the AMEX and NYSE exchanges while newer and high-technology companies participate in the NASDAQ market. Small, young, struggling, or falling firms are generally traded in the OTC market. Gilson and Warner (1995) show that bond issuing firms that participate in the NASDAQ exchange experience higher costs of issuance. I categorize each market into dummy variables in the regression to capture whether the marketplace in where the issuer's equity trades is a factor over the spread of the issue. I categorize each bond rating classification into dummy variables grouping at the respective exchange where the firms' equity is issued. These classifications include the AMEX, NASDAQ, NYSE, the over-the counter market and bond of no rating[35]. Of these classifications, only the first four classifications will have results as the bonds of no rating classification will be lost in the regression. I expect to see a negative impact on the spread of the issue by the exchange variable for firms participating in the AMEX, NYSE and NASDAQ. This is attributed to the accessibility of the markets and the ease of information of firms that participate in these marketplaces. In contrast, I expect to find a positive or increased spread for firms trading in the OTC marketplace, due to the limited volume of trading of it shares and limited information. I also expect to find firms whose equity

[35] Bonds of no rating are bond originally issued by a firm that had outstanding equity but now have been delisted.

trades in the NYSE and NASDAQ markets to impact the spread less than AMEX firms given that the NYSE and AMEX is generally comprised of more established firms. Investors adding high-yield debt to their portfolios purchase this type of security with the intention of the firm performing at minimum level consistent with the industry or above. A firm performing below industry level in a competitive market will not have the desired profitability level which will reflect in poor performance of it outstanding equity. Firms performing above their industry standard will create a sense of optimism in the investment community. This will reflect as such in their equity prices in the marketplace. (I believe the pricing decision will reflect the liquidity of the firm's other debt and equity offerings and the pricing decision is partly based on this rationale.) I hypothesize the more inferior the exchange, the larger the spread will be. *Impact (Equity traded on the AMEX, NYSE and NASDAQ): positive variable, negative coefficient. This will reduce the amount of the spread at issuance. Impact (Equity traded on the OTC market): positive variable, positive coefficient. This will increase the amount of the spread at issuance.*

- Market Conditions - Historically investors prefer equity investments when the stock markets are increasing in value and prefer debt instruments when the market takes a downturn. Fridson and Garman (1998) show high-yield debt has characteristics that resemble an equity security where both are sensitive to market conditions. A positive economic climate (bull market) will lead to increased corporate profits, rising equity prices and growing cash flows. These three factors will generally decrease default risk, which in turn will create investor demand and spark price appreciation creating a higher return. During recessionary periods (markets), these relationships are the opposite. I use a dummy variable in the regression equation to represent market conditions. Market conditions are categorized by evaluating the closing price of the NYSE and NASDAQ to capture whether a given year provided a gain or loss in value. high-yield debt issuances are categorized by the year of issuance. Following the prior research of Fridson and Garman (1998), I expect to find high-yield bonds issued in years of increasing stock market returns (bull markets) will have a negative coefficient in the regression equation. This will cause the spread to decrease in value. I hypothesize bonds issued in declining (bear) markets will have a larger spread than bonds issued in increasing (bull) markets. *Impact: positive variable, negative coefficient. This will decrease the amount of the spread at issuance.*

- Age at Issuance – The age of the firm at issuance is tested for any significant effects over the spread at issuance. Older, more established firms should present a more stable investment opportunity than younger firms. Firms that are established over the long-term will have better information as to business trends and their respective place within their industry, and the overall marketplace compared to younger firms. Investors also have more historical information to evaluate the firm and better knowledge of firm performance given a longer history of operations for the older firms. I separate the data into two dummy variables. One identifies firms that are less than 5 years old and the other firms that are older than 5 years old. I expect to firms that are 5 years old or younger will exhibit a positive coefficient in the regression equation. This will increase the spread at issuance compensating bond investors for the additional risk of investing in a young firm. I hypothesize the younger the issuing firm at issuance, the larger the spread will be. *Impact: positive variable, positive coefficient. This will increase the amount of the spread at issuance.*

- First-Time Issuers – A firm's announcement of an issuance of high-yield debt has historically been viewed as a negative signal from management. A firms' initial announcement of a high-yield bond IBO has had a negative impact over the price of the announcing firms' equity. In the case of bond pricing, I expect to find a firm issuing a high-yield debt instrument for the first time will actually have a lower or negative impact on the spread at issuance. Investors are wishing to be compensated greater for firms that have several or subsequent offerings and will accept lower spreads on high-yield debt IBO's. I use a dummy variable to represent first-time issuers in the regression. I expect to find the coefficient of the variable to have a negative sign in the regression equation therefore lowering the amount of the spread at issuance. I hypothesize that when the issuing firm is not a first-time issuer, the larger the spread will be. *Impact: positive variable, negative coefficient. This will reduce the amount of the spread at issuance.*

The regression equation after accounting for the impact of the bond characteristics is represented below:

$$\begin{aligned} spread &= a_0 + a_1(\overset{+}{coupon}) + a_2(\overset{-}{length}) + a_3(\overset{+}{amount\ of\ issue}) \\ &+ a_4(\overset{+}{callable}) + a_5(\overset{-}{use\ of\ proceeds}) + a_6(\overset{+\backslash -}{rating}) + a_7(\overset{+}{exchange}) \\ &+ a_8(\overset{-}{market\ conditions}) + a_9(\overset{+}{age\ of\ firm}) + a_{10}(\overset{-}{1st\ time\ issuer}) + w_i \end{aligned} \tag{11}$$

where α_0 is the intercept and w_i is the disturbance term. The sign above the intercept terms represents the sign of the intercept as a result of the regression. The sign above the variable represents the sign of the variable in the database

Each new issuance identified in the SDC database with complete information is matched in the Compustat database to select variables of firm performance. These financial statements from Compustat are used to grasp the position of a firm at a given point in time and can be used as a predictor of future earnings and dividends. It is along these lines I have selected firm specific ratios to explain the spread at issuance against the prevailing Treasury rate that surrounds an issuance of high-yield debt. I test ratios of liquidity, asset management, debt management and profitability to complete a series of cross sectional analysis. These ratios will also be normalized[36] at the industry level to account for any industry effects. The following ratios will be used in the regression equation:

- Ratio of Liquidity - the current ratio will be used to capture the firms' liquid assets or how easily the assets of the firm can be converted to cash at fair market value. This measures whether a firm can meet its current obligations. The current ratio is calculated by dividing the firms' current assets by it current liabilities. Current assets include cash, marketable securities, accounts receivables, inventories and marketable securities. Current liabilities include accounts payable, accrued income taxes, short-term notes payable, current maturity of long-term debt and various accrued expenses such as wages and salaries due. Previous literature reveals that firms which issue high-yield debt are cash strapped, or have no access to traditional financing methods. In the regression equation I expect to find the normalized current ratio will reveal a positive sign. Firms issuing high-yield debt are increasing their current liabilities;

[36] Normalization will take place by identifying the issuances of high-yield debt by SIC code at the 1000 level. Each ratio in the analysis will be grouped by SIC code then divided by the industry average for the given ratio in the year of the issuance. After normalization, the new ratio will be employed in the cross-sectional regressions.

however, issuing firms will increase their current assets greater than the increase to current liabilities. Current assets will increase from the infusion of cash from the sale of the debt instruments, while the current liabilities will only increase by the amount of the interest payments until the year of maturity. This will result in an improved current ratio. Consequently, the current ratio used in the analysis is the current ratio at the time of issuance normalized against the industry average. However, an improved current ratio will take place after the issuance and the ability of the firm to repay the bond is based on it future outlook. Firms with a high normalized current ratio at the time issuance signals a firm may not need the excess cash generated by the issuance. I hypothesize the higher the firms' current ratio, the smaller the spread will be. *Sign of the normalized ratio: positive; Impact: positive variable, negative coefficient. This will decrease the amount of the spread at issuance.*

- Ratio of Asset Management – an asset management ratio is selected to capture how effectively management is managing the assets of the firm. Poor asset management proves to be unproductive since excess inventory represents inefficient investment, albeit with tangible goods, accounting for low or even zero rates of return. The total asset turnover ratio captures how effectively management oversees its assets and is derived by dividing sales by total assets. The sign of both the total asset turnover and the normalized total asset turnover ratios is positive since sales and total assets do not have negative values. Firms issuing high-yield debt should be cash strapped in part due to poor asset management. The regression results will show the normalized total assets turnover ratio will have a negative coefficient value thus lowering the spread at issuance. I hypothesize the lower the firms' total asset turnover ratio, the larger the spread will be. *Sign of the normalized ratio: positive; Impact: positive variable, negative coefficient. This will decrease the amount of the spread at issuance.*

- Ratio of Profitability – a ratio representing profitability or the profit margin will be used to capture the end result of management's policies and decisions. The basic earnings power ratio will be used to capture the profitability of the firm. This ratio is calculated by dividing the firms' EBIT by its total assets. Using EBIT will capture the earnings of the firm before the effects of interest and taxes. The expected sign of the normalized ratio is positive because many firms issue high-yield debt to ward off a distress

event. That will present a negative or a slightly positive basic earning power ratio. I expect this will have a positive impact on the determination of the spread above the prevailing Treasury rate. Investors purchase high-yield debt on the likelihood of future profitability. Bond investors take into account the potential earnings of the firm and will reflect a sense of optimism that the earnings of the firm are expected to increase after the issuance. However, the effect of the capital infusion to the firm is unknown at the announcement of an issuance; investor optimism will be overshadowed by potential profitability loss, and create a punishing effect on the firms equity. I hypothesize the lower the firms' basic earnings power ratio, the larger the spread will be. *Sign of the normalized ratio: positive; Impact: positive variable, negative coefficient. This will decrease the amount of the spread at issuance.*

- Ratio of Debt Management – a debt management ratio will be used to determine to which extent firms are using debt financing. The debt management ratio is derivated by dividing the total debt of the firm by their total assets. Total assets are measured by the summation of the firms' current and fixed assets while total debt includes both current liabilities and total long-term debt. The expected sign of the normalized ratio is positive albeit lower than firms that use investment grade debt in its capital structure. I expect to find lower total assets and higher total liabilities for firms that issue high-yield debt due to the lack of cash for investment opportunities or issuances for operating capital. These are two main reasons a firm will pursue issuances of non-investment grade debt. In addition, high-yield debt is more expensive than investment grade debt; this will also have impact on the debt management ratio. An increase in the firms' debt management ratio will also provide a positive variable in determining the spread. Reducing the liquidity of the firm, potential changes in capital structure and possible hampering of the ability of the firm to compete in a competitive marketplace causes this variable to be of a positive nature. I hypothesize the higher the firms' debt management ratio, the larger the spread will be. *Sign of the normalized ratio: positive; Impact: positive variable, positive coefficient. This will increase the amount of the spread at issuance.*

This series of cross-sectional regressions features an ordinary least squares regression technique and will be conducted using the normalized accounting ratios identified above. The dependent

variable in the regression will be the spread at issuance, while the independent variables will be the bond characteristics, as well as the normalized ratios of financial performance. All variables of firm performance are extracted from the Compustat database and are representative of the year the high-yield debt issuance is announced. The regression equation[37] will be:

$$\begin{aligned} spread &= a_0^{+} + a_1^{+}(coupon) + a_2^{-}(length) + a_3^{+}(amount\ of\ issue) \\ &+ a_4^{+}(callable) + a_5^{-}(use\ of\ proceeds) + a_6^{+\backslash -}(rating) + a_7^{+}(exchange) \\ &+ a_8^{-}(market\ conditions) + a_9^{+}(age\ of\ firm) + a_{10}^{-}(1st\ time\ issuer) \\ &+ a_{11}^{+}(ncurrent) + a_{12}^{-}(ntotal\ asset\ turnover) + a_{13}^{-}(nbasic\ earnings\ power) \\ &+ a_{14}^{+}(ndebt) + w_i \end{aligned} \tag{12}$$

where α_0 is the intercept and w_i is the disturbance term. The sign above the intercept terms represents the sign of the intercept as a result of the regression. The sign above the variable represents the sign of the variable in the database

The intent to this line of testing is to determine whether high-yield debt is being issued by firms of poor or declining performance surrounding an announcement of an issuance. Investors and analysts rely on financial ratios to help predict future earnings and dividends. Similarly, these ratios will prove to be useful in determining the spread that surrounds an issuance of high-yield debt. The ratios used will be normalized at the general industry level (1000 SIC code level) to capture any industry effects across the data.

The final regression test will include categorizing the bonds by their respective industry classification to capture any industry effects that may be prevalent with issuing debt. Current trends in debt issuances reveal that small, young firms and firms that are technology based rely on debt more heavily than older and more established firms. Analysis into this trend will reveal whether various high-yield debt issuers grouped by industry enjoy the same pricing decision with respect to spread against the prevailing Treasury rate. Tests of cross sectionality will reveal whether bond or firm characteristics are

[37] The expected sign of the intercept is represented in the equation. The sign above the variables represents the expected sign of the variable.

indicators in the pricing decision at issuance. Cross-sectional analysis will be conducted at the industry level (1000 SIC Code level) in the same manner as the previous section with one exception. The ratios used to measure liquidity, asset management, debt management and profitability will not be normalized due to the issuing firms being categorized at the 1000 SIC code level. The contribution factor is to determine whether one industry compensates bond investors more for a new issuance of high-yield debt and whether the industry the firm participates in is a contributing factor. I hypothesize that younger, less established the industry is at issuance, the larger the spread will be. *Impact: positive variable, negative coefficient. This will decrease the amount of the spread at issuance.*

The regression equation is as such:

$$\begin{aligned} spread &= a_0 + a_1(\overset{+}{coupon}) + a_2(\overset{-}{length}) + a_3(\overset{+}{amount\ of\ issue}) \\ &+ a_4(\overset{+}{callable}) + a_5(\overset{-}{use\ of\ proceeds}) + a_6(\overset{+\backslash -}{rating}) + a_7(\overset{+\backslash -}{exchange}) \\ &+ a_8(\overset{+}{market\ conditions}) + a_9(\overset{-}{age\ of\ firm}) + a_{10}(\overset{+}{1st\ time\ issuer}) \\ &+ a_{11}(\overset{+}{ncurrent}) + a_{12}(\overset{-}{ntotal\ asset\ turnover}) + a_{13}(\overset{+}{nbasic\ earnings\ power}) \\ &+ a_{14}(\overset{+}{ndebt}) + a_{15}(sic\ code) + w_i \end{aligned} \tag{13}$$

where α_0 is the intercept and w_i is the disturbance term. The sign above the intercept terms represents the sign of the intercept as a result of the regression. The sign above the variable represents the sign of the variable in the database

3.4 Evaluation and Testing

This chapter analyzes data from 1985-2003 as the observation period and employs both the Securities and Data Corporation (SDC) database to identify high-yield issuances and bond characteristics, while the Compustat database is used to obtain company specific variables for firms that issued high-yield debt over the observation period. In order for an observation to be included in the analysis, each issuance needed complete information for the variables identified in Figure 2. By identifying the characteristics that make-up the spread over the prevailing treasury rate at issuance for a high-yield debt offering, it can be better understood how the pricing decisions are completed. Section 5 will provide the descriptive statistics for the sample used and provide results of the regression equations listed in the previous section.

3.4.1 Descriptive Statistics

The first table in this series (table 10) shows the distribution of the sample with respect to the year of issuance, the number of high-yield bonds issued in a particular year, the average amount of an issuance, the aggregate amount for the year issued and the equity exchange the issuing firms participates in. The overall sample is comprised of 703 issues that had complete information over the variables tested. The number of issues per year in the database varies from 101 in 1986 to 1 issuance in 2000 with a sample average 37 issues per year. The average amount of the issuances varied from a low of $69.1 million in 1985 to a high of $446.6 million in 2003.[38] The overall average for issuance per year equals $218.9 million with an aggregate dollar amount of the sample just over $192.5 billion. Along with the monetary distribution of the sample, Table 10 separates the data into the exchange where the firms' equity trades. Firms participating the NYSE account for 45.52% of the sample or 320 observations. The NASDAQ is the second most prevalent marketplace represented in the sample with 22.62% share or 159 issuances. The exchange not listed category, which generally represents firms that are now delisted, has 147 observations in the sample or 20.91%. The final two exchanges noted are the AMEX and the OTC

[38] The year 2000 is excluded from this statement due to only one issuance used in the dataset.

markets. These two combined represent 8.68% and 2.28% of the sample or 61 and 16 issuances respectfully.

Table 10
Market Distribution of High-Yield Debt Issues 1985-2003

This table presents the market distribution of the entire sample for the issuing period between 1985-2003. The sample is categorized by the year of the issuance, the number of issuances pre year, the total amount issued in the bond market and the equity market in which the issuing firm participates.

Year	Number	Average per Issuance	Total Proceeds	NYSE	NASDAQ	OTC	Amex	Exchange Not Listed
1985	34	$69.1	$2,348.6	10	11	1	7	5
1986	101	$73.9	$7,466.0	43	28	4	19	7
1987	71	$126.9	$9,008.2	20	23	4	6	18
1988	19	$203.2	$3,861.7	4	3	0	2	10
1989	26	$211.4	$5,496.1	6	0	0	6	14
1990	2	$224.5	$449.0	2	0	0	0	0
1991	11	$236.5	$2,601.3	10	0	0	0	1
1992	63	$160.8	$10,127.9	42	4	2	1	14
1993	90	$144.6	$13,014.2	33	14	0	5	38
1994	45	$185.4	$84,166.6	20	9	0	4	12
1995	50	$183.2	$9,161.6	23	12	3	2	10
1996	70	$174.3	$12,198.4	35	20	2	5	8
1997	37	$272.4	$10,079.1	15	14	0	2	6
1998	32	$225.8	$7,224.6	19	10	0	0	3
1999	11	$270.5	$2,976.0	7	4	0	0	0
2000	1	$500.0	$500.0	0	1	0	0	0
2001	12	$324.9	$3,898.4	11	0	0	1	0
2002	14	$234.6	$3,284.7	10	3	0	0	1
2003	14	$336.6	$4,712.0	10	3	0	1	0
Totals	703	$218.9	$192,574.4	320	159	16	61	147
% of Issue		(millions)	(millions)	45.52%	22.62%	2.28%	8.68%	20.91%

Table 11 lists the distribution of the sample by the intended use of proceeds. When filing with the Securities and Exchange Commission for registration of an issuance, each firm is required to list the intended use of the proceeds from the issuance. The use of proceeds will be tested in the regression equation to reveal whether the use of proceeds is a dependent variable in determining the spread at issuance. All issuances are categorized in the dataset by their intended use. Table 11 shows that of the 703 issuance that make up the dataset, 386 or 54.91% were issued to retire or refinance prior debt. Second in this list are bonds issued for general purposes. This classification does not reveal how the firms intend to use the proceeds and provides little insight into the rationale for the issuance. This group is

represented with 169 issuances or 24.04% of the dataset. The third most popular use of proceeds in the dataset is for other purposes, being represented with 88 instances or 12.52%.[39] The last two categories include bonds issued for Acquisition Financing and Payments on Borrowings.[40] The two classifications have 44 and 20 issuances or 6.26% and 2.84% of the sample respectively.

Table 11
Distribution of High-Yield Debt Issues by Use of Proceeds

This table presents the market distribution of the entire sample for the issuing period between 1985-2003. The sample is categorized by the specified or intended use of the issuance as reported to the SEC. The sample is highlighted by year of the issuance and the reported use of proceeds.

Year	Acq Financing	General Purposes	Payment on Borrowings	Retire of Refinance Debt	Other*	Total Issue
1985	2	12	0	20	0	34
1986	8	22	0	62	9	101
1987	4	18	0	33	16	71
1988	0	1	0	15	3	19
1989	4	0	0	18	4	26
1990	0	0	0	2	0	2
1991	0	1	0	9	1	11
1992	2	9	0	49	3	63
1993	3	24	0	54	9	90
1994	2	5	0	33	5	45
1995	2	12	1	25	10	50
1996	10	20	0	38	2	70
1997	1	14	4	5	13	37
1998	3	8	6	8	7	32
1999	2	4	1	3	1	11
2000	0	1	0	0	0	1
2001	1	8	0	2	1	12
2002	0	10	1	3	0	14
2003	0	0	7	7	0	14
Totals	44	169	20	386	88	703
% of Issue	6.26%	24.04%	2.84%	54.91%	12.52%	

*Other Includes: Stock Repurchases, Securities Acquisition, Investment in Affiliates, Project Financing, Capital Expenditures, Capital Investment Funds, Working Capital, Capital Acquisition, Investment in Other Companies.

[39] Other uses of proceeds includes: Stock Repurchases, Securities Acquisition, Investment in Affiliates, Project Financing, Capital Expenditures, Capital Investment Funds, Working Capital, Capital Acquisition, and Investment in Other Companies.
[40] Payments on borrowing are generally short-term notes and do not include debt issuance or bank financing issued for more than one year.

The credit grade or rating of the issue has been proven to be a determinant of the spread for debt issuance. This is based upon the premise that the higher the rating of the issue, the lower the spread. Bonds of higher credit grade do not have to compensate their investors as much as lower credit grade issues given the rating is a direct reflection upon the riskiness of the issue. Table 12 shows the S&P rating of the issues used in the dataset with bonds of BBB being closest to becoming investment grade followed by bonds of BB, B and CCC rating. The table also lists bonds that have no rating. Bonds of no rating do not any information as to the riskiness of the issue, nor the anticipated spread[41]. Bonds of a B rating are most representative in the dataset with 382 issues or 54.47%. The second most prevalent rating is bonds of BB

Table 12
S&P Rating of the Issuance

This table presents the distribution of the entire sample for the issuing period 1985-2003 identifying the issuances by their Standard & Poor's rating as well as the year of issuance. Panel A represents the number of issues in a given year categorized by the rating of the issue. Value represents the amount of the issuance categorized by aggregate amounts.

\Number of Issues						
Year	BBB	BB	B	CCC	NR	Total
1985	0	6	21	1	6	34
1986	4	8	58	11	20	101
1987	2	16	38	7	8	71
1988	0	2	11	6	0	19
1989	1	3	21	1	0	26
1990	0	1	1	0	0	2
1991	4	5	2	0	0	11
1992	6	13	44	0	0	63
1993	5	28	54	1	2	90
1994	4	10	29	1	1	45
1995	9	16	21	1	3	50
1996	4	28	33	0	5	70
1997	5	15	13	0	4	37
1998	3	11	17	0	1	32
1999	2	4	5	0	0	11
2000	0	0	1	0	0	1
2001	2	9	1	0	0	12
2002	4	4	6	0	0	14
2003	4	3	6	0	1	14
Total	59	182	382	29	51	703
% of Issue	8.43%	26.00%	54.57%	4.14%	7.29%	

[41] The SDC database has an identification variable for bonds of high-yield.

rating with 182 instances in the sample or 26.00%. The final three classifications each have less are the three least represented in the dataset with 59, 51 and 29 issuances or 8.43%, 7.29% and 4.14% respectively.

Understanding how the spread at issuance is determined is the motivation for this line of research. Table 13 lists the average spread over the sample period as well as the average coupon amounts, and the length of issue for the sample set. Over the observation period 1985-2003, the average spread is 344.45 basis points. However this number reaches its peak in the sample in 1989 at an average of 520.38 basis points and an average low of 227.76 basis points in 1997 for years with at least 10 bonds

Table 13
Average Bond Characteristics

This table presents the average distribution of the entire sample for the coupon amount, spread over the prevailing treasury rate at time of issuance and the years to maturity of the issuance for the sample period 1985-2003.

Year	Number of Issuances	Coupon Amount (percentage)	Spread (basis points)	Years to Maturity (years)
1985	34	11.00	303.35	15.41
1986	101	9.21	290.07	16.67
1987	71	9.77	299.75	16.55
1988	19	13.36	457.74	10.21
1989	26	13.33	520.38	10.15
1990	2	10.19	197.50	5.50
1991	11	10.54	312.27	10.73
1992	63	10.06	341.35	10.00
1993	90	9.41	383.79	10.93
1994	45	10.21	360.53	9.89
1995	50	9.35	327.96	8.08
1996	70	9.16	296.50	9.89
1997	37	7.98	227.76	9.68
1998	32	7.67	295.69	10.53
1999	11	8.79	324.73	5.18
2000	1	10.75	467.00	11.00
2001	12	8.37	380.17	6.83
2002	14	8.31	380.93	9.43
2003	14	7.28	377.14	9.36
Averages	37	9.72	344.45	10.32

issued. The average coupon amount over the sample is also featured in Table 13 and reveals an average coupon amount of 9.72% of par value, or $92.72 per year for a $1000 par bond. The year of the highest average coupon payment is 1988 at 13.36% with the lowest average coupon payment year being 2003 with a rate of 7.28%. The last column in the table reveals the average years to maturity. The average years to maturity for bonds used in the sample is 10.21 years with 1986 being the year with the longest average of 16.67 years, while bonds issued in 1999 have the shortest average length to maturity at 5.18 years.

Identifying callable bonds, age of the firm and the first-time issuers at issuance is done in Table 14. One trait associated with bonds of less than investment grade rating is their high-yields and coupons compared to their investment grade counterparts. Bond ratings can very over the life of the issuance dependent upon the actions of the firm. Firms anticipating improvements in their credit ratings to investment grade status should issue debt that is callable. This will allow the issuing firm to take advantage of any improvement in their credit rating which will lower coupon payments From the sample of 703, over 79% or 558 issuances are callable leaving a little less than 21% or 1435 issues as non-callable. It is believed issuing firms will pay a premium when issuing callable bonds. This rationale will be tested in the cross-sectional regression tests. A second variable highlighted in Table 14 is the age of the firm at issuance. I have split this characteristic into two categories; firm less than 5 years old at issuance and firms over 5 years old. The database has 298 firms that are less than 5 years old and 405 firms older than 5 years old at issuance. This breaks down to 42.39% of issuing firm being young and 57.61% being more mature. The final variable featured in table 14 is whether the firm is a first-time issuer. The sample is compiled of 366 issuances (52.06%) by firms issuing for the first time with the other 337 issuances being issued by firms that have previously issued high-yield debt.[42]

The final table highlighting the descriptive statistics is Table 15. This table features the distribution of the sample, highlighting the SIC code of the industry in which the firm participates. Firms in the dataset are identified by their SIC code at the 1000 level. Appendix A provides a complete list of SIC Codes as

42 A firm is classified as a first-time issuer only when issuing a high-yield bond for the first time. Subsequent offerings by firm are classified as not a first time issuer.

Table 14
Various Firm and Bond Specific Characteristics

This table presents the distribution of the entire sample for the issuing period between 1985-2003 identifying the issuing firms if they are a first time issuer of high-yield debt, the ages of the firm at issuance and whether the bond is callable or non-callable in nature

	Callable		Age at Issuance		First-Time Issuer	
	Non		Less than	Greater than		
SIC	Callable	Callable	5 years	5 years	Yes	No
			less 5			
1985	12	22	17	17	23	11
1986	51	50	48	53	67	34
1987	32	39	37	34	54	17
1988	0	19	8	11	11	8
1989	0	26	11	15	15	11
1990	0	2	0	2	1	1
1991	0	11	5	6	2	9
1992	0	63	18	45	20	43
1993	0	90	20	70	34	56
1994	0	45	16	29	25	20
1995	1	49	24	26	27	23
1996	10	60	35	35	37	33
1997	10	27	24	13	17	20
1998	7	25	19	13	14	18
1999	1	10	5	6	4	7
2000	0	1	1	0	1	0
2001	10	2	5	7	4	8
2002	6	8	3	11	6	8
2003	5	9	2	12	4	10
Totals	145	558	298	405	366	337
% of Issue	20.63%	79.37%	42.39%	57.61%	52.06%	47.94%

listed by the United States Occupation and Health Safety Administration. The dataset is dominated by issuance by firms in 4 industry classifications. Firms in the 2000, 3000, 4000 and 5000 SIC codes represent 75.38% of the database. Firms with an SIC code of 3000 and 4000 each have 162 observations (23.04% share each) in the sample while 2000 and 5000 SIC code firms each have 103 observations (14.65% share each) in the database. Firms with an SIC code of 2000 and 3000 represent the various types of manufacturing firms. 4000 SIC code firms include the transportation, communications, electric, gas, and sanitary services sectors while firms of 5000 SIC code include the retail trade industry. The lesser represented include firms with an SIC codes of 1000, 7000, 8000 and 6000 with 66 (9.39%), 50 (7.11%), 44 (6.26%) and 13 (1.85%) respectively. Firms in the 1000 SIC code

classification include Mining and Construction companies. Firms designated with a 7000 or 8000 SIC code participate in the service industry while the 6000 SIC code companies include firms that primarily deal in finance, insurance and real estate activity.

Table 15
SIC Distribution of High-Yield Debt Issuances

This table presents the market distribution of the entire sample for the issuing period between 1985-2003 identifying the issuing firms by their Standard Industry Classification as well as the year of issuance. Panel A represents the number of issues in a given year with respect to the SIC code of the issuing firm. Panel B list the aggregate amount of the issue taking into account the year of issuance and the SIC code.

SIC	1000	2000	3000	4000	5000	6000	7000	8000	Total Issue
1985	0	4	13	9	2	3	0	3	34
1986	4	14	30	9	20	5	12	7	101
1987	3	12	26	13	12	0	5	0	71
1988	2	0	6	3	6	1	1	0	19
1989	3	8	5	5	5	0	0	0	26
1990	0	1	0	0	1	0	0	0	2
1991	4	3	4	0	0	0	0	0	11
1992	5	11	18	10	15	1	0	3	63
1993	4	17	13	26	16	2	4	8	90
1994	6	9	11	11	4	0	3	1	45
1995	9	7	7	14	4	0	5	4	50
1996	8	8	10	26	5	0	8	5	70
1997	7	1	5	14	3	0	2	5	37
1998	5	2	7	9	3	1	5	0	32
1999	2	2	1	4	1	0	1	0	11
2000	0	0	0	1	0	0	0	0	1
2001	2	2	1	2	2	0	1	2	12
2002	2	2	1	2	3	0	2	2	14
2003	0	0	4	4	1	0	1	4	14
Totals	66	103	162	162	103	13	50	44	703
	9.39%	14.65%	23.04%	23.04%	14.65%	1.85%	7.11%	6.26%	

3.4.2 Regression Results – General Sample

The first in the series of regressions features the spread above the prevailing treasury rate at issuance as the dependent variable and tests several explanatory variables which include: the coupon amount, the years to maturity of the issuance, the amount of the issuance, whether the issuance is callable or not, the intended use of the proceeds from the issue, the S&P rating of the issue,

the exchange where the issuing firms' equity trades, whether the equity market is in a bull or bear state at the time of issuance, the age of the firm at issuance and whether the firm is a first time issuer of high-yield debt. Panel A of Table 16 reveals the results of the regression featuring Equation 11 from page 68. The regression test shows that the coupon amount is statistically significant in determining the spread and has a positive coefficient value (20.4981). This will cause the coupon to add value to the spread. Higher coupon amounts will have more of an impact on the spread than lower coupon amounts. This evidence supports the hypothesis the higher the coupon amount, the larger the spread will be. The length of the issue also is found to be statistically significant in spread determination. The length of the issue has a negative coefficient value (-3.1310). This means the longer a bond is issued, the more negative impact (reduce) it will have on the spread. This evidence supports the hypothesis stating the longer the term to maturity, the larger the spread. It has been noted throughout academic research that firms should be willing to compensate investors for bonds that are issued with a call feature. I find this relationship to hold true as bonds with a call feature do have statistical significance over the spread. The impact of callable bonds is positive which in turn will increase the spread of a new issuance. This evidence supports the hypothesis that callable bonds will have a greater spread than non-callable bonds. The rating of the issue is also documented to be a determinant of the spread, i.e. the lower the rating of the issue, the higher the compensation investors expect to hold it. All four bond categories tested are found to be a statistically significant determinate over the spread. The impact of each rating follows the rationale of investors a higher return to hold a bond of lower rating. Bonds of BBB and BB have a negative coefficient in the regression results which will lower the value of the spread. Bonds of BBB have an intercept value of -80.7854 while bonds of BB have an intercept value of -19.7182, meaning bonds of BBB rating have more an impact over the spread than bonds of BB. Bonds with a rating of B and CCC are found to be significant and have a positive coefficient value (67.8019 and 89.3606). These bonds will increase the value of the spread with bonds of CCC have the most impact. This evidence supports the hypothesis the lower the credit rating, the larger the spread will be.

The exchange in which the issuing firm's equity trades is tested for significance over the spread and found to have mixed results. Significance is found in the NYSE and the NASDAQ market. Both the

NYSE and the NASDAQ have a significant negative coefficient value (-49.4152 and -31.4580) which in turn will lower the amount of the spread at issuance. The AMEX also experiences a negative coefficient value, but is found not to be of significance. The OTC market is found to have a positive impact over the spread but like the AMEX market it is not found to be significant. The mixed results and the changing relationships within the values of the intercept do not support the hypothesis the more inferior the market, the larger the spread. The final test variable found to be significant in this series of test is whether the market is in a bull or bear state. The results of the regression shows that bull markets are significant in determining the spread. It is found that bull markets will lower the spread with a coefficient value of -129.8820. The test results support the hypothesis stating that bonds issued in bear markets will have a larger spread than bonds issued in bull markets.

The amount of the issue is found to have a positive impact on the spread however it is not statistically significant. This is consistent with the hypothesis the higher the issue amount, the larger the spread. The use of the proceeds variables have a negative impact over the spread, but only found to have significance for refinancing activity. However, the evidence does support the hypothesis the more debt issued for general purposes, payments and refinancing activities rather than mergers\acquisitions, the greater the spread will be. It is also found that the age of the firm and whether the firm is a first time issuer of high-yield debt are not of significance in determining the spread. The hypotheses stating that younger firms and non first-time issuers will experience higher spreads than older, more established and first-time issuers is supported in the test results. However, the issue amount, use of proceeds, age of the firm and first-time issuer variables are found not to be significant determinants of the spread. The R^2 value of the regression is 50.10% with an adjusted R^2 of 48.71.

Panel B of Table 16 shows the results of the regression with the inclusion of ratios of firm performance (Equation #12). Analysts and investors rely on accounting information and financial ratios to help predict future earnings and dividends for publicly traded firms. It is along these lines to test various ratios of performance to determine whether they are significant in determining the spread. The second

regression reveals the same relationships over the variables identified in the previous section[43] with one inclusion. Firms issuing high-yield debt for refinancing purposes under the use of proceeds category is found to be a significant variable at the 95% level. This variable has a negative coefficient value which in turn will lower the value of the spread. In the previous test, refinancing was not found to be significant variable, however, it would hold at the 94% level.

Four ratios of firm performance are tested for significance in determining the spread. This series of tests feature normalized ratios of performance to eliminate any industry effects in the data. The current and the debt management ratio are both found to have a positive coefficient value (increase the spread), but are not found to be significant variables. The positive value of the intercept does support the hypotheses stating the higher the value of the debt management ratio, the larger the spread. However, the positive value of the intercept does not support the hypotheses the higher the value of the current ratio, the smaller the spread. One possible explanation for this may be stockholders do not anticipate a firm with good current ratio to be issuing high-yield bonds. Further tests will have to be completed to fully understand this relationship. The total assets turnover and the basic earning power ratios both have a negative coefficient value (reduce the spread) and also are found not to be significant in determining the spread at issuance. The negative value of the intercept does support the hypotheses stating the lower the value of the total asset turnover and basic earnings power ratios, the larger the spread. Although none of the ratios of firm performance are found to reveal significance at the 95% level, both the current and the total asset turnover ratios are significant at the 91% confidence level. The R^2 value or the explanatory power of the regression is 50.72% with an adjusted R^2 of 49.06.

The last regression uses Equation #13 which includes identifying the issuing firms by their industry classification or SIC code. In this test, the actual or non-normalized ratio of firm performance is used in the regression. Any industry effects will be identified by the grouping similar firms. Panel 3 of Table 16 shows the results of the tests and finds similar relationships as the other two regression

[43] The coupon amount, callable issues and two categories of the rating of the issue (BBB and BB) are found to have significance and positively (increase) the effect amount of the spread at issuance. The years to maturity, rating of the issue (B and CCC), NYSE and NASDAQ markets and Bear markets present a significantly negative on the spread lower its value.

Table 16

Regression Reflecting the Spread Above the Prevailing Treasury Rate of a High-Yield Bond Issuance using Bond and Firm Specific Characteristics

The ordinary least squares cross-sectional regression of the spread at issuance is tested against a variety of bond and firm characteristics. The coupon amount used is the actual coupon amount expressed as a percentage of the par value of the bond. The years to maturity of the issuance is the actual number of years the bond will be in circulation. A dummy variable is used to distinguish callable bonds. The use of proceeds is represented with dummy variables noting the issuing firms self reported use of the proceeds from the issue. The rating of the issue take dummy variable format and takes into account the issues S&P rating. The exchange in which the issuing firms equity trades at the time of issuance is also represented using dummy variables. Dummy variable are also used to identify whether the market is in a bear state, firms younger than 5 years old at issuance and 1st time issuers. Normalized ratios of firm performance are used in panel b to remove any industry effects. Non-normalized ratios of firm performance are used in panel c given the data is categorized by the firms respective industry classification. Dummy variables also represent the issuing firms SIC code. The number in parenthesis are the p-value associated with the variable results.

	Panel A	Panel B	Panel C
Test	Regression #1	Regression #2	Regression #3
Variable			
Intercept	**222.2920**	**228.8230**	**264.2110**
	[.000]	**[.000]**	**[.000]**
Coupon Amount			
Coupon Amount	**20.4981**	**20.8949**	**20.7645**
	[.000]	**[.000]**	**[.000]**
Length of Issue			
Years to Maturity	**-3.1310**	**-3.2690**	**-3.3882**
	[.000]	**[.000]**	**[.000]**
Issue Amount			
Amount of Issue	0.0113	0.0092	0.0099
	[.753]	[.797]	[.783]
Callability of the Issuance			
Callable Bond	**115.8270**	**115.6410**	**111.7910**
	[.000]	**[.000]**	**[.000]**
Use of Proceeds			
Acquisition	-2.0516	-1.9918	-2.3462
	[.932]	[.934]	[.922]
General Purposes	-17.8047	-19.1901	-20.3422
	[.303]	[.268]	[.241]
Payment on Loans	-17.3032	-21.5464	-19.6211
	[.653]	[.575]	[.610]
Refinancing	-29.7157	**-30.4003**	**-30.6222**
	[.054]	**[.049]**	**[.047]**

Table 16 continued			
Standard and Poor's' Rating of the Issue			
BBB	**-80.7854**	**-78.8736**	**-79.9898**
	[.002]	**[.003]**	**[.003]**
BB	**-19.7182**	**-17.4874**	**-21.5578**
	[.005]	**[.001]**	**[.000]**
B	**67.8019**	**68.5074**	**68.9112**
	[.001]	**[.001]**	**[.001]**
CCC	**89.3606**	**88.5955**	**90.2116**
	[.004]	**[.004]**	**[.003]**
Exchange where Firms' Equity Trades			
NYSE	**-49.4152**	**-47.9466**	**-40.6485**
	[.000]	**[.001]**	**[.005]**
NASDAQ	**-31.4580**	**-34.3891**	-30.2886
	[.046]	**[.030]**	[.057]
AMEX	-29.6088	-36.9040	-32.1209
	[.384]	[.279]	[.347]
OTC	8.4088	3.9029	7.9020
	[.676]	[.846]	[.697]
Market Conditions			
Bull Market	**-129.8820**	**-127.2530**	**-129.9440**
	[.000]	**[.000]**	**[.000]**
Age			
Firm Age at Issue	5.8240	4.5815	7.6581
	[.576]	[.661]	[.471]
Number of Issuances			
First-time Issuer	-9.2806	-8.3141	-6.5847
	[.380]	[.432]	[.534]
Ratios of Firm Performance		normalized	unnormalized
Current		4.0747	3.8102
		[.087]	[.113]
Total Asset Turnover		-9.7351	-12.8891
		[.085]	[.097]
Basic Earnings Power		-14.7965	-19.6083
		[.407]	[.278]
Debt		44.5738	41.8420
		[.236]	[.271]

Table 16 continued			
SIC Code			
1000			-40.7803
			[.305]
2000			2.5158
			[.948]
3000			-39.9846
			[.282]
4000			-18.1220
			[.626]
5000			-19.5693
			[.622]
7000			-26.5891
			[.510]
8000			-62.1878
			[.127]
R-squared	0.501014	0.507293	0.516077
Adjusted	0.487133	0.490604	0.494474
observations	703	703	703

Ratios of firm performance are normalized in the second regression and are reflect the actual ratio reported in the firms financial statements. The last regression unnormalizes the ratios of firm performance to eliminate industry effects. The SIC code of the firm is used in this test to capture any industry effects.

equations. Here it is also found the coupon amount, callable issues, and two categories of the rating of the issue (BBB and BB) are found to have significance and positively (increase) effect the amount of the spread at issuance. The years to maturity, two classifications of the rating of the issue (B and CCC), bonds issued for refinancing purposes, and the NYSE and bear markets present a significantly negative impact on the spread which lowers its value. The one exception in this regression is firms that trade equities in the NASDAQ market are no longer significant at the 95% confidence level.[44] A dummy variable is used to group each individual firm with firms with similar SIC codes. Firms are identified at the 1000 SIC code level.

Equation 13 features the regression equation with the inclusion of a dummy variable to represent a firms industry classification by it's SIC code. The regression results show that firms classified in the 2000 SIC code have a positive coefficient value, however, it is not significant in determining the spread.

[44] The NASDAQ issuing firms are significant at the 94% confidence interval.

Firms with an SIC code of 1000, 3000, 4000, 5000, 7000, and 8000 all are found to have a negative coefficient value, but again do not reveal significance. Firms classified in the 6000 SIC code (13 instances) are lost in the regression analysis. These results would suggest that the industry in which the firm participates does not have an impact over the spread above the prevailing treasury rate at issuance. The industry results also do not support the hypothesis that younger, less established the industry is at issuance, the greater the spread will be. The only industry that shown to increase the spread is firms in the 2000 SIC code which is comprised on manufacturing firms. However, this test has the strongest measure of variation explained in the regression equation with an R^2 value of 51.60% and an adjusted R^2 of 49.44.

3.5 Conclusion

The intent of this chapter is to explain whether the spread at issuance of a high-yield bond can be explained by examining various bond and firm characteristics. Using a database of 703 observations over the period 1985-2003, I show that coupon payments, callable bonds and bonds with a rating of B and CCC are significant in determining the spread. I also show the length of the issue, bonds with a BBB and BB rating, firms whose equity trades in the NYSE and NASDAQ markets, bonds issued for refinancing purposes and bull market conditions have a significantly negative impact on the spread which lowers its value. Just as important as what impacts the spread is what does not. I find that amount of the issue, bonds issued for acquisition, general purposes and payments on borrowings, firms whose equity trades on the AMEX or OTC markets, the age of the firm at issuance, and first-time issuers have no significant impact over the spread. Furthermore, it is learned that a firms performance, which is measured by testing the current, total asset turnover, basic earnings power and their ratio of debt management also have no significant impact ever the spread. The final regression equation includes adding a dummy variable to identify the firm by the industry in which it participates. The variable also shows no significance in determining the spread. While this chapter provides insight into the composure of the spread, with only 50% of the variance explained by the regression equation, further work in this area must be completed to grasp a complete understanding of the pricing decision of a high-yield debt issuance.

CHAPTER 4

DEFINING THE LEVEL OF ABNORMAL RETURN UNDERPERFORMANCE THAT EXISTS FOR ISSUERS OF HIGH-YIELD BONDS COMPARED TO ITS BOND ISSUING INVESTMENT GRADE COUNTERPARTS AND NON-ISSUING FIRMS

4.1 Introduction

Choices over capital structure decisions have long intrigued academics, and have been a driving force for financial research. Early research looked at defining the use of debt and equity, and determining the optimal capital structure. Latter research has branched out to explore the impact of seasoned equity offerings (SEO's) and signaling theory, while research in debt issuances has focused on the various features within a debt security and how agency costs can be relaxed. Firms issuing bonds for the first time (bond IBO's) will significantly change their capital structure and effectively change the ownership and the debt maturity length of the firm. Datta, Iskandar-Datta and Raman (2000) find that announcements of a bond IBO will trigger negative stock returns. These negative stock returns are caused by the changes in the debt maturity and ownership structure. Along with changes to debt maturity and ownership are changes to the private issued/public issued debt ratio. Changes to the private/public debt use ratio include changes to the agency costs, and the additional costs of managing public debt.

Datta et al. (2000) document that firms issuing bond IBO's are generally small, little known companies, with a short history and are subject to a high amount information asymmetries. This will cause the firm to experience a higher level of agency costs than firms issuing seasoned bond offerings. A higher level of information asymmetry among public debt and equity holders will increase the firm's contracting costs. These higher contacting costs will lead to adverse incentive effects including asset-substitution problems and underinvestment. These increased costs are more prevalent in firms with high growth opportunities and are a result of anticipated agency differences between bond holders and equity holders. Krishnaswami, Spindt and Subramanian (1999) find firms with low contracting costs generally have high

proportions of debt in their capital structure. They further find that firms with high growth potential are better monitored by issuing private placements of debt.

A great deal of research has tried to derive the long term effects of a firm issuing new capital. Several models have been developed to capture the impact on a firm's stock price and whether underperformance is present surrounding an issue. Much of the literature focusing on how an issuance of debt will effect firm value is based on the previous research that focuses on the impact of equity issuances. Along with measuring the true impact of an issuance, several different methodologies have been developed to capture an underperformance. Depending on the model selected, the results of the various tests show little to no significance surrounding an issue to years of underperformance.

Datta et al. (2000) and Spiess and Affleck-Graves (1995) both examine the levels of underperformance that surround investment-grade bond IBO's, and find long-run stock underperformance does exist. Spiess and Affleck-Graves (1999) look at the level of underperformance that surrounds investment-grade bonds for firms issuing both straight[45] and convertible bonds. They also find long-run stock underperformance does exist for both types of issuances, and is greater for firms that are young, small in size and listed on the NASDAQ exchange. It is along these lines that provides the motivation for this chapter. Research has recently documented that long-run underperformance surrounds investment grade bond IBO's.

This chapter will attempt to fill the void in the research and examine the level of underperformance that surrounds high-yield bond IBO's, and whether high-yield bond IBO's have a greater level of underperformance than their investment grade counterparts. Section 2 surveys the various academic research that defines underperformance. Section 3 defines the generation of the data and the descriptive statistics. Section 4 shows the methodologies used over the dataset while Section 5 presents the results of the tests performed. The final section or Section 6 is the conclusion.

[45] Issuances of straight bonds are defined as not being callable nor have a convertible feature.

4.2 Literature Review

Loughran (1993) and Ritter (1991) both show firms that engage in equity IBO's will significantly underperform the market for a period up to five years after the initial placement of equity compared to non-issuing firms. Loughran (1993) compares NASDAQ stock IBO's to similar sized NASDAQ firms that have been listed on the exchange for 5 years or more. He finds the average 5-year holding return is 17.29% for the IBO firms compared to 76.23% for holding the NASDAQ index over the same period. Ritter (1991) uses a sample of 1,526 stocks for the period 1975-84. Using cumulative abnormal returns to measure underperformance, he finds IBO's will underperform matched firms by industry and market value by 16.90% over the three year period beginning with the IBO date. Loughran and Ritter (1995) evaluate companies that issue either IBO's or SBO's between 1970 and 1990. Computing buy-and-hold returns and a Three-Factor regression model, they find both significantly underperform non-issuing firms. Using a period of 5 years after the issuance, investors of IBO's only received a 5% return per year over the period, while investors in SBO's received 7% return per year. On average, bond investors would have to invest 44% more in issuing firms than non-issuers of the same size to have an equal return at the end of 5 years.

Spiess and Affleck-Graves (1995) use holding period returns between issuing firms and benchmark firms to determine the level of underperformance after an SBO. They compute average monthly adjusted returns as documented by Fama and French (1992) and determine the cumulative average return being the sum of the monthly average return. Cumulative average returns are then compared between the equity issuing firm and benchmark firms that do not issue equity over the 3 and 5 year test periods. The results yielded an underperformance of 14.60% over the immediate 3-year period after the SBO to 21.40% underperformance for the immediate 5-year period compared to its benchmark firms, matched based on size and market to book value. Ikenberry, Lakonishok and Vermaelen (1995) evaluate firms that complete share repurchases in the open market between 1980-1990. They find the average buy-and-hold return is a positive 12% per year for a period up to four years after the repurchase. Their research shows value firms experience a positive return of 45.30%.

Long-run studies such as these can provide evidence as to the information content of equity, and can provide a framework to understand the information content of newly issued bonds. Datta et al. (2000) use methods first proposed by Barber and Lyon (1997) featuring buy-and-hold returns to determine whether stock return underperformance exists surrounding bond IBO's. Datta et al. (2000) shows underperformance surrounds bond IBO's as much as 33.39% and 55.99% over the 3 and 5 year period after the issue. This level of underperformance is greater than the amount of underperformance associated with seasoned bond offerings, which Affleck-Graves and Miller (2003) report to be between 11% and 22% over a five-year period. Consequently, Jewell and Livingston (1997) provide evidence that there are no abnormal returns surrounding an issuance of straight bonds.

Dichev and Piotroski (1999), Spiess and Graves-Affleck (1999) and Lee and Loughran (1998) studied the effects of callable bonds, and documented that greater underperformance is observed when firms issue callable bonds as opposed to straight bonds. Kish and Livingston (1992) present five theories as to why firms issue bonds that are callable. These theories include: agency costs, interest rates, managerial flexibility, maturity substitution and taxes. King and Mauer (2000) believe there are three distinct reasons why firms will call a bond including: issuing new bonds at a lower interest rate, to release the firm from restrictive covenants in existing bank debt, and adjust the capital structure of the firm to the industry average. Affleck-Graves and Miller (2003) find abnormal returns exist in the 5 year period after a firm calls straight bonds. This can range anywhere from 0.16% to 0.34% per month which equals 11%-22% over the 5 year period tested.

4.2.1 Bond IBO's, Callable or Convertible Issues

There is plenty of academic literature that researches the long-term stock price effects derived from events such as equity issuances, mergers and acquisitions, and investment grade bonds. However, research into the long-term impact of firms that issue high-yield bonds is scarce at best. Most of the research conducted in this area has focused on distress events, or is included in studies that do not differentiate between investment and non-investment grade bonds.

Datta et al. (2000) examine long-run implications of debt structure changes using U.S. bond issuances from 1971 to 1994 through 233 bond IBO's. They find that issuances of bonds resulted in simultaneous and pronounced changes in maturity and ownership structure. Using size and book-to-market matched control firms as benchmarks as proposed by Lyon, Barber and Tsai (1999) and Barber and Lyon (1997), they find firms that bond IBO's will substantially underperform size and book-to-market benchmarked firms. The level of underperformance is 33.39% over a 3-year post issue period, and 55.99% over a 5-year post-issue period. The results are similar to those of equity offerings, but contrasts are observed for seasoned bond offerings. Datta et al. (2000) also find evidence that bond issuances are timed to coincide with the market expectations concerning firms' prospects. They find that post-issue underperformance will be greater given longer maturity issues and provide direct evidence revealing that firms that issue bonds will experience a significant reduction in growth opportunities following the offering. The reduction in growth opportunities is one possible explanation for the underperformance of the issuing firms. Tests assessing long-run performance by bond issuing firms fail to use a dataset strictly of firms' that issue high-yield bonds. Bond investors generally require higher compensation for investing in non-investment grade bonds. Research needs to be conducted to understand the level of stock return underperformance for non-investment grade bond issuing firms.

Convertible bonds allow the holder of the note to convert the debt instrument into stock at a pre-specified price at the will of the holder. Investors have long believed this is an attractive feature which will allow them to convert their bonds into stocks if and when the stock of the company performs better than anticipated. Dichev and Piotroski (1999) evaluate convertible bonds IBO's and find new issuances will underperform the market by as much as 50%-70% in the 5 years following the issue; suggesting that convertible bonds are a signal of eroding future profitability. The data presented in this case does not distinguish whether it was a firm's first issue of debt. Spiess and Affleck-Graves (1999) present research of a similar nature and find results similar to those of Dichev and Piotroski (1999) but explain the underperformance to be more severe for young, small companies that are listed on the NASDAQ exchange. In addition, the underperformance is limited to periods where high volumes of debt issuances occur. Both papers feature the Barber and Lyon (1997) methodology using matched firms and buy-and-

hold returns to determine whether long-term cumulative abnormal returns exist for convertible bonds. The gap to fill in the current research is to determine whether stock return underperformance exists surrounding high-yield bond IBO's with a convertible feature and whether this underperformance is at a level similar to their investment grade counterparts.

Affleck-Graves and Miller (2003) extend the work of Dichev and Piotroski (1999) and Spiess and Affleck-Graves (1999) by evaluating long-run performance of common stock for firms that exercised a call option for both straight and convertible bonds. Instead of using the Fama French (1993) Three-Factor regression model to derive their results as Dichev and Piotroski (1999) used, Affleck-Graves and Miller (2003) use the buy–and-hold returns methodology for evaluating abnormal returns. Both models provide the same general conclusions however the Fama French Three-Factor model provides stronger tests of significance. The results reveal firms that call an issue of straight bonds will have an average abnormal return of +0.16% per month while firms that exercise their call option over convertible bonds will enjoy a +0.34% abnormal return per month, equating to an +11% to +22% abnormal return over a five year period. These results do not support the claim that callable, convertible bonds provide negative signals to the investment community. While the evidence provided does not support the claim that callable, convertible bonds sends negative signals to the investment community, only a database of investment grade bonds was used. Therefore, how the investment community reacts to a high-yield bond IBO's with a callable feature is unknown and presents an opportunity for future research.

4.2.2 Contribution to the Existing Literature

I will complete a long-run analysis featuring buy-and-hold return methodology using size and book-to-market-matched control firms as benchmarks to high-yield bond IBO issuing firms for the period January 1995 to December 1998. Analysis over long-run performance will cover the immediate 5-year observation period after the issuance. A second set will be comprised, for comparison purposes, of investment grade bond IBO issuers and benchmark firms over the same period. After identifying whether long-term underperformance is present among non-investment grade issuers versus its benchmark firms,

as well as investment grade issuers versus its benchmark firms, the test results will show what level of underperformance is prevalent in both tests. I will also use the Fama French Four-Factor model as a method of evaluation over the same period. It will then be determined whether non-investment grade issuing firms have abnormal stock returns that underperform in the long run more than their counterpart investment grade issuing firms. Underperformance will be measured at the 3 and 5 year intervals following the previous research of Datta et al (2000) and Spiess-Affleck-Graves (1999). I expect to find firms issuing high-yield debt instruments (bond IBO's) will exhibit underperformance in their outstanding equity, and this level of underperformance will be greater than their investment grade counterparts given the additional riskiness of the issuance, their position in the capital structure (generally subordinate), and the higher default rates associated with high-yield debt. I hypothesize that firms issuing high-yield bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms. I also hypothesize that firms issuing high-yield bond IBOs' will exhibit greater stock price underperformance than their investment grade bond IBO issuing counterparts.

Dichev and Piotroski (2001) found new issuances (IBO's) of investment-grade convertible bonds will under-perform in the equity market by as much as 50%-70% in the 5 year period after the issue. The gap that exists in the current academic literature is determining if underperformance exists for convertible high-yield bond IBO's, and to what extent. I fill this gap by identifying high-yield bond IBO's with a convertible feature and measure the level of stock price underperformance over the 3 and 5 year periods following the issuance. Furthermore, I will complete the same tests over an investment-grade dataset for comparison purposes to the high-yield issuances. I expect to find that high-yield issuance will have a greater level of underperformance for the same reasons present in the previous paragraph. I hypothesize that firms issuing high-yield convertible bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms. I also hypothesize that firms issuing high-yield convertible bond IBOs' will exhibit greater stock price underperformance than their investment grade convertible bond IBO issuing counterparts.

Affleck-Graves and Miller (2003) use the buy–and-hold returns methodology for evaluating abnormal returns and find firms that call an issue of debt before maturity will have an average abnormal return of +0.16% per month, while firms that exercise their call option over convertible bonds will enjoy a +0.34% abnormal return per month. Equating to a +11% to +22% abnormal return over a five year period. Dichev and Piotroski (2001) find the equity of firms that issue investment-grade callable bond (IBO's) will underperform the market by as much as 55%-75% in the 5 year period prior to the issue. Current academic research has not identified if the equity of the firm will underperform when issuing non-investment grade callable bond IBO's. This research will identify bond IBO's that are issued callable, and measure the level of equity underperformance for a period of 5-years after the issuance for both investment and non-investment grade bonds. It can be learned whether equity underperformance exists for high-yield issues and to what extent the under-performance exists when compared to its investment grade counterparts. I expect to find equity underperformance does exist for high-yield issuances, and the level of underperformance is greater for these issuances compared to investment grade bonds. I expect high-yield bond IBO's will reveal greater underperformance given the additional riskiness of the issuance, their subordinate position in the capital structure, and the higher associated default rates. I hypothesize that firms issuing high-yield callable bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms. I also hypothesize that firms issuing high-yield callable bond IBOs' will exhibit greater stock price underperformance than their investment grade callable bond IBO issuing counterparts.

4.3 Data and Descriptive Statistics

I start by building a database of U.S. initial public debt offerings differentiating between high-yield or investment grade debt, convertible or callable bonds, first-time issuers and the issue date for the period 1995-1998 from the Securities Data Company (SDC) database. Other variables of interest extracted from the SDC database include: rating of the issue, SIC code, issue and maturity dates, ticker, exchange of the issuing firms equity, amount issued, coupon amount, callable status and whether there is a convertible feature. The SDC database is also used to note any rating changes of the debt issuances for the immediate 5-year period after the announcement date. The data is then sorted between investment-grade issues and non-investment grade issues, noting whether the issue is of straight, callable or convertible. I then match the identified firms to gather return information using the Center for Research in Security Prices (CRSP) database for the 5-year period following the announcement of an issuance. CRSP is also used to identify if any issuances (IPO's, SEO's or splits) of equity have been issued over the sample period by bond issuing firms. Firms issuing either stocks or bonds during the 5-year period of the bond issuance are excluded from the sample. Financial information used for matching the firms over size and book-to-market value is then obtained from the Compustat database.

Both the CRSP and the Compustat databases are used in generating the pool of matched firms. The pool of matched firm consists of firms that have not issued bonds or equity over the observation period. The SDC database shows any bond issuances, while the Compustat database is used to identify any equity issuances (IPO's or SEO's) over the sample periods and any stock splits that may have occurred. Firms issuing bonds or equity over the sample period are then not eligible to be included in the matched firm pool. Once all the non-issuers are established, financial information over return, size and book-to-market value is then matched with the firm using the Compustat database.

The investment grade bond data obtained from the SDC database revealed 1382 issuances of investment grade bonds over the 1995-1998 observation period. This chapter will test the long-run reaction for bond IBO's, callable bond IBO's, and convertible bonds IBO's. Three different databases will

have to be constructed using each of the variables as the primary constraint. Filtering the database for bond IBO's over the sample period and matching them with return information from the Compustat database netted 95 observations. Completing this process for callable bonds[46] as well as convertible bond yielded 165 observations of callable bond IBO's and 43 convertible bond IBO issuances.

Similar to the investment grade databases, the non-investment grade issuers are also sorted by first-time issuers (bond IBO's), and whether the issuance is callable or convertible. The initial extraction of data from the SDC database netted 1986 observations over the 1995-1998 period. Identifying first-time issuers with complete financial information resulted in 196 observations. Callable IBO and convertible IBO issues of high-yield bonds with complete financial information yield 216 callable bonds and 59 convertible bonds.

Table 17 provides the descriptive statistics for the database. Panel A of Table 17 shows there are 95 bond IBO's of investment grade with an average coupon amount of 6.98% and an average issuance amount of $173.14, and 196 bonds of non-investment grade in the sample with an average coupon amount of 8.66% and an average issue amount of $203.58 million. The investment grade set is comprised of 3 AAA bonds with an average coupon amount of 6.53% and an average issuance amount of $200 million, 17 AA bonds with an average coupon amount of 6.46% and an average issuance amount of $238.71 million, and 75 A bonds with a 7.14% average coupon amount and an $157.2 million average issuance amount. The non-investment grade bonds are represented with 27 BBB bonds having an average coupon of 6.59% and an average issue amount of $256.86, 51 BB bonds with an average coupon amount of 8.69% and an average issuance amount of $230.81 million, 106 B-rated bonds with an average coupon amount of 9.20% and a $180.35 million average issuance, and 12 CCC-rated with a 8.07% average coupon amount and a $173.22 million average issuance amount.

[46] A bond issuance can be represented in the bond IBO category as well as being callable or convertible.

Table 17 - Descriptive Statistics

This table shows the number of issuance in each bond classification as well as the average coupon and issue amounts. Panel A show the descriptive statistics for straight Bond IBO's for the 1995-1998 period. Panel B shows the descriptive statistics for callable bond IBO's while Panel C list the descriptive statistics for bond IBO's issued that are convertible. One side of the table shows the aggregate amounts of the issuances while the other side divides the data into bond ratings.

Panel A - Straight Bonds IBO's

Investment Grade

Total Number	Average Coupon	Average Issue Amount (millions)	Bond Rating	Number	Average Coupon (percentage)	Average Issue Amount (millions)
95	6.985%	$173.14	AAA	3	6.533%	$200.00
			AA	17	6.467%	$238.71
			A	75	7.148%	$157.20

Non-Investment Grade

Total Number	Average Coupon	Average Issue Amount (millions)	Bond Rating	Number	Average Coupon (percentage)	Average Issue Amount (millions)
196	8.644%	$203.58	BBB	27	6.594%	$256.86
			BB	51	8.691%	$230.81
			B	106	9.209%	$180.35
			CCC	12	8.073%	$173.22

Panel B - Callable Bonds

Investment Grade

Total Number	Average Coupon	Average Issue Amount (millions)	Bond Rating	Number	Average Coupon (percentage)	Average Issue Amount (millions)
165	6.702%	$221.02	AAA	4	6.586%	$450.00
			AA	31	6.454%	$228.67
			A	130	6.765%	$212.15

Non-Investment Grade

Total Number	Average Coupon	Average Issue Amount (millions)	Bond Rating	Number	Average Coupon (percentage)	Average Issue Amount (millions)
216	7.137%	$225.83	BBB	173	7.080%	$214.65
			BB	40	7.456%	$307.75
			B	3	8.042%	$150.00
			CCC	0	0.000%	$0.00

Panel C - Convertible

Investment Grade

Total Number	Average Coupon	Average Issue Amount (millions)	Bond Rating	Number	Average Coupon (percentage)	Average Issue Amount (millions)
43	6.155%	$339.75	AAA	12	6.397%	$284.73
			AA	1	3.250%	$1,000.00
			A	0	0.000%	$0.00

Non-Investment Grade

Total Number	Average Coupon	Average Issue Amount (millions)	Bond Rating	Number	Average Coupon (percentage)	Average Issue Amount (millions)
59	5.783%	$215.66	BBB	18	5.279%	$314.50
			BB	8	5.500%	$236.31
			B	27	6.111%	$143.00
			CCC	6	5.833%	$231.27

Panel B of Table 17 shows there are 165 callable bond IBO's of investment grade with an average coupon amount of 6.70% and an average issuance amount of $221.02, and 216 bond IBO's of non-investment grade in the sample with an average coupon amount of 7.13% and an average issue amount of $225.83 million. This investment grade set is comprised of 4 AAA bonds with an average coupon amount of 6.58% and an average issuance amount of $450 million, 31 AA bonds with an average coupon amount of 6.45% and an average issuance amount of $228.67 million, and 130 A bonds with a 6.76% average coupon amount and an $212.15 million average issuance amount. The non-investment grade bonds are represented by 173 BBB bonds having an average coupon of 7.08% and an average issue amount of $214.65, 40 BB bonds with an average coupon amount of 7.45% and an average issuance amount of $307.75 million, 3 B-rated bonds with an average coupon amount of 8.04% and a $150 million average issuance. No CCC bonds are used that are callable due to incomplete information.

Panel C of Table 17 reveals 43 convertible bond IBO's of investment grade with an average coupon amount of 6.15% and an average issuance amount of $339.75, and 59 bond IBO's of non-investment grade in the sample with an average coupon amount of 5.78% and an average issue amount of $215.66 million. This investment grade set is comprised of 12 AAA bonds with an average coupon amount of 6.39% and an average issuance amount of $28.73 million, 1 AA bond with a coupon amount of 3.25% and an issue amount of $1 billion. No A-rated bonds were found to be of complete information. The non-investment grade bonds are represented with 18 BBB bonds having an average coupon of 5.27% and an average issue amount of $314.50, 8 BB bonds with an average coupon amount of 5.50% and an average issuance amount of $236.31 million, 27 B-rated bonds with an average coupon amount of 6.11% and a $143 million average issuance and 6 CCC-rated with a 5.83% average coupon amount and a $231.27 million average issuance amount.

4.4 Methodology

The intention for this line of research is to identify firms that issue high-yield bonds for the period 1995-1998 and whether the firms' equity will underperform compared to firms that issue investment grade bonds and non-issuers of stocks or bonds. Firms issuing a high-yield bond are matched by size and book-to-market value to firms that do not issue stocks or bonds over the 5-year period after the event date. An issuance of a high-yield bond is identified by having a credit rating of BBB or below when issued and maintain non-investment grade status over the observation period. Similarly, firms issuing investment grade bonds will also be matched by size and book-to-market value to firms that do not issue stocks or bonds over the 5-year period after the event date. An issuance of an investment grade bond is identified by having a credit rating of A or above at issuance, and maintaining investment grade status over the observation period. Long-run stock performance after an issuance of high-yield debt will be evaluated in the following three bond classifications: straight bonds, convertible bonds and callable bonds. The dataset of investment grade issuing firms will also be sorted by the same three classifications.

All publicly traded firms listed on CRSP which do not issue stocks or bonds during the 5-year post issue period will be used to create a pool of matched firms[47]. Issuing firms can be eligible to be included in the pool of matched firms if continuing to operate over the complete 5 year period after the issuance of the event firm. Firms will be ranked at each month-end by market capitalization (size)[48] and book-to-market ratio[49]. The book-to-market ratio for the issuing firm will be computed the month preceding the calendar month of the public debt announcement while the market capitalization will be of the month prior to the announcement date.

Following Datta et al (2000), I will match the sample firm with a control firm using the pool of firms when the sum of the absolute percentage difference between the size and book-to-market ratio of the

[47] Firms will be matched with firms of the same exchange where its equity is traded.
[48] the market capitalization is calculated by share price times number of shares outstanding
[49] The BM ratio is calculated by dividing the book equity value by the market capitalization

sample firm and the matched firm is minimized. I will attempt to follow Spiess and Affleck-Graves (1999) where the pool of potential matching firms is constrained. The sample is constrained to matched firms that are no more than 10% smaller than their sample firms. In cases where no match firms are available in the same industry, the sample firms will be matched using only size and exchange.

4.4.1 Models of Long-Run Return

In order to properly measure a return, it is crucial to understand what a return is. Academic research has developed several methods in an effort to define a return. Fama, Fisher, Jensen and Roll (1969) first used event study methodology to show how the market reacts to company events over short periods. Whether using a market model (standard or adjusted) or the capital asset pricing model (CAPM) in identifying an abnormal return, all these models provide relatively the same results. Consequently, applying event study methodology to long-run returns does not provide accurate results.

Long-run return methodologies have developed into two different approaches in academic literature. These can be classified as the time-series approach and the cross-sectional approach. The two most common models of time-series used feature the market model or the CAPM model. These models all are based on the premise that the sample parameters are estimated using a non-sample period, making this the time-series approach. A three-factor regression model pioneered by Fama and French (1993) takes a cross-sectional approach and uses reference portfolios through matching, to define an expected return. The underlying assumption of this model is the matched portfolios have like characteristics of the firms of the reference portfolios, but do not experience an event like the firms in the reference portfolios.

Barber and Lyon (1997) provide evidence that previous research measuring abnormal returns through reference and matched portfolios are flawed using the market index model. They show prior research is mis-specified and experiences rebalancing and skewness bias as well as new listing bias when using the reference portfolio as a benchmark. These biases can lead to unsubstantiated rejecting of

the hypothesis tested. Barber and Lyon (1997) show that to adequately correct for the biasness, research should be conducted by using a control firm approach. The control firm approach pairs event firms with non-event firms based on size and their book-to-market ratio. Fama (1998) concludes that various criteria such as size and book-to-market ratios can produce different returns based on the criterion selected. Additionally, he shows building portfolios based on size and book-to-market value may not properly equate the average return since it may not accurately predict cross-firm variation.

In the short run, calculating an abnormal return is finding the difference between the actual and the expected return. Calculating long-run returns in this manner would introduce biasness into the sample. To correct for this biasness, two methods have been identified: the cumulative approach and using buy-and-hold returns. The cumulative approach is done by adding together the abnormal returns for each month of the sample period. Calculating the average of the observed monthly abnormal returns is another way the cumulative approach can be done. The buy-and-hold return approach simply compounds an abnormal return monthly for each month of the sample period.

4.4.2 Buy-and-hold Returns Model

Barber and Lyon (1997) showed how the cumulative approach and the buy-and-hold approach tackle different problems. Their example compares using a 12-month cumulative return with an annual buy-and-hold return. By dividing a 12-month cumulative return by 12 provides an average monthly return. Testing a null hypothesis where the 12-month cumulative return is equal to zero would be the same as testing the null of the mean of the monthly abnormal return would also have to be equal to zero. Finding an annual mean abnormal return equal to zero is not testing the null hypothesis. Effective tests of the null would be to use a buy-and-hold return methodology. Fama (1998) came out in favor of the cumulative approach over the buy-and-hold return approach. He suggests most asset pricing models have normally distributed returns. Normality will be a better estimator for short horizons compared to longer horizons. He also states that most tests using asset pricing models traditionally use monthly returns, not yearly or even 3-5 year returns.

Buy-and-hold returns are used to measure the abnormal stock returns associated with issuances of high-yield bonds. Barber and Lyon (1997) show buy-and-hold returns are calculated by subtracting the return of the match firm from the return of the event firm during the same observation period:

$$BAHR_{it} = \left[\prod_{t=1}^{T}(1+R_{it)}\right] - \left[\prod_{t=1}^{T}1+E(R_{it})\right] \tag{14}$$

where day *t =1* is the first trading day following the offer, R_{it} is the return on stock *i* on day *t*, and, *T* is the 5-year anniversary date of the offer, or the offering firm's CRSP delisting date, whichever is earlier.

Most academic research dealing with returns is focused on the return of the event firm. Two approaches are commonplace to find the average performance in the sample; equally-weighted returns, and value weighted returns. Fama (1998) believes value weighted returns are the better predictor of average returns for small stocks since all asset pricing models show systematic problems and better reflect total wealth of the investor. Loughran and Ritter (2000) believe value weighted returns underestimate an abnormal return when the event is triggered by a management decision. They show this using both simulation and security analysis, and find returns should be equally weighted.

4.4.3 Fama French Regression Model

A second method used to determine long-run return is using a time-series regression model. This method uses the event firm and regresses post event excess returns for the event month with a series of risk factors. The Fama French Three-Factor model is the most commonly used and regresses the post-event abnormal return with a market, size, and book-to-market factors. The intercept of the regression represents the average abnormal return over the post-event time period. Negative intercepts imply that the event firm has underperformed the market. The market factor is derived by taking the return over the value weighted market index, less the risk free rate. The one-month T-bill rate is generally used to represent the risk free rate. The size variable is calculated by subtracting the value of the smaller stocks weighted portfolio, minus the return of the bigger stocks value weighted portfolio. The book-to-market

variable is computed taking the return of the value-weighted portfolio for higher book-to-market stocks and subtracting the return of the value-weighted portfolio for lower book-to-market stocks[50]. Brav, Geczy and Gompers (2000) suggest adding a fourth factor to the model in instances when prior changes to underlying stock price have taken place. A momentum factor is added to capture significant price changes and is derived by taking the average return on two lower prior-return portfolios, and subtracting them from the average return on two high prior-return portfolios. The equation for representing the Four-Factor model is:

$$R_{pt} - r_{ft} = a + b_1(r_{mt} - r_{ft}) + b_2(SMB_t) + b_3(HML) + b_4(UMD) + e_{pt} \quad (15)$$

where R_{pt} is the return on the portfolio interest in month t; $(r_{mt} - r_{ft})$ is the market premium factor, constructed by subtracting the Treasury bill (T-bill) return from the return on a value-weighted index; SMB is a size factor constructed by subtracting the return on the portfolio of large capitalization stocks; HML is a book-to-market factor and UMD is a momentum factor computed by the average return on two high-prior-return portfolios minus the average return on two low-prior-return portfolios.

4.4.4 Model Selection

Lyon et al. (1999) support the use of benchmark portfolios free of new listings and rebalancing biasness when calculating buy-and-hold abnormal returns over biasness reference portfolios. However, they also show mis-specified test statistics can arise when testing non-random samples or samples where all observations have the same event taking place. The misspecification is related to the inability of the size and book-to-market ratios capturing all the misspecification of the CAPM. Lyon, et al. (1999) recommend adding other variables such as long-run return performance into the long-run tests and comparing sample (event) firms to benchmark (non-event) firms to develop performance benchmarks.

[50] The factors are available for download at Kenneth French's website; http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html

They suggest using holding period returns where:

$$HPR_{(i,a,b)} = (\prod_{t=a}^{b} R_{it} + 1)) - 1 \quad (16)$$

where the $HPR_{(i,a,b)}$ is the holding period for company *i* during the period *a* to *b*; R_{it} is the daily return on the common share of company *i* in day *t*

The excess return for an individual stock is calculated by subtracting the return of the matching firm from the event-firm. This excess return is represented by:

$$ER_{(i,a,b)} = \prod_{t=a}^{b} (R_{it} + 1) - \prod_{t=a}^{b} (R_{mt} + 1) \quad (17)$$

where $ER_{(i,a,b)}$ equals the return for firm *i* from the time period *a* to *b*; R_{it} is the daily return on the common share of company *i* in day *t*; R_{mt} is the return on the common share of the matching firm in day *t*

The same holding periods will be used to calculate the buy-and-hold returns of sample firms and their corresponding benchmarks. In cases where a firm delisting takes place before the end of the 5-year period, the CRSP value-weighted returns will be inserted into the calculation of the buy-and-hold return by the removal date. Lyon et al. (1999) show that replacing a delisted firm with the CRSP value-weighted index does not create a significant change in the buy-and hold return for the benchmark firm. The average holding period return would be calculated as:

$$HPAR = 1/\sum_{i=1}^{N} ER_i \quad (18)$$

where the HPAR is the average holding period return with N being the number of firms

Although buy-and-hold returns can provide mis-specified results due to new listing, skewness and re-listing biasness, they show a conventional t-statistic is accurate to measure statistical significance of the average returns when using matching firms over reference portfolios. T-statistics are calculated using the

cross-sectional standard deviation over the abnormal return for the relevant period. I will use this holding period approach to determine whether stock return underperformance of the issuing firms' equity is present over straight, callable and convertible bond IBO's of both investment and non-investment grade.

Fama (1998) argues that holding period returns do not take into consideration any cross-sectional dependence for the event firms' abnormal returns. This overlap in calendar time tends to overstate the test statistics. In addition, Mitchell and Stafford (2000) state that holding period return methods are likely to result in overstated statistics. To control for this, I will also use the Fama French model using portfolio methods. In each calendar month a portfolio is made during the prior period (c_i, c_j) where c represents the calendar month and i and j represent the integers that range from month 1 to 60. For example, if *i* = 36 and *j* =25, we are analyzing the abnormal return in the post announcement period years 2 and 3. Tests of significance over the abnormal return will feature the Fama French four-factor model. The Four-Factor model regresses the post event monthly excess returns for the firm on a market factor and a book-to-market factor:

$$R_{pt} - r_{ft} = a + b_1(r_{mt} - r_{ft}) + b_2(SMB_t) + b_3(HML) + b_4(UMD) + e_{pt} \quad (19)$$

where R_{pt} is the return on the portfolio interest in month t; $(r_{mt} - r_{ft})$ is the market premium factor, constructed by subtracting the Treasury bill (T-bill) return from the return on a value-weighted index; SMB is a size factor constructed by subtracting the return on the portfolio of large capitalization stocks; HML is a book-to-market factor and UMD is a momentum factor computed by the average return on two high-prior-return portfolios minus the average return on two low-prior-return portfolios.

The value of the intercept using this methodology represents the mean cumulative monthly abnormal return for the event portfolio over the observation period. Negative intercepts imply the event firm has underperformed in the equity markets compared to their benchmark firms. Positive intercepts implies the event firm has overperformed in the equity markets compared to their benchmark firms. The regression equation will be estimated using ordinary least-squares and weighted least-squares. Affleck-Graves and Miller (2003) and Loughran and Ritter (2000) use weighted least-squares to weight each month by the number of firms that had an issuance of bonds over the observation period given, this is due to each month having a different number of observations. This has the same effect as equally weighting each firm in the regression equation.

4.5 Testing and Results

The first series of tests feature the buy-and-hold returns methodology as suggested by Lyon et al. (1999) to determine whether stock return underperformance exists and to what extent. The second series of tests use the Fama French Four-Factor regression model using both ordinary and weighted least-squares techniques. The weighted least-squares technique is used to account for the different number of observations in the database each month. Over the 3-year bond IBO observation window and the subsequent 5-year performance of the issuing firms' equity period, the number of observations changes as new bonds are being issued each month over the first three years. The same thing will happen in the last three years of the equity performance window as each bond will reach the end of the 5-year testing period and will no longer be evaluated.

4.5.1 Buy-and-Hold Return Results

Table 18 reports the holding period returns for the subsequent 3 and 5-year periods after a bond IBO during the period 1995-1998. Panel A of Table 18 shows both bond IBO's of investment grade and non-investment grade experience a significant level of stock return underperformance. It is found that bond IBO's of investment grade will underperform their matching firm counterparts by 32.69%. The level of underperformance is increased to 54.32% over a 5-year period. Both of these results reveal significance at the 99% confidence level with t-statistics of -7.36 and -8.93 respectively. These results are similar to those of Lyon et al. (1999). High-yield bond IBO's also exhibited a significant level of underperformance (t-statistics of -7.23 and -7.93) at the 99% confidence level. Bonds evaluated for 3-years after issuance underperform their match firms by 38.86%. This number increases to 61.38% over the immediate 5-year period after issuance. These results suggest that high-yield bond IBO's have a greater level of stock return underperformance than their investment grade counterparts in both the initial 3 and 5 year periods after the issuance.

Table 18: Long-Run Buy and Hold Abnormal Returns

The table shows the average long-term (buy-and-hold) abnormal stock returns for holding periods that extend from 3 and 5 years following the announcement a debt issuance. The abnormal return calculated is shown in equation #4. Matching firms are selected using the following matching criteria: size - which is measured by the market value of the event firm as of one month before the announcement date and obtained from the CRSP database; and the ratio of book to market value – this is measured as of the end of the fiscal year prior to the announcement date using the COMPUSTAT database. The matching firms did not issue debt or equity including stock splits during the period five years after the event firm announcement date. ***, **, and * denote significance at the 1, 5 and 10 percent levels.

Panel A: Straight Bond IBO

Type of Issuer	Statistic	Buy and Hold Return 3-years	Buy and Hold Return 5 years
Investment Grade Bond IBO Issuer	Abnormal Return	-32.69%	-54.32%
	t-statistic	*-7.36***	*-8.93****
High-Yield Bond IBO Issuer	Abnormal Return	-38.86%	-61.38%
	t-statistic	*-7.23****	*-7.93****

Panel B: Callable Bonds IBO

Type of Issuer	Number of Observations	Statistic	Buy and Hold Return 3-years	Buy and Hold Return 5 years
Investment Grade Bond Issuer		Abnormal Return	-37.23%	-55.47%
		t-statistic	*-4.91****	*-5.88****
High-Yield Bond Issuer		Abnormal Return	-41.28%	-63.32%
		t-statistic	*-3.57****	*-4.28****

Panel C: Convertible Bond IBO

Type of Issuer	Number of Observations	Statistic	Buy and Hold Return 3-years	Buy and Hold Return 5 years
Investment Grade Bond Issuer		Abnormal Return	-27.56%	-47.81%
		t-statistic	*-3.89****	*-6.02****
High-Yield Bond Issuer		Abnormal Return	-33.87%	53.21%
		t-statistic	*-3.39****	*-4.02****

Panel B of Table 18 shows the test results for callable bond IBO's of both investment and non-investment grade. Callable bonds allow the firm to retire bonds before the maturity date. This allows the firm to take advantage of lowering interest rates, and issue bonds of a lower rate and retire bonds of a higher rate. It is found that investment grade callable bond IBO's underperform their match firm counterparts by 37.23% in the immediate 3 years after the issue and 55.47% over the 5 year post issue period. This level of stock return underperformance is generally the same level as Dichev and Piotroski (1999) find. Similar to straight bond IBO's, high-yield callable bond IBO's show a greater level of underperformance than their investment grade counterparts. High-yield callable bond IBO's underperform their matched firms by 41.28% in the 3-year post-issue period. This level of underperformance is increased to 63.32% in the 5-year post period. Both the investment and non-investment grade callable bond IBO's are found to be of significance at the 99% confidence level.

The last panel in presented in Table 2 (Panel C) features the buy-and-hold return results for firms issuing bond IBO's with a convertible feature. Investment-grade convertible bonds reveal the lowest level of underperformance compared to their matched counterparts. Stock return underperformance of 27.56% and 47.81% are observed over the 3 and 5-year post issue periods. These results are similar to what previous academic literature has found. High-yield convertible bonds also underperform the match sample firms by 33.87% in the 3-year post issue period and 53.21% in the 5-year post issue period. All convertible bond results are significant at the 99% confidence level using a two-tailed test (t-statistics). Just as with straight bond and callable bond IBO's, high-yield bonds underperform at a greater level than their investment-grade counterparts. Investment grade bonds with a call feature are shown to underperform less than straight bonds and callable bonds. Callable bond IBO's exhibit the greatest level of underperformance. Non-investment grade bonds show the same relationship with convertible bonds having the lowest level of underperformance followed by straight bonds and callable bonds.

4.5.2 Fama French Four-Factor Model Returns

Fama (1998) argues using criterion such as size and book-to-market ratios can produce different returns based on the criteria selected. He also believes building portfolios based on size and book-to-market value may not properly equate the average return since it may not accurately assess cross-firm variation. Fama (1998) believes a calendar-time cumulative regression approach will accurately determine long-run abnormal returns better than the buy-and-hold method. The chapter continues using the same bond IBO characteristics and issuances used in the buy-and-hold return section now using the Fama French Four-Factor Model as the method of evaluation. I will use both an ordinary least-squares technique and a weighted least-squares technique. Affleck-Grave and Miller (2003) and Loughran and Ritter (2000) both use weighted least-squares to weight each month by the number of firms that had an issuance of bonds over the observation period given. Each month in the dataset has a different number of observations due to bond IBO's occurring randomly. Weighted least-squares has the same effect as equally weighting each firm in the regression equation. Fama (1998) shows the intercept of the regression represents the average abnormal return over the post-event time period. This is represented by the character α (alpha) in the regression results. Emphasis will be placed on weighted least squares results due to the varying number of IBO's in each month.

Table 19 shows the various tests of significance over the dataset for the 3-year post offering period. The table shows the value of the coefficients for each of the four factors, and the intercept of the equation evaluating investment and non-investment grade straight bond IBO's. Panel A of Table 19 shows the level of stock return underperformance for investment grade issuers is 0.88% per month. Over a 3-year period this compounds to 31.68%.[51] Non-investment grade bonds issuers underperform a bit more than their investment grade counterparts at 0.93% per month or 33.48% over the 3-year period. Panel A of Table 20 lists the results for investment and non-investment grade issuers over 5-year window after issuance. Investment grade bonds exhibit 0.85% underperformance per month or 51.00% over the 5-year period. The non-investment grade results show a 0.97 underperformance per month or 58.20%

[51] This is calculated by multiplying the level of underperformance times 36 months.

Table 19: Fama-French Four-Factor Regression Estimates - 3 Year Returns

Table 3 shows the post-announcement average monthly abnormal stock returns for event firms. These are estimated using the Fama-French calendar time portfolio regressions. Fama (1998) argues this method will overcome any statistical problems using long-term buy-and-hold returns. This is represented by equation below.

$$R_{pt} - r_{ft} = a + b_1(r_{mt} - r_{ft}) + b_2(SMB_t) + b_3(HML) + b_4(UMD) + e_{pt}$$

The four independent variables are estimated in each month. The market variable is the return on a value-weighted market index minus the risk free rate. The size variable is the return on a value-weighted portfolio of small stocks minus the return on a value-weighted portfolio of big stocks. The book to market variable is the return on a value-weighted portfolio of high book-to-market stocks less the return on a value-weighted portfolio of low book-to-market stocks. The UMD is a momentum factor computed by the average return on two high-prior-return portfolios minus the average return on two low-prior-return portfolios. The intercept is then interpreted as the average monthly abnormal return of the event portfolio across the 36 month observation period. Both ordinary least squares and weighted least squares will be used to evaluate the four-factor regression equation. The weights used in the WLS are equal to the of event firms in the monthly portfolio. The statistical significance for each monthly average stock return is tested using a parametric t-test using the White (1980) method. Each ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed test.

Panel A: Estimates of the Coefficients - Straight Bond IBO's

Intercept	*α*	*b1*	*b2*	*b3*	*b4*	*r-sq* *adj r-sq*
Investment Grade IBO's						
Weighted Least Squares	-0.88	0.14	-22.48	-4.56	0.07	0.8235
t-statistic	*-3.55****	*9.33****	*-7.34****	*-1.45**	*2.05***	0.7992
Ordinary Least Squares	-0.79	0.22	-15.49	-5.32	1.92	0.7823
t-statistic	*-2.19***	*8.74****	*-11.02****	*-2.01***	*4.85****	0.7682
Non-Investment Grade IBO's						
Weighted Least Squares	-0.93	0.17	-23.65	-4.64	1.93	0.7620
t-statistic	*-2.68****	*9.01****	*-10.92****	*-1.93****	*6.02****	0.7327
Ordinary Least Squares	-0.86	0.24	-19.45	-7.01	0.92	0.7402
t-statistic	*-3.10****	*7.83****	*-9.82****	*-1.59**	*5.21****	0.7221

Panel B: Estimates of the Coefficients - Callable Bond IBO's

Intercept	*α*	*b1*	*b2*	*b3*	*b4*	*r-sq* *adj r-sq*
Investment Grade Callable Bonds						
Weighted Least Squares	-0.94	-0.14	-19.35	4.93	0.07	0.7540
t-statistic	*-3.72****	*-10.71****	*-11.91****	*2.29***	*5.35****	0.7321
Ordinary Least Squares	-0.88	-0.23	-18.05	5.76	1.97	0.8168
t-statistic	*-2.02***	*-9.52****	*-15.31****	*2.38****	*5.76****	0.7941
Non-Investment Grade Callable Bonds						
Weighted Least Squares	-1.00	-0.17	-29.09	5.02	1.98	0.7889
t-statistic	*-4.21****	*-8.31****	*-8.71****	*1.29**	*2.84****	0.7624
Ordinary Least Squares	-0.92	-0.25	-23.92	7.59	0.94	0.7692
t-statistic	*-3.37****	*-10.88****	*-8.73****	*2.21***	*5.67****	0.7482

Table 19 - continued

Panel C: Estimates of the Coefficients - Convertible Bond IBO's

Intercept	*α*	*b1*	*b2*	*b3*	*b4*	*r-sq* / *adj r-sq*
Investment Grade Convertible Bonds						
Weighted Least Squares	-0.59	0.14	-14.23	-4.10	0.06	0.8423
t-statistic	*-3.87***	*10.46***	*-11.11***	*-2.24***	*5.57***	0.8174
Ordinary Least Squares	-0.52	0.21	-11.95	-5.16	1.98	0.8001
t-statistic	*-2.37***	*9.90***	*-14.97***	*-2.23***	*6.74***	0.7856
Non-Investment Grade Convertible Bonds						
Weighted Least Squares	-0.73	0.17	-24.20	-4.78	1.98	0.7818
t-statistic	*-3.93***	*9.72***	*-9.06***	*-1.51**	*2.66***	0.7618
Ordinary Least Squares	-0.64	0.25	-18.87	-7.17	0.89	0.7595
t-statistic	*-3.30***	*10.15***	*-10.22***	*-2.29***	*5.54***	0.7408

Over the 5-year period after issuance. These results are significant at the 99% confidence interval. In both the 3 and 5-year post issuance windows the level of underperformance is greater for the non-investment grade bond issuing firms than their investment grade counterparts. The results also suggest while the level of underperformance is lessening for investment grade issuers (0.88% at 3-years and 0.85% at 5-years), the level of underperformance is extending for the non-investment grade issuers (0.85% at 3-years and 0.97% at 5 years).

The next series of results looks at bond issues that are callable. Panel B of Table 19 lists the results of callable bond IBO's for both investment and non-investment grade bond issuers. Over the 3-year post issuance window, the stock of investment grade issuers underperforms the matching firms by 0.94% per month or 33.84%. The level of stock underperformance is slightly higher for the non-investment grade issuers at 1.00% per month or 36.00% over the period. Over the 5-year period, the investment grade firms have a slightly lower level on a monthly basis than they had in the 3 year window. Panel B of Table 20 shows the level of underperformance to be 0.87% per month or 52.20% overall. The non-investment grade issuers also have a decreased level of underperformance on a monthly basis in the

Table 20: Fama-French Four-Factor Regression Estimates - 5 Year Returns

Table 4 shows the post-announcement average monthly abnormal stock returns for event firms. These are estimated using the Fama-French calendar time portfolio regressions. Fama (1998) argues this method will overcome any statistical problems using long-term buy-and-hold returns. This is represented by equation below.

$$R_{pt} - r_{ft} = a + b_1(r_{mt} - r_{ft}) + b_2(SMB_t) + b_3(HML) + b_4(UMD) + e_{pt}$$

The four independent variables are estimated in each month. The market variable is the return on a value-weighted market index minus the risk free rate. The size variable is the return on a value-weighted portfolio of small stocks minus the return on a value-weighted portfolio of big stocks. The book to market variable is the return on a value-weighted portfolio of high book-to-market stocks less the return on a value-weighted portfolio of low book-to-market stocks. The UMD is a momentum factor computed by the average return on two high-prior-return portfolios minus the average return on two low-prior-return portfolios. The intercept is then interpreted as the average monthly abnormal return of the event portfolio across the 60 month observation period. Both ordinary least squares and weighted least squares will be used to evaluate the four-factor regression equation. The weights used in the WLS are equal to the of event firms in the monthly portfolio. The statistical significance for each monthly average stock return is tested using a parametric t-test using the White (1980) method. Each ***, **, and * denote significance at the 1, 5 and 10 percent levels, respectively, in a two-tailed test.

Panel A: Estimates of the Coefficients - Straight Bond IBO's

Intercept	*α*	*b1*	*b2*	*b3*	*b4*	*r-sq* / *adj r-sq*
Investment Grade IBO's						
Weighted Least Squares	-0.85	0.12	-13.61	-4.70	0.06	0.7522
t-statistic	*-3.23***	*7.93***	*-6.53***	*-1.34**	*1.82***	0.7403
Ordinary Least Squares	-0.70	0.20	-11.17	-4.79	1.79	0.7846
t-statistic	*-2.19***	*8.47***	*-10.02***	*-3.62***	*4.51***	0.7715
Non-Investment Grade IBO's						
Weighted Least Squares	-0.98	0.16	-22.94	-4.22	1.64	0.7587
t-statistic	*-2.41***	*8.19***	*-10.15***	*-1.87***	*5.47***	0.7414
Ordinary Least Squares	-0.93	0.21	-18.87	-6.38	0.78	0.7884
t-statistic	*-2.88***	*7.59***	*-8.93***	*-1.35**	*4.84***	0.7736

Panel B: Estimates of the Coefficients - Callable Bond IBO's

Intercept	*α*	*b1*	*b2*	*b3*	*b4*	*r-sq* / *adj r-sq*
Investment Grade Callable Bonds						
Weighted Least Squares	-0.87	-0.13	-16.89	4.59	0.06	0.7780
t-statistic	*-3.46***	*-9.09***	*-10.83***	*2.22***	*4.76***	0.7616
Ordinary Least Squares	-0.83	-0.20	-14.19	5.24	1.91	0.6746
t-statistic	*-2.25***	*-8.47***	*-13.78***	*2.02***	*5.24***	0.7263
Non-Investment Grade Callable Bonds						
Weighted Least Squares	-0.97	-0.16	-28.22	4.57	1.68	0.7610
t-statistic	*-3.79***	*-8.05***	*-7.93***	*1.29**	*2.65***	0.7482
Ordinary Least Squares	-0.80	-0.22	-20.33	7.36	0.81	0.7937
t-statistic	*-3.07***	*-9.25***	*-8.12***	*1.98***	*5.50***	0.7785

Table 19 - continued

Panel C: Estimates of the Coefficients - Convertible Bond IBO's

Intercept	*α*	*b1*	*b2*	*b3*	*b4*	*r-sq* / *adj r-sq*
Investment Grade Convertible Bonds						
Weighted Least Squares	-0.67	0.36	-16.51	-8.72	3.36	0.7844
t-statistic	*-2.45****	*10.01****	*-14.56****	*-2.25***	*6.56****	*0.7674*
Ordinary Least Squares	-0.71	0.24	-11.36	-4.25	0.11	0.7505
t-statistic	*-6.54****	*10.17****	*-11.22****	*-2.26***	*5.41****	*0.7283*
Non-Investment Grade Convertible Bonds						
Weighted Least Squares	-0.74	0.30	-24.47	-4.95	3.34	0.7905
t-statistic	*-4.07****	*9.82****	*-8.81****	*-2.56****	*2.68****	*0.7778*
Ordinary Least Squares	-0.81	0.25	-19.52	-7.25	0.87	0.7593
t-statistic	*-3.41****	*10.26****	*-9.95****	*-3.90****	*5.60****	*0.7591*

5-year window than in the 3-year window. The level of underperformance decreases to 0.97% or 58.20% for the 5-year period. It is of note that the level of stock return underperformance is lessening for both Investment-grade issuers in the 3-year to 5-year window and the non-investment grade issuers. Similar to the straight bond IBO issuers, the non-investment grade bond issuers experience a higher level of underperformance when issuing non-investment grade bonds than investment grade bonds issuers. All period results are significant at the 99% confidence level.

The last set of results in Tables 19 and 20 list the results of convertible bond IBO issuers. The intercept estimate of abnormal return for investment grade convertible bond IBO issuers is 0.59% per month or 21.24% over the 3–year period as shown in Panel C of Table 19. Panel C of Table 20 shows the 5-year level of stock return underperformance is slightly higher at 0.73% per month or 43.80% overall. Similar to the previous tests in this section, issuers of non-investment grade convertible IBO's experience a greater level of underperformance than their investment grade counterparts in both post issue periods. The average monthly abnormal return is 0.67% or 24.12% in the 3-year post issuance period as shown in Panel C of Table 19. The monthly number increases to 0.74% per month or a 44.40% level of stock underperformance in the 5-year post issue period.[52] Unlike straight and callable bonds, the level of

[52] All results presented are significant at the 99% confidence level.

underperformance is increased in the 5-year post period compared to the 3-year post period. These results are consistent to those of Affleck-Graves and Miller (2003) who provide an explanation for the deteriorating monthly abnormal return. They explain the level of underperformance is increasing because the performance of the firm is lacking behind its industry peers. They further believe this lack of performance is diminishing the stock price of the firm and the convertible feature is not presenting value to the bondholders.

4.5.3 Comparing the Results

The long-run wealth effect of newly issued debt has long been subject of academic literature. The accurate way to capture the long-run impact has been the subject of much debate. Several models have evolved to capture the long-run abnormal return, although two have risen to the forefront of the literature. Buy-and-hold returns methodology measures the level of stock return underperformance through a series of event firms being matched with firms of equal size and book-to-market value. By comparing the returns of both firms over an observation window, the level of underperformance can be determined. The Fama French Four-Factor Model is a regression featuring the T-bill return, a market premium factor, a size factor, a book-to-market factor and a momentum factor. Fama and French (1996) argue that buy-and-hold returns can provide mis-specified results due to new listing, skewness and re-listing biasness, while Barber and Lyon (1997) provide evidence to effectively test for abnormal returns (the mean return is different than zero) would be to use buy-and-hold return methodology. Both series of tests are conducted and the results are presented previously in this section.

Both models used provide the same general results, finding that bond IBO's issuing firms' stock will significantly underperform firms that do not issue stocks or bonds up to a 5-year period. This relationship holds true for both issuers of investment and non-investment grade bonds. Straight bond issuers are found to underperform matched firms by 32.69% and 54.32% in the 3 and 5-year post period after issuance using buy-and-hold return methodology. The Fama French Four-Factor model finds slightly less underperformance over the 3 and 5-year post issue periods at 31.69% and 51.00% respectively.

High-yield bond issuers of straight bond experience 38.86% and 61.38% underperformance using buy-and-hold techniques and 33.48% and 58.20% using the Fama French method over the same periods. Both models used also support the hypotheses that firms issuing high-yield bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms and high-yield bond IBO firms will exhibit greater stock price underperformance than their investment grade bond IBO issuing counterparts.

Both methods further revealed similar results for callable IBO bond issuances as with straight bond IBO issuers. The buy-and-hold method revealed stock return underperformance for investment-grade issuing firms to be 37.23% and 55.47% over the 3 and 5-year post issue periods while the French-Fama Four-Factor model has results of 33.84% and 52.20% over the 3 and 5-year post issue periods. These numbers increase to 41.28% and 63.32% using buy-and-hold methods to 36.00% and 58.20% using the four-factor model for non-investment grade issuers over the 3 and 5-year windows. Both models used also support the hypotheses that firms issuing high-yield callable bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms and firms issuing high-yield callable bond IBOs' will exhibit greater stock price underperformance than their investment grade callable bond IBO issuing counterparts.

Bonds issued with a conversion feature are the last classification of bonds evaluated. A 27.56% stock return underperformance is noted in the 3-year post issue period while 47.81% is noticed in the 5-year post issue period using buy-and-hold methodology over investment grade issuers. Using the Fama French Four-Factor model for the same period finds underperformance of 21.24% and 43.80% for investment grade, convertible bond IBO's. Non-investment grade convertible IBO's exhibit 33.87% underperformance in the 3-year post issue period and 53.21% in the 5-year post issue period using buy-and-hold returns. The Fama French Four-Factor model finds underperformance of 21.24% in the 3-year post issue period and 43.8 in the 5-year post issue period while non-investment grade issuer experienced a stock underperformance of 24.12% and 44.40% over the same periods. Similar to the previous results, both models used also support the hypothesis that firms issuing high-yield convertible bond IBOs' will

exhibit stock price underperformance compared to non-issuing stock and\or bond firms. The results further support the hypothesis that firms issuing high-yield convertible bond IBOs' will exhibit greater stock price underperformance than their investment grade callable bond IBO issuing counterparts. All the results of underperformance are statistically significant at the 99% confidence level.

4.6 Conclusion

This chapter examines bond IBO's of straight, callable and convertible bonds, and the level of stock underperformance that is associated with the issuing firms. The basis of this research is to show stock return underperformance does exist surrounding bond IBO's, and firms issuing high-yield debt will show a greater level of underperformance than their investment-grade counterparts. The results show stock return underperformance does occur for bond IBO issuing firms for a period up to five years after issuance. The results further show that issuers of convertible bond IBO's will exhibit less stock return underperformance than issuers of straight or callable bonds. This relationship also holds true for issuers of high-yield bonds. The main intent of this research was to show firms issuing high-yield bond IBO's will have a greater level of underperformance than their investment grade issuing counterparts. This relationship is proven using both buy-and-hold returns methodology and the Fama French Four-Factor model.

Chapter 5

Dissertation Conclusion

The intent for this line of research is to fill various voids in the current academic research with respect to high-yield debt. High-yield debt is often overlooked or is treated as a restriction in a database mixing both investment and non-investment grade issues. This study looks at high-yield bonds issued for the period 1985 to 2003 and provides an insight into the level of investor reaction though abnormal returns and the pricing decisions for new issuances. Chapter 2 finds statistically significant negative abnormal stock returns surround the announcement of an issuance of a HYB in the short-run and attempts to explain the significant return through a series of cross-sectional regressions. Several of the variables tested were found to be significant determinants of a CAR and support the stated hypotheses. In this chapter, I hypothesized the better the rating, the less negative the CAR. The rating of the issue is found to be of significance and supports the hypothesis. Additionally, I hypothesize the lower the issue amount, the less negative the CAR and the lower the debt ratio, the less negative the negative CAR. Both the issue amount and the debt ratio reveal significance and support their respective hypotheses. The length of the issue, first-time issuers and the age of the firm at issuance all are found to be significant variables of CARs and support their hypotheses which state; the longer the length, the less negative the CAR, bond IBO issuers will have a less negative CAR than SBO issuers and the older the firm at issuance, the less negative the CAR. Several other variables were found to be significant determinants of the CAR but did not support their stated hypotheses. These variables include the rating of the issue, bonds issued with a variable coupon rate and the current and total asset turnover ratios. Hypothesis not supported by significant variables in chapter 2 include hypotheses over market conditions, callable issues, coupon amount, exchange, use of proceeds, current ratio, total assets turnover ratio, basic earnings power ratio and the industry classification.

Chapter 3 examines whether the spread at issuance of a high-yield bond can be explained by examining various bond and firm characteristics. The results show that the coupon amount is statistically

significant in determining the spread. This evidence supports the hypothesis the higher the coupon amount, the larger the spread will be. The length of the issue is found to be statistically significant in spread determination and supports the hypothesis stating the longer the term to maturity, the larger the spread. I also find bonds with a call feature to have a statistical significance over the spread and support the hypothesis that callable bonds will have a greater spread than non-callable bonds.

It is further hypothesized the lower the credit rating, the larger the spread will be. The rating of the issue is found to be of significance and supports this statement. The final variable found to be significant in determining the spread is whether the market is in a bull or bear state. The test results support the hypothesis stating that bonds issued in bear markets will have a larger spread than bonds issued in bull markets. Several variables were found to support their hypothesis, but did reveal any statistical significance in determining the spread. These variables include: use of proceeds, issue amount, first-time issuers, age at issuance and the firm's total asset turnover, basic earning power and debt management ratios. Variables representing exchange, industry classification and the current ratio are found not be significant determinants and do not support their hypotheses.

Chapter 4 uses bond IBO's of straight, callable and convertible bonds to determine the level of stock underperformance that is associated with the issuing firms. The basis of this research is to show stock return underperformance does exist surrounding bond IBO's, and firms issuing high-yield bonds will show a greater level of underperformance than their investment-grade counterparts. Two different methods are used in academic research to measure long-run abnormal returns; Buy-and-Hold Return methodology and the Fama-French Four Factor model. I employ both techniques and find similar results using both. Both the Buy-and Hold Return methodology and the Fama-French Four-Factor model support the hypotheses that firms issuing high-yield bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms and high-yield bond IBO firms will exhibit greater stock price underperformance than their investment grade bond IBO issuing counterparts. It is also found that both test models used also support the hypotheses that firms issuing high-yield callable bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms and firms issuing

high-yield callable bond IBOs' will exhibit greater stock price underperformance than their investment grade callable bond IBO issuing counterparts. Additionally, both test models used support the hypothesis that firms issuing high-yield convertible bond IBOs' will exhibit stock price underperformance compared to non-issuing stock and\or bond firms and will have greater stock price underperformance than their investment grade callable bond IBO issuing counterparts.

These results presented in this research provide an insight into how high-yield debt offerings impact the issuing firm. The research is not without limitations. The databases selected are assumed to have true and correct information. In cases of incomplete or inaccurate information, the observation was excluded from the dataset. In general, ordinary least squares regression models can suffer from a variety of problems. Multicollinearity can be introduced into the results by having a perfectly linear relation among the variables. Regression models are said to be robust and have low noise when multicollinearity is minimized. Multicollinearity occurs when two or more variable measure the same thing. The issue is as the level of multicollinearity increases, the estimates of the coefficients are unstable and the standard errors of the coefficients will become inflated. Tests of correlation were used to assess the variables chosen and were found to be within normal tolerances. However, this does not mean a minimal amount of multicollinearity may be present in the test results. Another issue in regression models is the assumption that the error term to be of a constant variance. When heteroskedasticity is introduced into the model, it causes the estimated variance to be a biased estimator of the true variance. This will cause a violation of the assumption. Heteroskedasticity often occurs when there are large differences between the size of observations. Size of the abnormal retruns and the spread vary across each observation in the datasets. Lagrange Multiplier tests for hetereoskedasticity were conducted for each test and were found to be within acceptable limits. However, this does not mean a minimal amount of heteroskedasticity may not exist in the test results.

Measuring long-run abnormal returns has been the subject of much academic research and debate. Chapter 4 presents the argument over which method for long-run abnormal returns is more accurate. Both Buy-and-Hold Returns and the Fama-French Four-Factor models have their supporters

and critics. I employ both methods over the dataset and can draw the same general conclusions using either methodology. As long as academic researchers debate which methodology is superior, further research into these methods should be conducted.

Further research is still necessary to fully understand how high-yield bond issuances impact the financial structure of the firm. It has been learned and reconfirmed that the stock price of high-yield bond issuing firms is negatively impacted by an issuance in both the short-run and the long-run. The evidence of significant explanatory variables in this research provides a partial explanation for contributing factors of an abnormal return. Continuation of research into the pricing decision of high-yield bonds as measured by the offering spread is necessary to fully understand the pricing decision over new issues. I provide a partial explanation of the pricing decision by identifying determinants that make up the spread.

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Appendix A – Standardized Industry Classification List

Source: http://www.osha.gov/pls/imis/sic_manual.html

A. Division A: Agriculture, Forestry, And Fishing
    - Major Group 01: Agricultural Production Crops
    - Major Group 02: Agriculture production livestock and animal specialties
    - Major Group 07: Agricultural Services
    - Major Group 08: Forestry
    - Major Group 09: Fishing, hunting, and trapping

B. Division B: Mining
    - Major Group 10: Metal Mining
    - Major Group 12: Coal Mining
    - Major Group 13: Oil And Gas Extraction
    - Major Group 14: Mining And Quarrying Of Nonmetallic Minerals, Except Fuels

C. Division C: Construction
    - Major Group 15: Building Construction General Contractors And Operative Builders
    - Major Group 16: Heavy Construction Other Than Building Construction Contractors
    - Major Group 17: Construction Special Trade Contractors

D. Division D: Manufacturing
    - Major Group 20: Food And Kindred Products
    - Major Group 21: Tobacco Products
    - Major Group 22: Textile Mill Products
    - Major Group 23: Apparel And Other Finished Products Made From Fabrics And Similar Materials
    - Major Group 24: Lumber And Wood Products, Except Furniture
    - Major Group 25: Furniture And Fixtures
    - Major Group 26: Paper And Allied Products
    - Major Group 27: Printing, Publishing, And Allied Industries
    - Major Group 28: Chemicals And Allied Products
    - Major Group 29: Petroleum Refining And Related Industries
    - Major Group 30: Rubber And Miscellaneous Plastics Products
    - Major Group 31: Leather And Leather Products
    - Major Group 32: Stone, Clay, Glass, And Concrete Products
    - Major Group 33: Primary Metal Industries
    - Major Group 34: Fabricated Metal Products, Except Machinery And Transportation Equipment
    - Major Group 35: Industrial And Commercial Machinery And Computer Equipment
    - Major Group 36: Electronic And Other Electrical Equipment And Components, Except Computer Equipment
    - Major Group 37: Transportation Equipment
    - Major Group 38: Measuring, Analyzing, And Controlling Instruments; Photographic, Medical And Optical Goods; Watches And Clocks
    - Major Group 39: Miscellaneous Manufacturing Industries

E. Division E: Transportation, Communications, Electric, Gas, And Sanitary Services
    - Major Group 40: Railroad Transportation
    - Major Group 41: Local And Suburban Transit And Interurban Highway Passenger Transportation
    - Major Group 42: Motor Freight Transportation And Warehousing
    - Major Group 43: United States Postal Service
    - Major Group 44: Water Transportation
    - Major Group 45: Transportation By Air
    - Major Group 46: Pipelines, Except Natural Gas
    - Major Group 47: Transportation Services
    - Major Group 48: Communications
    - Major Group 49: Electric, Gas, And Sanitary Services
F. Division F: Wholesale Trade
    - Major Group 50: Wholesale Trade-durable Goods
    - Major Group 51: Wholesale Trade-non-durable Goods
G. Division G: Retail Trade
    - Major Group 52: Building Materials, Hardware, Garden Supply, And Mobile Home Dealers
    - Major Group 53: General Merchandise Stores
    - Major Group 54: Food Stores
    - Major Group 55: Automotive Dealers And Gasoline Service Stations
    - Major Group 56: Apparel And Accessory Stores
    - Major Group 57: Home Furniture, Furnishings, And Equipment Stores
    - Major Group 58: Eating And Drinking Places
    - Major Group 59: Miscellaneous Retail
H. Division H: Finance, Insurance, And Real Estate
    - Major Group 60: Depository Institutions
    - Major Group 61: Non-depository Credit Institutions
    - Major Group 62: Security And Commodity Brokers, Dealers, Exchanges, And Services
    - Major Group 63: Insurance Carriers
    - Major Group 64: Insurance Agents, Brokers, And Service
    - Major Group 65: Real Estate
    - Major Group 67: Holding And Other Investment Offices
I. Division I: Services
    - Major Group 70: Hotels, Rooming Houses, Camps, And Other Lodging Places
    - Major Group 72: Personal Services
    - Major Group 73: Business Services
    - Major Group 75: Automotive Repair, Services, And Parking
    - Major Group 76: Miscellaneous Repair Services
    - Major Group 78: Motion Pictures
    - Major Group 79: Amusement And Recreation Services
    - Major Group 80: Health Services
    - Major Group 81: Legal Services
    - Major Group 82: Educational Services
    - Major Group 83: Social Services
    - Major Group 84: Museums, Art Galleries, And Botanical And Zoological Gardens
    - Major Group 86: Membership Organizations
    - Major Group 87: Engineering, Accounting, Research, Management, And Related Services

Major Group 88: Private Households

Major Group 89: Miscellaneous Services

J. Division J: Public Administration

Major Group 91: Executive, Legislative, And General Government, Except Finance

Major Group 92: Justice, Public Order, And Safety

Major Group 93: Public Finance, Taxation, And Monetary Policy

Major Group 94: Administration Of Human Resource Programs

Major Group 95: Administration Of Environmental Quality And Housing Programs

Major Group 96: Administration Of Economic Programs

Major Group 97: National Security And International Affairs

Major Group 99: Nonclassifiable Establishments

VITA

David Wolfe grew up in Cape Coral, FL and graduated Cape Coral High School in 1987. After working as an electrician for several years, David completed a B.S.B.A in Business, majoring in Business Economics from the University of Central Florida in Orlando, FL in 1997. After graduation, he continued his educational path earning a Masters of Business Administration (M.B.A.) from Stetson University in DeLand, FL in 1998. David entered the University of New Orleans in 2001 to pursue a doctorate degree in financial economics after a few years in corporate industry. David completed his Ph.D. in Financial Economics in August 2006 and has accepted an employment offer as an Assistant Professor of Finance at Fayetteville State University in Fayetteville, NC.